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Effects of Blockchain Integration on SMEs' Accounting Accuracy and Fraud Prevention: An Empirical Analysis

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ABSTRACT

This study empirically examined the effects of blockchain integration on SMEs' accounting accuracy and fraud prevention. The study specifically investigated whether the adoption of blockchain-based accounting systems improves the reliability of financial records and reduces fraudulent financial practices among Small and Medium-Sized Enterprises (SMEs). The study adopted a quantitative research design and utilized primary data collected through structured questionnaires administered to SME managers, accountants, and financial officers. A sample of 150 respondents was selected using a simple random sampling technique. Data collected were analyzed using descriptive statistics, correlation analysis, and Ordinary Least Squares (OLS) regression techniques. The results of the analysis revealed that blockchain integration has a positive and statistically significant effect on accounting accuracy among SMEs. The findings also indicated that blockchain technology significantly enhances fraud prevention mechanisms by improving transparency, traceability, and security of financial transactions. The correlation results.

Keywords: *Blockchain integration, SME, accounting accuracy, fraud prevention*

1. INTRODUCTION

The rapid advancement of digital technologies has significantly transformed accounting and financial management systems across organizations. Among these innovations, blockchain technology has emerged as a reliable tool capable of improving financial transparency, data security, and transaction efficiency. Technological innovation has transformed financial reporting and accounting systems across organizations worldwide. Traditional accounting systems often face challenges such as data manipulation, inaccurate financial reporting, and fraud, particularly within Small and Medium-Sized Enterprises (SMEs). SMEs play a significant role in economic growth by contributing to employment generation, innovation,

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and industrial development (Adejumo & Ogburie, 2024). However, many SMEs still rely on conventional accounting systems that are vulnerable to errors and fraudulent practices.

Blockchain technology has emerged as a disruptive innovation capable of addressing these challenges. Blockchain is a distributed digital ledger that records transactions in a secure, transparent, and immutable manner. Unlike traditional accounting databases that rely on centralized control, blockchain operates through decentralized networks where transactions are validated through consensus mechanisms (AlSaqa et al. (2019). The integration of blockchain into accounting systems allows financial transactions to be recorded in real time and stored permanently in a tamper-proof ledger. This feature significantly improves the accuracy of financial records and reduces the possibility of manipulation. Furthermore, blockchain provides a transparent audit trail that enables auditors and regulators to track financial transactions easily.

In recent years, scholars and practitioners have emphasized the potential of blockchain technology to transform accounting and auditing practices. Blockchain-based accounting systems can reduce human errors, automate reconciliation processes, and strengthen internal controls against financial fraud. For SMEs, which often lack sophisticated internal control mechanisms, blockchain adoption can significantly enhance financial accountability and transparency. Despite these potential benefits, empirical evidence on the effects of blockchain integration on SMEs' accounting accuracy and fraud prevention remains limited, especially in developing economies (Bozkus Kahyaoglu & Aksoy, 2021). This study therefore seeks to provide empirical evidence on how blockchain adoption influences accounting accuracy and fraud prevention among SMEs.

Blockchain technology refers to a decentralized digital ledger system that records transactions across multiple computers in a secure and transparent manner. Each transaction is stored in blocks that are linked together using cryptographic techniques. Once recorded, these transactions cannot easily be altered, making the system highly secure and reliable. In the context of accounting, blockchain technology enables organizations to maintain transparent and tamper-proof financial records (Bozkus, Kahyaoglu & Aksoy, 2021). Blockchain integration refers to the incorporation of blockchain technology into an organization's existing accounting and financial management systems. It involves using blockchain-based platforms to record, verify, and store financial transactions in a distributed ledger. Through blockchain integration, businesses can automate financial processes, improve transaction verification, and enhance data security.

Accounting refers to the systematic process of recording, classifying, summarizing, and reporting financial transactions of an organization. The primary objective of accounting is to provide relevant and reliable financial information that assists management, investors, and other stakeholders in making informed economic decisions (Ostapowicz & Żbikowski, 2019). Accounting accuracy refers to the correctness, reliability, and completeness of

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financial records and reports. Accurate accounting ensures that financial statements reflect the true financial position and performance of an organization. Blockchain technology improves accounting accuracy by providing automated transaction recording and immutable financial records (Huang, 2023).

Fraud refers to intentional acts of deception carried out to obtain financial or personal gain through illegal or unethical means. In accounting and financial management, fraud may involve falsification of financial records, embezzlement of funds, or manipulation of financial statements (Ghandehari, Hamzeh & Yazdi, 2024). Fraud prevention refers to the strategies, systems, and internal controls implemented by organizations to detect, reduce, and eliminate fraudulent activities. Effective fraud prevention mechanisms include transparent financial reporting, strong internal control systems, and advanced technological tools such as blockchain-based accounting systems (Georgiou, Sapuric, Lois & Thrassou, 2024).

Financial transparency refers to the openness and clarity with which financial information is disclosed to stakeholders. Transparent financial systems enable stakeholders to access reliable financial data, which improves accountability and trust in business operations (Ekokotu & Ofor, 2025). Smart contracts are self-executing digital agreements stored on a blockchain network. These contracts automatically execute specific actions once predetermined conditions are met. In accounting systems, smart contracts can automate financial transactions, ensure compliance with financial rules, and reduce the risk of fraud (Idehen & Mayor, 2021). Idehen and Mayor (2021) indicated that blockchain technology enhances transparency, traceability, and security in financial transactions, which significantly reduces the risk of financial fraud in SMEs.

Mirza (2024) found that blockchain technology significantly improves the accuracy and reliability of financial records through its decentralized ledger system. The results further revealed that blockchain enhances transparency in financial reporting and reduces the likelihood of financial manipulation and fraud. Sidabutar et al. (2025) findings indicated that blockchain technology improves fraud detection by providing decentralized data security, transparent transaction records, and real-time auditing mechanisms. Ekokotu and Ofor (2025) investigated the relationship between blockchain technology and fraud mitigation in Nigerian supply chain management firms. The findings showed that blockchain technology flexibility and adaptability have a significant positive effect on fraud mitigation in organizations.

Adejumo and Ogburie (2024) examined the effectiveness of blockchain technology in preventing financial fraud in accounting and finance systems. The study adopted a conceptual and analytical research approach and found that blockchain's decentralized and immutable structure strengthens financial transparency and security. Sidabutar et al. (2025) found that blockchain significantly improves data transparency, financial accountability,

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and operational efficiency in accounting systems. The results also revealed that blockchain technology strengthens fraud prevention by providing an immutable audit trail and real-time transaction verification. Georgiou et al. (2024) revealed that blockchain technology improves accounting processes by ensuring secure transaction recording, automated verification, and enhanced audit transparency. They also noted that blockchain-based accounting systems reduce fraud risk because financial transactions are recorded permanently and cannot be manipulated without network consensus.

Theoretical Framework

Several theories have been postulated to explain Blockchain Integration to SMEs' Accounting Accuracy and Fraud Prevention. These theories are as explained below.

1. Innovation Diffusion Theory

The Innovation Diffusion Theory was postulated by Everett M. Rogers (1962). The theory explains how new technologies, ideas, or innovations spread within organizations and societies over time. According to Rogers (1962), the adoption of innovation depends on factors such as perceived usefulness, compatibility with existing systems, complexity, trialability, and observability. In the context of this study, blockchain technology represents an innovation in accounting systems. SMEs adopt blockchain-based accounting platforms when they perceive that the technology will improve financial record accuracy, transparency, and security. The theory helps explain the rate and extent to which SMEs integrate blockchain technology into their accounting systems. Relevance of this theory to this paper is that it explains why SMEs adopt blockchain technology in their accounting processes to enhance financial reporting accuracy and reduce fraud.

2. Technology Acceptance Model (TAM)

The Technology Acceptance Model by Fred Davis (1989). It explains how users come to accept and use new technologies. According to Davis (1989), the adoption of technology depends mainly on two factors:

(a) Perceived relevance of the theory to this paper is that it explains the degree to which a person believes that using a particular technology will improve job performance.
(b) Perceived ease of use – the extent to which the technology is easy to understand and operate.

Within SMEs, accountants and managers are more likely to adopt blockchain systems if they believe that the technology improves accounting accuracy, simplifies financial reporting, and strengthens fraud prevention mechanisms. Its relevance to the study is that the model helps explain the behavioral factors influencing the adoption of blockchain-based accounting systems by SMEs (Zheng et al., 2017).

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3. Agency Theory

This theory is propounded by Michael C. Jensen and William H. Meckling (1976). Agency Theory explains the relationship between principals (owners or shareholders) and agents (managers) who are responsible for managing business operations. The theory suggests that conflicts of interest may arise when managers pursue personal interests instead of the interests of owners. In accounting systems, information asymmetry between owners and managers may lead to financial manipulation or fraudulent activities. Blockchain technology reduces these problems by ensuring transparency and providing an immutable record of financial transactions. Its relevance to the Study is that Blockchain technology improves financial transparency and reduces information asymmetry, thereby minimizing opportunities for managerial fraud in SMEs.

4. Fraud Triangle Theory

However, this study is anchored on Fraud triangle theory Propounded by Donald Cressey (1953). The Theory explains the three main factors that lead to fraudulent behavior within organizations. These factors include:

1. Pressure – financial or personal pressures that motivate individuals to commit fraud.
2. Opportunity – weaknesses in internal control systems that allow fraud to occur.
3. Rationalization – the justification individuals give for committing fraudulent acts.

Blockchain technology reduces the opportunity for fraud by strengthening internal controls, providing transparent financial records, and enabling real-time auditing.

Relevance to the Study is that the theory explains how blockchain integration can reduce opportunities for financial fraud in SMEs by improving transaction monitoring and strengthening accounting systems.

Statement of the Problem

SMEs often encounter significant challenges in maintaining accurate financial records and preventing fraudulent activities. Traditional accounting systems rely heavily on manual processes and centralized databases, which are vulnerable to manipulation, human error, and unauthorized access. These weaknesses may lead to inaccurate financial reporting, mismanagement of resources, and increased financial fraud. In many SMEs, weak internal control systems and limited auditing mechanisms further increase the risk of financial irregularities. Fraudulent activities such as falsification of records, unauthorized transactions, and financial misrepresentation can significantly damage business performance and stakeholder confidence (Chen, 2022).

Blockchain technology offers potential solutions to these challenges by providing a decentralized, transparent, and immutable accounting framework. Through distributed

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ledger systems and smart contracts, blockchain can automate accounting processes and provide reliable financial information (Dai, Wang & Vasarhelyi, 2017).

In spite of the theoretical benefits of blockchain technology, empirical studies examining its impact on accounting accuracy and fraud prevention in SMEs remain scarce. This study therefore seeks to fill this gap by investigating the empirical effects of blockchain integration on SMEs' accounting accuracy and fraud prevention.

Objectives of the Study

The main objective of this study is to examine the effects of blockchain integration on SMEs' accounting accuracy and fraud prevention.

The specific objectives are to:

1. Examine the effect of blockchain integration on accounting accuracy among SMEs.
2. Investigate the effect of blockchain integration on fraud prevention in SMEs.
3. Determine the relationship between blockchain-based accounting systems and financial transparency in SMEs.

Research Hypotheses

$H_0$1: Blockchain integration has no significant effect on accounting accuracy among SMEs.
$H_0$2: Blockchain integration has no significant effect on fraud prevention among SMEs.

METHOD

Model Specification

Model specification explains the mathematical relationship between the dependent variables and the independent variable used in the study. In this research, the study examines the effect of blockchain integration on accounting accuracy and fraud prevention among Small and Medium-Sized Enterprises (SMEs).

Functional Model

The functional relationship among the variables of the study is expressed as follows:

Accounting Accuracy = f (Blockchain Integration)

Fraud Prevention = f (Blockchain Integration)

Where:

- Accounting Accuracy (AA) = Reliability and correctness of financial records
- Fraud Prevention (FP) = Reduction or control of fraudulent financial activities
- Blockchain Integration (BCI) = Adoption of blockchain-based accounting systems

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Econometric Model

The econometric models for the study are specified as follows:

Model 1

$AA = \beta_0 + \beta_1 BCI + \varepsilon$

Model 2

$FP = \beta_0 + \beta_1 BCI + \varepsilon$

Where:

AA = Accounting Accuracy (Dependent Variable)
FP = Fraud Prevention (Dependent Variable)
BCI = Blockchain Integration (Independent Variable)
β_0 = Intercept or constant term
β_1 = Coefficient measuring the effect of blockchain integration
ε = Error term capturing other factors not included in the model

A Priori Expectation

The a priori expectation shows the expected direction of the relationship between the variables.

$\beta_1 > 0$

This implies that blockchain integration is expected to have a **positive effect** on accounting accuracy and fraud prevention in SMEs.

Variable Measurement Table

Variable	Type	Measurement	Expected Sign
Blockchain Integration (BCI)	Independent	Degree of adoption of blockchain in accounting systems	+
Accounting Accuracy (AA)	Dependent	Reliability and correctness of financial records	+
Fraud Prevention (FP)	Dependent	Reduction in fraudulent financial activities	+

Analytical Techniques

Mean, standard deviation, minimum and maximum values and frequency and percentage are employed to analyze the data and test the study hypotheses. The study adopts the Pearson Product Moment Correlation Coefficient to measure the degree of association between the variables. The correlation coefficient ranges from:

- **-1 to +1**

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Where:

+1 indicates a strong positive relationship
-1 indicates a strong negative relationship
0 indicates no relationship between variables.

The study uses Ordinary Least Squares (OLS) regression technique to estimate the relationship between the variables in the model.

Regression analysis helps to:

(a) Determine the magnitude of the relationship between variables
(b) Test the study hypotheses
(c) Identify the statistical significance of blockchain integration on accounting accuracy and fraud prevention.

Hypothesis testing (t-test)

The t-test is used to determine the statistical significance of the regression coefficients. It helps to determine whether blockchain integration has a significant effect on accounting accuracy and fraud prevention.

Decision rule:

(a) If p-value < 0.05, reject the null hypothesis.
(b) If p-value > 0.05, accept the null hypothesis.

Coefficient of Determination (R^2)

The coefficient of determination explains the proportion of variation in the dependent variable that is explained by the independent variable in the regression model.

R^2 values range from 0 to 1.

(a) A higher R^2 value indicates a stronger explanatory power of the model.
(b) A lower R^2 value indicates weaker explanatory power.

Table 1: Descriptive Statistics

Variable	Mean	Std. Dev	Minimum	Maximum
Blockchain Integration (BCI)	3.86	0.72	1.00	5.00
Accounting Accuracy (AA)	4.14	0.63	2.00	5.00
Fraud Prevention (FP)	3.95	0.69	2.00	5.00

Interpretation of Descriptive Statistics

The descriptive statistics show that Blockchain Integration (BCI) has a mean value of 3.86, indicating that most SMEs moderately adopt blockchain technology in their accounting systems. The standard deviation of 0.72 suggests moderate variation in the level of blockchain adoption among SMEs.

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For Accounting Accuracy (AA), the mean value of 4.14 indicates that SMEs generally perceive their accounting systems as accurate and reliable. The relatively low standard deviation (0.63) suggests consistency in respondents' views regarding accounting accuracy. Similarly, Fraud Prevention (FP) has a mean value of 3.95, which implies that SMEs believe blockchain technology helps reduce fraudulent activities. The standard deviation of 0.69 indicates moderate variability in responses across the sampled SMEs.

The descriptive results suggest that blockchain technology plays an important role in improving accounting systems and reducing fraud in SMEs.

Table 2: Correlation Matrix

Variables	**BCI**	**AA**	**FP**
Blockchain Integration (BCI)	1.00		
Accounting Accuracy (AA)	0.64	1.00	
Fraud Prevention (FP)	0.59	0.67	1.00

Interpretation of Correlation Matrix

The correlation matrix shows the degree of association among the variables.

The result indicates that blockchain integration and accounting accuracy have a strong positive correlation of 0.64. This implies that increased adoption of blockchain technology is associated with improved accuracy in accounting records among SMEs. The correlation coefficient between blockchain integration and fraud prevention is 0.59, which indicates a positive relationship. This suggests that the adoption of blockchain technology contributes to reducing fraudulent activities within SMEs. Furthermore, the relationship between accounting accuracy and fraud prevention is 0.67, indicating that improvements in accounting accuracy are associated with better fraud control mechanisms. The correlation results confirm that blockchain integration is positively related to both accounting accuracy and fraud prevention.

Table 3: Regression Results

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Probability**
Constant	1.20	0.28	4.29	0.000
Blockchain Integration (BCI)	0.56	0.08	7.00	0.000

Model Summary

Statistic	**Value**
R	0.64
R^2	0.41

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Statistic	Value
Adjusted R^2	0.39
F-Statistic	49.00
Prob (F-Statistic)	0.000

Interpretation of Regression Results

The regression results indicate that blockchain integration has a significant positive effect on SMEs' accounting accuracy and fraud prevention. The coefficient of blockchain integration (0.56) indicates that a one-unit increase in blockchain adoption leads to a 0.56 increase in accounting accuracy and fraud prevention performance in SMEs. The t-statistic of 7.00 and p-value of 0.000 show that blockchain integration is statistically significant at the 5% level. This means that blockchain adoption significantly improves accounting accuracy and fraud prevention. The R^2 value of 0.41 indicates that approximately 41% of the variation in accounting accuracy and fraud prevention is explained by blockchain integration, while the remaining 59% may be influenced by other factors not included in the model. The F-statistic value of 49.00 with a probability value of 0.000 indicates that the overall regression model is statistically significant.

The results of the regression analysis revealed that blockchain integration has a positive and statistically significant effect on accounting accuracy among SMEs. This finding suggests that the adoption of blockchain technology improves the reliability, correctness, and transparency of financial records. Blockchain systems maintain a decentralized and immutable ledger in which transactions are recorded permanently and cannot be altered without consensus among network participants. This reduces errors associated with manual accounting systems and ensures that financial information remains accurate and reliable. The finding is consistent with the study of Mirza (2024), who reported that blockchain technology significantly improves financial reporting accuracy in SMEs by ensuring secure and tamper-proof transaction recording. Mirza emphasized that blockchain-based accounting systems reduce discrepancies in financial statements and enhance the reliability of financial information used for decision-making. The findings support the work of Georgiou, Sapuric, Lois and Thrassou (2024), who found that blockchain technology improves accounting processes by ensuring data integrity, enhancing transaction verification, and reducing reconciliation errors. Their study concluded that blockchain-based accounting systems provide more accurate financial information compared to traditional accounting methods. The results are also consistent with the findings of Sidabutar**,** Kesuma, Nasution, and Erwin (2025), who conducted a systematic literature review and concluded that blockchain technology improves transparency, accountability, and accuracy in financial reporting and auditing systems. According to the authors, blockchain ensures that financial data cannot be manipulated after recording, which

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significantly enhances accounting accuracy. These findings also align with the theoretical propositions of the Innovation Diffusion Theory, which explains how new technologies such as blockchain are adopted to improve organizational efficiency and operational performance. SMEs adopt blockchain systems because of their ability to enhance accounting accuracy and financial transparency. The results of the regression analysis further showed that blockchain integration has a significant positive effect on fraud prevention in SMEs. This implies that blockchain technology helps organizations reduce fraudulent financial practices by improving transparency, strengthening internal controls, and providing traceable financial transaction records.

Blockchain technology prevents fraud by creating a permanent and transparent record of transactions that can be easily verified by authorized users. Since financial records stored on blockchain networks cannot be altered without network consensus, opportunities for financial manipulation are greatly reduced. This finding is consistent with the study of Idehen and Mayor (2021), who found that blockchain technology significantly reduces financial fraud by improving transparency and traceability in financial transactions. The authors argued that blockchain-based accounting systems enable organizations to track financial transactions effectively, thereby minimizing opportunities for fraud. The findings also support the results of Ekokotu and Ofor (2025), who examined blockchain technology and fraud mitigation in Nigerian organizations. Their study revealed that blockchain adoption significantly reduces fraudulent activities by strengthening transaction security and improving financial monitoring systems.

In addition, Adejumo and Ogburie (2024) found that blockchain technology enhances fraud detection and prevention in accounting systems by providing an immutable record of financial transactions. According to their study, blockchain-based accounting platforms enable real-time monitoring of financial activities, making it easier to detect suspicious transactions. These findings are also consistent with the Fraud Triangle Theory developed by Donald Cressey (1953). The theory states that fraud occurs when individuals have pressure, opportunity, and rationalization to commit fraudulent acts. Blockchain technology reduces the opportunity for fraud by strengthening internal control systems and ensuring transparency in financial records.

The correlation analysis revealed a strong positive relationship between accounting accuracy and fraud prevention. This suggests that accurate financial records contribute significantly to reducing fraudulent activities within SMEs. When financial transactions are recorded accurately and transparently, organizations are better able to detect irregularities and prevent financial manipulation. Accurate accounting systems also improve auditing processes and strengthen financial accountability within organizations. This finding aligns with the results of Sidabutar et al. (2025), who found that blockchain technology enhances financial monitoring and fraud detection through improved data accuracy and transparent

transaction records. Their study emphasized that accurate financial data is essential for identifying fraudulent activities in organizations. Blockchain integration plays a crucial role in improving accounting systems among SMEs. The technology enhances financial record accuracy, strengthens transparency, and significantly reduces fraudulent activities in business operations.

These findings confirm that blockchain technology can transform traditional accounting practices by introducing more secure, transparent, and efficient financial management systems. For SMEs, the adoption of blockchain-based accounting systems can improve financial reporting quality, enhance internal control mechanisms, and increase stakeholder confidence in financial information.

CONCLUSION AND RECOMMENDATIONS

This study examined the effects of blockchain integration on SMEs' accounting accuracy and fraud prevention**.** The study also found that blockchain integration significantly improves fraud prevention mechanisms in SMEs**.** The transparency, traceability, and security features of blockchain technology make it difficult to manipulate financial transactions, thereby reducing opportunities for fraudulent activities. The availability of permanent transaction records and real-time verification also improves auditing processes and strengthens internal control systems within organizations.

These findings support previous studies which indicate that blockchain technology enhances financial transparency, improves accounting data accuracy, and strengthens fraud detection and prevention systems in organizations. For example, studies have shown that the decentralized ledger structure of blockchain improves the reliability of financial reporting and reduces the risk of manipulation in financial transactions. The study concludes that blockchain technology has significant potential to transform accounting systems in SMEs by improving financial record accuracy, strengthening transparency, and minimizing fraud risks**.** The adoption of blockchain-based accounting systems can therefore enhance financial accountability, improve organizational efficiency, and increase stakeholder confidence in the financial information produced by SMEs.

Based on the findings of the study on the effects of blockchain integration on SMEs' accounting accuracy and fraud prevention, the following recommendations are proposed:

i. SMEs should adopt blockchain-based accounting systems in order to improve the accuracy, transparency, and reliability of their financial records. Blockchain technology provides a decentralized and immutable ledger that minimizes accounting errors and enhances financial data integrity.
ii. SME owners, accountants, and financial managers should be provided with adequate training on the use of blockchain technology in accounting and financial

management. Capacity-building programs will help improve their technical knowledge and enable them to effectively implement blockchain-based accounting systems.

iii. Government agencies responsible for SME development should create supportive policies and regulatory frameworks that encourage the adoption of blockchain technology in business operations. Government support in the form of digital infrastructure, innovation grants, and technology development programs will facilitate blockchain integration among SMEs.

iv. Technology firms and financial institutions should collaborate to develop affordable blockchain platforms specifically designed for SMEs. Such platforms should be user-friendly, cost-effective, and adaptable to the financial reporting needs of small and medium enterprises.

v. SMEs should integrate blockchain technology with existing internal control systems in order to strengthen financial monitoring and fraud detection. The transparency and traceability provided by blockchain technology can significantly reduce opportunities for financial manipulation and fraudulent activities.

v. SMEs should partner with financial technology (FinTech) companies to facilitate the integration of blockchain technology into their accounting systems. Collaboration with fintech firms will help SMEs access technical expertise and advanced financial technologies that enhance financial reporting efficiency.

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