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BLOCKCHAIN TECHNOLOGY TRANSFORMATION IN THE E-COMMERCE MARKETING STRATEGY OF SMeS

TRANSFORMASI TEKNOLOGY BLOCKCHAIN PADA STRATEGY PEMASARAN ECOMMERCE

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Abstrak

Penelitian ini bertujuan untuk mengidentifikasi pengaruh transformasi teknologi blockchain dalam strategi pemasaran e-commerce UMKM di Kota Bengkulu. Blockchain telah mengubah e-commerce dengan meningkatkan keamanan transaksi, transparansi operasional, dan efisiensi. Teknologi ini membangun kepercayaan konsumen dan meningkatkan loyalitas pelanggan. Karakteristik blockchain yang terdesentralisasi menciptakan pasar digital yang lebih terbuka, mengurangi ketergantungan pada perantara tradisional. Penelitian ini menggunakan metodologi kuantitatif dengan teknik survei untuk mengumpulkan data dari UKM di Kota Bengkulu. Penerapan blockchain dalam e-commerce tidak hanya meningkatkan keamanan dan transparansi tetapi juga memperkuat hubungan konsumen dan membangun citra merek yang inovatif dan aman. Studi ini menyoroti pentingnya transparansi risiko dalam meningkatkan kepercayaan konsumen dan efektivitas strategi pemasaran.

Keywords: blockchain, ecommerce, strategi marketing

Abstract

This research aims to identify the influence of blockchain technology transformation in the e-commerce marketing strategy of MSMEs in Bengkulu City. Blockchain has transformed e-commerce by improving transaction security, operational transparency, and efficiency. This technology builds consumer trust and increases customer loyalty. The decentralized characteristics of blockchain create a more open digital marketplace, reducing dependence on traditional intermediaries. This research uses quantitative methodology with a survey technique to collect data from SMEs in Bengkulu City. The implementation of blockchain in e-commerce not only improves security and transparency but also strengthens consumer relationships and builds an innovative and secure brand image. This study highlights the importance of risk transparency in increasing consumer trust and the effectiveness of marketing strategies.

Keywords*:* blockchain, ecommerce, marketing strategy

INTRODUCTION

Digital transformation has become a key factor in the design of marketing strategies, especially in the field of e-commerce as noted byAvira et al., (2023); & Uribe-Linares et al., (2023). In the digital marketing environment, e-commerce has changed how consumers interact with businesses and operations significantly. Deng (2022) says that electronic commerce has dramatically impacted the digital economy, thereby speeding up the digitization of the industrialization process, business operations and social progress. Despite this, many customers today find many challenges when they try to shop online, including easy access to products, comparing prices, and promotional offers apart from any other benefit for enterprises simply due

(Palanisamy, 2022). E-commerce involves several activities like purchase, sale and exchange of information over networks, which in turn reduce costs associated with operating round-clock services as well as extending markets worldwide (David K et al., 2023; Kedah, 2023). Hence, in order to survive in this fast-paced world where consumer behaviour changes daily due to high competition then, e-commerce enterprises need to be innovative enough to satisfy customers' needs, increase market share through customer satisfaction, and improve operational efficiencies.

Blockchain technology has revolutionized various sectors of our economy, including digital economies, ensuring secure transactions processing data science applications as well as decentralization of control (Gu, 2023; Hameed & Al-Alak, 2023; Mohammed & Hashim, 2023). In the supply chain industry, blockchain promises to transform current practices by improving visibility and transparency in transactions (Litoussi et al., 2023). Therefore, we can say that when this technology is implemented, it becomes possible for us to achieve reliable systems through consensus algorithms, decentralized models, as well as peer-to-peer networks(Mohammed & Hashim, 2023). Additionally, it has been proven that this technology can minimize operating costs without compromising safety and transparency, which makes it an attractive proposition for a wide range of industries looking to improve their operational efficiency while at the same time fostering greater transparency in their systems.

Blockchain first meant cryptocurrency, but now it is all about transparency, security, and reliability in e-commerce. It can help solve trust issues between marketers and customers, data integrity concerns as well as reduce costs related to e-commerce marketing running expenses over time(Zhou & Verburg, 2023). Nevertheless, the uptake remains low since more studies need to be carried out to investigate its impact on e-commerce integration. This research is crucial because it focuses mainly on how blockchain could better performance levels of competitiveness; therefore, this study would be concerned with digital transformation marketing, developments in e-commerce, challenges related to implementing blockchain into e-commerce marketing.

In Bengkulu City, micro, small, and medium-sized enterprises (MSMEs) require proper marketing strategies to increase their competitiveness in the market. The unmatched appeal of using innovation to communicate directly with consumers has always been attractive to marketing managers. The effectiveness of marketing in the digital era has relied heavily on Social Media websites, which include but are not limited to Twitter, Facebook, Instagram, and LinkedIn, among other platforms where brands communicate promotional messages to potential customers for products and services that they offer. This can be attributed to the observed increase in the number of internet users worldwide; hence, companies targeting this market should take advantage of such outlets to increase product awareness among customers who use them (Cahyono, 2018).

THEORETICAL REVIEW

Blockchain dan E-Commerce

In recent years, blockchain technology has gained significant attention due to its potential to disrupt various sectors of the economy, including e-commerce. With its decentralised and transparent nature, blockchain has the potential to revolutionise the e-commerce industry by addressing some of its key challenges (Hofman & Brewster, 2019). These challenges include trust,

security, and transparency in transactions. By implementing blockchain technology in e-commerce, the issue of trust can be addressed as the entire transaction history is recorded and cannot be altered (Zaghloul et al., 2020) . In addition, using smart contracts in blockchain can automate and streamline e-commerce processes, reducing the need for intermediaries and increasing efficiency.

Furthermore, blockchain technology can provide transparency in e-commerce by allowing customers to trace and verify the origin and authenticity of products. By utilising blockchain technology in e-commerce, businesses can ensure that their customers are provided with accurate and trustworthy information about the products they purchase. Accurate and reliable weather forecasts cannot be overstated in today's rapidly changing world. Blockchain technology can potentially revolutionise e-commerce by addressing key challenges such as trust, security, and transaction transparency (Guo et al., 2022). Blockchain technology can potentially revolutionise e-commerce by addressing key challenges such as trust, security, and transaction transparency (Zhang et al., 2024). In addition, integrating blockchain technology in e-commerce can also address issues related to supply chain management (Chen et al., 2022).

H1 : Blockchain technology has a positive effect on e-commerce marketing strategy.

Blockchain dan Loyalties

Blockchain technology has gained significant attention and usage in various industries, including digital marketing. This technology has the potential to revolutionise loyalty programmes by providing a secure and transparent platform to track and reward customer loyalty; by utilising blockchain technology, loyalty programmes can eliminate issues such as fraud, double-spending, and data manipulation (Sonmezturk et al., 2020). In addition, blockchain can enable interoperability between different loyalty programmes, allowing customers to earn and redeem rewards seamlessly across different brands. This will improve the overall customer experience and loyalty, as customers will have more flexibility and choice in using their rewards. Blockchain technology can also improve the transparency and accountability of loyalty programmes. Customers will have access to a complete and immutable record of their loyalty transactions, ensuring they are rewarded accurately and fairly (Agrawal et al., 2019). Overall, blockchain technology has the potential to revolutionise loyalty programs by improving security, transparency, and interoperability. In addition, the use of blockchain technology in loyalty programmes can also address trust and transparency issues; by leveraging intelligent contracts on the blockchain, businesses can create loyalty programmes that automatically execute rewards and incentives based on preset rules, thereby eliminating the need for intermediaries and reducing administrative costs, making loyalty programmes more efficient and cost-effective. In addition, blockchain technology can also give customers more control and ownership over their loyalty data; they can choose to share their data with specific brands or organisations, giving them greater control and privacy (Henriques et al., 2024)

H2 : Blockchain technology has a positive effect on loyalty
H3 : Customer loyalty has a positive effect on ecommerce marketing strategies

Risk dan transparency

Privacy is another important issue, as transactions on public blockchains are transparent and traceable, which can compromise user privacy. Data on a blockchain cannot be changed or deleted, which can be problematic if sensitive information is accidentally recorded. Scalability issues are also a challenge, as blockchains such as Bitcoin and Ethereum can only process a certain number of transactions per second, leading to congestion and high fees when demand is high(Croman et al., 2016). In addition, storage requirements for nodes continue to increase as blockchains grow, which could hinder widespread adoption.

Second-layer solutions such as Lightning Network for Bitcoin or Plasma for Ethereum, as well as sharding techniques to divide the blockchain into smaller parts, can address scalability issues. In terms of operational safety, secure key management, the use of hardware wallets, and backup mechanisms for critical components of the blockchain infrastructure are essential (Atzei et al., 2017). By understanding and addressing these risks and implementing best practices for safety, users and organisations can maximise the benefits of blockchain technology while minimising the potential downsides.

H5 : risk and transparency affect e-commerce strategy
H4 : risk and transparency affect lockchain technology

Trust dan safety

Trust and security are crucial in e-commerce marketing strategies, and blockchain technology offers a powerful solution to enhance these aspects. Blockchain's inherent characteristics of transparency, traceability, and immutability can significantly increase consumer trust by ensuring product authenticity and security (Gazzola et al., 2023a).

The global transformation towards digital interactions underscores the need for secure and trustworthy systems, and blockchain is at the forefront of this change (Roselinkiruba & Sharmila, 2017). In the context of small and medium-sized enterprises (SMEs), blockchain fosters a collaborative environment by ensuring transparency, accountability, and trust, which are critical for the smooth functioning and sustainability of e-commerce clusters(Kumbhakar et al., 2023). By utilising blockchain technology, e-commerce platforms can create a secure, transparent and trustworthy environment that increases consumer confidence and ensures the safety and authenticity of products and transactions.

H6 : Trust and safety have a positive effect on consumer loyalty
H7 : Trust and safety have a positive effect on risk transparency

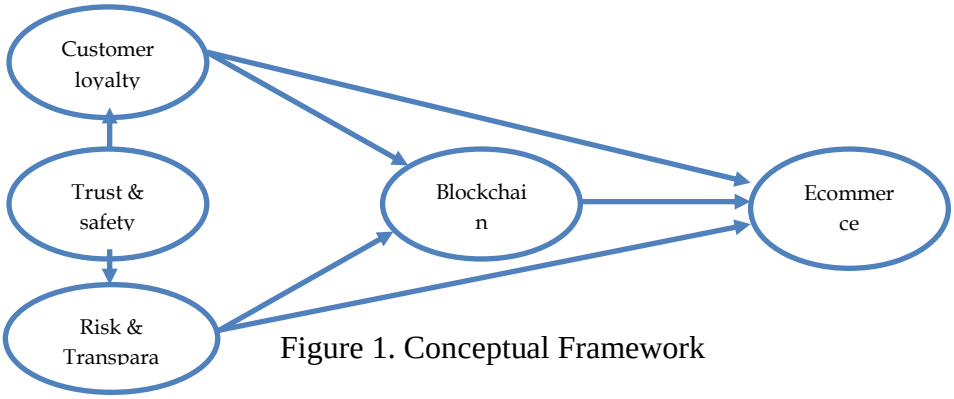

Figure 1. Conceptual Framework

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METHODOLOGY

This investigation employs a quantitative methodology utilizing survey and explanatory research techniques. The survey approach entails collecting data from participants through predetermined inquiries, aiming to gather quantitative data on the population's attitudes, opinions, behaviours, or other attributes. Surveys may be executed via observations, surveys, or interviews.

The study's population comprised MSMEs in Bengkulu City, with a subset drawn from a small percentage of individuals or elements of the population for observation or measurement; in this instance, the sample size was 136. Primary data was acquired directly from participants by disseminating surveys to MSMEs and compiling pertinent client documents. The research tool underwent testing to ensure its adherence to the criteria of a reliable measuring device, the data has been collected, it will be analysed by using SmartPLS 4 software.

RESULTS

The methodology employed in this research utilizes path analysis with the support of smart PLS 4.0 software. This particular software plays a pivotal role in managing substantial datasets to examine the research analysis through the utilization of the measurement model.

Table 3.1 validity test

	Blockchain	Customer Loyalty	Ecommerce	Risk & Transparancy	Trust & Safety
x1.2		0.686			
x1.3		0.635			
x1.4		0.768			
x1.5		0.792			
x2.1					0.733
x2.2					0.692
x2.3					0.722
x2.4					0.787
x2.5					0.785
x3.1	0.722				
x3.2	0.688				
x3.3	0.811				
x3.4	0.742				
x3.5	0.794				
x4.1			0.818		
x4.2			0.868		
x4.3			0.669		
x4.4			0.710		
y2.2				0.711	
y3.3				0.656	
y4.4				0.795	
y5.5				0.708	

Source : adapted SmartPlS output (2024)

These results show that each indicator in each variable has a reasonably high correlation value with the primary variable under study. The high correlation value indicates that these indicators are relevant and significant in measuring these variables.

Tabel 3.2 Reliability test

	Cronbach's alpha	Composite reliability (rho_a)
Blockchain	0.808	0.817
Customer Loyalty	0.697	0.716
Ecommerce	0.766	0.774
Risk & Transparancy	0.686	0.689
Trust & Safety	0.802	0.811

Source : adapted SmartPlS output (2024)

The Cronbach's alpha and composite reliability coefficients of all variables demonstrate strong reliability. Scores exceeding 0.70 suggest that the measurement scales employed in this research exhibit robustness and dependability.

Table 3.3 Hypothesis Test

	Effect size	S.DEV	T	P values
Blockchain -> Ecommerce	0.577	0.090	6.425	0.000
Customer Loyalty -> Blockchain	0.416	0.067	6.221	0.000
Customer Loyalty -> Ecommerce	-0.026	0.096	0.273	0.785
Risk & Transparancy -> Blockchain	0.426	0.072	5.892	0.000
Risk & Transparancy -> Ecommerce	0.274	0.078	3.528	0.000
Trust & Safety -> Customer Loyalty	0.668	0.047	14.094	0.000
Trust & Safety -> Risk & Transparancy	0.621	0.074	8.433	0.000

Source : adapted SmartPlS output (2024)

H1 Accepted: the results show a significant relationship between the blockchain variable (which may be a particular variable or index) and the e-commerce variable (which may also be another index or variable). The high value of T statistics (6.425) indicates that the difference between the sample mean (M) and the original sample value (O) is much more significant than the expected variability in the sample. The very low p-value (0.000) indicates that this result is highly statistically significant, so we can reject the null hypothesis and accept the alternative hypothesis that there is a substantial relationship between blockchain and e-commerce.

H2 Accepted: The results show a significant relationship between the customer loyalty variable and blockchain. The high T statistics (6.221) and very low p-value (0.000) confirm that the difference between the sample mean and the original sample value for customer loyalty with blockchain is also statistically significant.

H3 Rejected: The results show no significant relationship between the customer loyalty variable and blockchain. The T statistic (0.273) is low, and the p-value (0.785) is greater than the commonly used significance level (usually 0.05), so it is not strong enough to reject the null hypothesis. This indicates that the difference between the sample mean and the original sample value for customer loyalty with blockchain is not statistically significant.

H4 accepted: The results show a significant relationship between risk and safety variables and blockchain. The high T statistics (5.892) and very low p-value (0.000) indicate that the difference between the sample mean and original values for RS and BAI is statistically significant.

H5 is accepted: These results indicate a significant relationship between risk and safety variables and e-commerce. The high T statistics (3.528) and very low p-value (0.000) confirm that the difference between the sample mean and original sample values for risk and safety with e-commerce is also statistically significant.

H6 is accepted. This result shows a highly significant relationship between the transparency variable and customer loyalty. The very high T statistics (14.094) and very low p-value (0.000) indicate that the difference between the sample mean and the original sample value for transparency and customer loyalty is much greater than the expected variability in the sample, so this relationship is statistically significant.

H7 is accepted. This result indicates a significant relationship between the transparency variable and risk and safety. The high T statistics (8.433) and very low p-value (0.000) confirm that the difference between the sample mean and original sample values for transparency with risk and safety is also statistically significant.

DISCUSSION

The potential of blockchain technology to transform e-commerce through improved consumer trust, operational efficiency, and overall market competitiveness is immense. Blockchain technology is known for its security, transparency, and efficiency. Blockchain's provision of secure and unchangeable transaction records creates a reliable atmosphere for consumers, enhancing their connection to products and brands. Trust is essential for cultivating robust customer connections and distinguishing oneself from rivals (Anam Chairul, 2024; Sunarya & Perdana, 2023). Building consumer trust is facilitated by being open and honest about risks, including data security and shipping conditions. Effective dissemination of potential hazards and measures to minimize their impact contributes to establishing a favorable public image and customer allegiance (Mohamed et al., 2023; Tejedo-Romero & Ferraz Esteves Araujo, 2023).

Smart contracts can be created automatically and securely with blockchain, lowering administrative costs and accelerating transactions (Finger, 2023). Adopting blockchain technology can enable companies to guarantee data security and safeguard user privacy, thereby enhancing consumer trust and satisfaction (Nikmah et al., 2023). Blockchain technology enables improved data security and transparency, facilitating the implementation of highly tailored marketing strategies. Platforms that have gained consumers' trust are more likely to receive accurate personal information. This allows companies to customize their messages and offers effectively, (Gazzola et al., 2023b). By incorporating the advantages of blockchain technology into marketing strategies, e-commerce platforms can establish a reputation for being cutting-edge and reliable, attracting a more extensive customer base and garnering increased interest from investors, (Hermansyah & Astini, 2024).

Utilizing blockchain technology enables the monitoring and tracing of products, thereby improving the transparency of supply chains. This, in turn, fosters consumer confidence and trust in the system, (Grimmelikhuijsen et al., 2024). Enhancing the visibility of risks enables adherence to regulations, decreasing the expenses associated with compliance and faster adoption of blockchain technology, (Zavalis et al., 2023). Utilizing blockchain technology can result in

enhanced customer loyalty and improved retention rates due to the heightened security and trust it offers (Huang et al., 2023). Adopting blockchain technology is a prudent decision for ensuring a business's long-term viability and expansion, as it enhances operational effectiveness and facilitates efficient data management, (Faccia et al., 2023).

In order to ensure fair data practices, it is crucial to address ethical considerations and potential vulnerabilities in digital strategies despite the significant advantages offered by blockchain technology(Read & Smith, 2023) . Companies face the task of successfully incorporating blockchain technology into their current systems and ensuring that technical and non-technical stakeholders comprehend its advantages and consequences. Integrating blockchain technology in e-commerce provides several advantages, such as improved security, transparency, and operational efficiency. Blockchain has the potential to promote consumer trust and enhance data management, leading to substantial growth and a competitive edge in the digital marketplace. Nevertheless, achieving successful adoption necessitates careful examination and resolution of ethical concerns, guaranteeing adherence to regulatory standards, and surmounting obstacles related to integration.

FURTHER STUDY

Blockchain technology significantly influences e-commerce performance, especially for MSMEs in Bengkulu City. Further research is needed to explore implementation and impact areas. Future studies should broaden geographical coverage to test results across different regions and economic characteristics, providing insights into universal blockchain benefits in e-commerce. Long-term research is required to deeply understand blockchain's impact on e-commerce performance, including benefits, challenges evolution, and company adaptations. Further studies are necessary to identify and address hindering factors in blockchain adoption by MSMEs, like regulatory issues and implementation costs. Exploring blockchain integration with AI, IoT, and big data can enhance e-commerce efficiency. Analyzing the social and economic impacts of blockchain adoption, such as effects on employment and education and reducing economic disparities through digital market access, is crucial.

Comparing blockchain with other e-commerce technologies can reveal their pros and cons. Detailed case studies on successful blockchain adoption by MSMEs can offer practical guidance for other businesses. Evaluating the environmental impact of blockchain use, including energy consumption and seeking sustainable solutions, is essential for further research.

Security is a crucial concern, requiring in-depth study on blockchain-related security risks and cyberattacks. Policy evaluations are needed to understand how policies at different levels affect blockchain adoption in e-commerce. These studies can comprehensively understand blockchain adoption challenges and potential in e-commerce, improving business performance and global competitiveness.

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