JOURNAL OF CULTURAL ANALYSIS AND SOCIAL CHANGE

Journal of Cultural Analysis and Social Change,
2025, 10(4), 372-382
ISSN: 2589-1316

Management Accounting System as Mediating the Relationship of Blockchain Technology and Strategic Management Accounting on Sustainability Performance

Imam Abu Hanifah[1*], Tubagus Ismail[2], Vierina Clyde[3]

[1] *Faculty of Economics and Business, Accounting Department, Sultan Ageng Tirtayasa University, Indonesia; Email: imamabuhanifah@untirta.ac.id*
[2] *Faculty of Economics and Business, Accounting Department, Sultan Ageng Tirtayasa University, Indonesia*
[3] *Faculty of Economics and Business, Accounting Department, Sultan Ageng Tirtayasa University, Indonesia*

*Corresponding Author: imamabuhanifah@untirta.ac.id

Citation: Hanifah, I. A., Ismail, T., & Clyde, V. (2025). Management Accounting System as Mediating the Relationship of Blockchain Technology and Strategic Management Accounting on Sustainability Performance. *Journal of Cultural Analysis and Social Change*, *10*(4), 372–382. https://doi.org/10.64753/jcasc.v10i4.2841

Published: December 4, 2025

ABSTRACT

This paper analyzes the dimensions of management accounting system as mediating the relationship of blockchain technology and strategic management accounting on sustainability performance in the manufactured company in JABODETABEK region, Indonesia. This research adopts quantitative method and survey method. This study relied on self reported primary data from an administered survey by spreading questionnaires to 259 Manager in Manufacture Company, Indonesia that have participated in PROPER. Data were analyzed using structural equation modeling with the assistance of SmartPLS 3.3 software. This study proposed nine hypotheses to evaluate the relationships among the variables, where five hypotheses showed positive associations and four revealed negative result. The results contribute to a better understanding of how management accounting systems influence sustainability outcomes in the context of emerging digital technologies and strategic practices.

Keywords: Management Accounting System, Blockchain Technology, Strategic Management Accounting, Sustainability Performance

INTRODUCTION

In recent years, the dual forces of market globalization and digital transformation have accelerated innovation across industries, prompting a fundamental shift in management accountants' roles from traditional stewardship to strategic partners equipped with predictive and analytical skills [1]. This shift is particularly evident as emerging technologies like blockchain offer enhanced data transparency, security, and real-time processing, enabling management accounting systems to function more dynamically and responsively. Furthermore, systematic literature reviews confirm that blockchain technology supports the transformational evolution of management accounting systems by facilitating immutable transaction records, reducing errors, and improving decision inputs [2], [3].

The world's most valuable corporations are predominantly those operating through digital and internet-driven platforms [4]. Various groups, ranging from academics and media professionals to business executives and government officials, are showing heightened interest in the growth and practical use of advanced digital innovations, including blockchain, artificial intelligence (AI), big data analytics, the Internet of Things (IoT), and cloud-based solutions. Of these technologies, blockchain has emerged as a key player, often referred to as the fifth core pillar of the information technology revolution [5], and is projected to serve as a foundation for building the next generation of internet infrastructure [4], [6].

Since introduction by Satoshi Nakamoto in 2008, blockchain has rapidly evolved beyond its initial use as a transactional system for Bitcoin. Currently, blockchain technology has been adopted in numerous sectors, one of which is accounting. A core feature of this innovation is its use of Distributed Ledger Technology (DLT), which facilitates the decentralized recording of transactions across several interconnected systems [7]. This distributed approach helps reduce the risk of errors in financial disclosures, thereby enhancing the precision and dependability of accounting data [8].

Recognized as a transformative and disruptive advancement, blockchain offers solutions to various shortcomings found in conventional centralized transaction frameworks. Blockchain represents a form of distributed ledger that enables participants with authorized access to exchange and validate transaction records [9]. Within such a framework, the ledger is continuously updated and verified collectively by all permitted members of the network [10]. When contrasted with centralized systems, blockchain delivers greater transparency and strengthens data security management.

The transformative potential of blockchain extends beyond internet use and is expected to revolutionize operational practices across diverse sectors, including finance, accounting, and auditing. Blockchain supports automated data governance and strengthens data credibility, offering benefits such as long-term cost efficiency, reduced manual errors, and lower risks of manipulation and fraud through secure and direct control over data [11]. Furthermore, evolving technology could redefine how management accountants perform their roles [12]. The integration of such innovations fundamentally alters the scope of responsibilities for accounting professionals [13].

In recent years, blockchain technology has become increasingly influential, particularly in areas such as sustainability initiatives and supply chain management. The technology's ability to enhance transparency and streamline operations is closely aligned with the objectives of sustainable management accounting systems [14]. By integrating blockchain, organizations can strengthen both environmental and social performance, aligning strategic accounting methods with ethical principles and stakeholder expectations, thereby developing stronger frameworks to support sustainable business operations [14].

The integration of blockchain with strategic management accounting has the potential to reshape accounting practices, ultimately improving sustainability outcomes through greater compliance, increased stakeholder engagement, and data-informed decision-making in response to heightened environmental and social pressures [15]–[18]. This synergy not only helps businesses address challenges in blockchain adoption but also opens pathways for cost efficiencies, creating strong incentives to adopt systems that balance profitability with sustainability objectives [15]–[18].

Despite its promise, embedding blockchain into management accounting is not without obstacles. Organizations face a range of technical, organizational, and environmental barriers that must be managed to fully leverage blockchain's benefits in accounting contexts [15]–[18]. Frameworks such as the Technology Organization Environment (TOE) model can be instrumental in pinpointing these challenges and offering strategic guidance for effective, sustainability-oriented blockchain implementation that also strengthens financial outcomes [15].

Currently, there is a lack of comprehensive understanding of blockchain among many finance professionals, highlighting the growing need for specialized positions to manage its impact on accounting and finance [12]. This skill gap compels both academia and industry to prioritize training and capacity development. Successful integration requires identifying barriers early and fostering robust organizational change initiatives [15]. In addition, advancing the Sustainable Development Goals (SDGs) and building collaborative networks among stakeholders are essential for cultivating trust and encouraging participation both critical to blockchain's success in accounting systems. Strengthening such networks supports the wider achievement of sustainability goals across supply chains [15], [19]. Ultimately, the effective application of blockchain in accounting depends on a company's willingness to innovate, its readiness to confront implementation hurdles, and a cultural mindset committed to sustainability.

Blockchain technology demonstrates considerable promise for enhancing the way information is exchanged and administered within accounting frameworks [7], [20], particularly in the context of management accounting applications [21]. Its incorporation increases the value and relevance of insights generated by management accounting processes [22] and also facilitates environmentally responsible accounting methods [23]. A growing body of literature has explored blockchain's influence on improving organizational efficiency and operational effectiveness.

Management accounting systems play a pivotal role in disseminating and applying sustainability-related knowledge across different organizational levels [24]. More than just data delivery tools, these systems function as adaptive communication channels, offering precise, timely, and easily accessible inputs to decision-makers, thereby supporting more informed and strategic choices [25]. Understanding how such systems contribute to sustainability goals is therefore crucial in an increasingly digital environment. Luthra and Mangla [26] note that firms in developing nations often face systemic limitations, including insufficient technology infrastructure and a lack of cultural readiness for innovation.

Evidence also suggests that higher levels of digital transformation improve an organization's ability to support contemporary accounting systems, particularly those oriented toward sustainability. Research reports a positive link

between the degree of digital adoption and the integration of blockchain for strengthening management accounting systems [27].

The present study aims to fill an existing gap by evaluating the combined effect of blockchain and strategic management accounting on both management accounting systems and sustainability performance. While most prior research examined these components in isolation, this work proposes a comprehensive framework incorporating both elements, with digital transformation as a moderating variable. This acknowledges the pivotal role technological advancement plays in connecting innovation, accounting operations, and sustainable outcomes. The ultimate objective is to introduce a new model for merging technology and strategic accounting practices to reinforce organizational sustainability.

Legitimacy Theory, an extension of social contract theory argues that organizations must align their activities with the prevailing values of the society in which they operate to maintain public approval and credibility [28]. This framework describes the mutual relationship between businesses as internal actors and society as external stakeholders [29]. To sustain legitimacy, organizations are expected to conform to societal norms and expectations, which, although not always codified, serve as implicit standards shaping public perception and corporate conduct.

RESEARCH HYPOTHESIS

Blockchain Technology and Management Accounting Systems

Incorporating blockchain into management accounting systems allows firms to track transactions and expenses in real time. This technology enhances visibility and accountability, enabling more accurate tracking of financial operations and minimizing risks related to fraud or misstatements in reports [15]. The unalterable nature of blockchain records boosts stakeholder confidence in the integrity of financial governance [30]. As a result, traditional audit functions may require reevaluation, given that blockchain's automation and real-time features demand accountants to possess advanced tech skills for interpreting and handling such systems [30], [31].

Beyond financial operations, blockchain also influences cost and inventory accounting by offering a secure and distributed system to record and verify supply chain data. Its application may promote innovative business models within management accounting and support alignment with sustainability objectives, key priorities for modern stakeholders. These transformations alter the roles of auditors and accountants, who must adapt by developing expertise in digital systems and data interpretation.

H_1: Blockchain Technology positively influences Management Accounting Systems.

Strategic Management Accounting and Management Accounting Systems

Strategic Management Accounting (SMA) reshapes Management Accounting Systems (MAS) by embedding strategic priorities into accounting activities. This evolution responds to the demand for accounting practices that not only meet financial reporting requirements but also align with organizational strategies, enhance decision-making, and strengthen performance amid market volatility and competition. Accountants now need to play a more dynamic role, leveraging IT tools to integrate strategy with operations and foster a responsive, improvement-focused business culture [32].

With this shift, management accountants are better positioned to utilize technological advancements and analytics to support strategic evaluations and planning. This contributes to more effective decision-making and boosts the organization's competitiveness [33], [34]. SMA also enables continuous performance monitoring and adaptation to market dynamics, ensuring that MAS contributes meaningfully to sustaining competitive advantage in the digital age [35]–[37].

H_2: Strategic Management Accounting positively impacts Management Accounting Systems.

Management Accounting Systems and Sustainability Performance

In the digital era, predictive and preventative functionalities embedded in MAS can be expanded through technologies like blockchain within broader Industrial IoT systems [38]. MAS, especially when integrated with blockchain, facilitates digitization and real-time monitoring, enhancing efficiency, problem-solving capabilities, and resource management.

This effectiveness stems from the recognition that robust management control frameworks direct decision-making and resource distribution toward key sustainability indicators ultimately improving both environmental and financial outcomes [39]. Integrating accounting systems with sustainability evaluation and reporting processes promotes more precise tracking of sustainability efforts, guiding strategic investments and reinforcing accountability.

H_3: Management Accounting Systems have a positive influence on Sustainability Performance.

Digital Transformation as a Moderator between Blockchain Technology and MAS

The rapid pace of digital innovation is reshaping business functions, including accounting. Blockchain, as a key component, brings about improvements in transparency, data integrity, and operational efficiency, prompting businesses to rethink conventional accounting methods [40]. As more firms deploy digital technologies such as cloud computing and advanced analytics, their accounting systems evolve to better align with strategic and operational goals [40].

Digital transformation supports automation and improves managerial decision-making by delivering accurate and timely financial insights, enhancing competitiveness [41]. Moreover, the fluidity of digital transformation encourages organizations to revise risk management practices, fostering innovative accounting approaches and reinforcing resilience in a digitized economy.

H_4: Digital Transformation moderates the relationship between Blockchain Technology and the Management Accounting System.

Digital Transformation as a Moderator between MAS and Sustainability Performance

Digital transformation plays a central role in supporting sustainable business practices, helping firms enhance their environmental, economic, and social outcomes [42]. It facilitates strategy implementation and enables the use of digital tools to reduce emissions and generate value sustainably. This highlights the importance of having clear digital strategies to meet sustainability targets [42].

However, while these technologies offer sustainability benefits, they must be integrated thoughtfully to avoid unintended environmental impacts, making it essential to align digital initiatives with sustainable objectives [43]. Strategic management accounting is instrumental in this context as it offers a comprehensive perspective in assessing and managing environmental, financial, and social metrics, leading to more responsible decisions [44]. Additionally, it enhances learning and growth processes beneficial to organizational development [45], [46].

H_5: Digital Transformation moderates the relationship between MAS and Sustainability Performance.

Strategic Management Accounting and Its Impact on Sustainability Outcomes

The relevance of sustainability in corporate activities has gained considerable momentum in recent times. This shift stems from the necessity for firms to harmonize their long-term strategies with sustainable initiatives, which can enhance both ecological and financial results [47]. Strategic management accounting plays a pivotal role in this alignment, particularly through the use of performance assessments and incentive structures. These evaluations facilitate insights into employee behavior, whether interpreted through qualitative or quantitative lenses. They form a foundational part of organizational systems that shape managerial effectiveness and contribute significantly to sustainability performance [48].

Effective implementation of strategic management accounting fosters improved sustainability outcomes. Inadequate environmental and social performance often originates from poor workplace conditions, potentially undermining both employee confidence and customer satisfaction. Adopting robust strategic management practices allows companies to address these issues proactively during evaluations, leading to enhanced trust among employees. This trust translates into improved service delivery and bolsters the organization's social and environmental reputation [49].

Incorporating sustainability indicators within conventional performance evaluations allows firms to monitor ecological and social impacts while simultaneously strengthening financial returns. This approach supports the creation and execution of sustainability-focused strategies by delivering crucial data for budget planning and resource allocation. Ultimately, such integration paves the way for organizations to evolve toward more sustainable operations [44], [50].

H_6: Strategic Management Accounting has a positive influence on Sustainability Performance.

Blockchain Technology on Sustainability Performance

Blockchain has become a groundbreaking technological development capable of reshaping numerous sectors, including sustainability. Its primary advantages transparency and traceability are especially beneficial in supply chain operations, where they strengthen stakeholder accountability and contribute to reducing environmental harm [15]. Since 2017, the integration of blockchain into supply chain management has drawn significant scholarly and industry interest, highlighting its rising importance in promoting sustainable practices across industries [15].

Insights from systematic literature reviews demonstrate that blockchain-based platforms can support substantial improvements in environmental stewardship, social justice, and governance processes, indicating the potential for widespread sustainability advancements throughout global supply chains [14]. The disruptive nature of blockchain lies in its ability to enable more agile and robust networks, which not only make better use of resources but also encourage active participation from stakeholders. This, in turn, supports a meaningful shift toward operational sustainability [14].

H_7: Blockchain Technology positively influences Sustainability Performance.

MAS as a Mediator in the Relationship between Blockchain Technology and Sustainability Performance

The growing integration of blockchain into supply chain systems has captured broad interest, driven by its potential to elevate sustainability performance [15], [14]. This attention stems from blockchain's capacity to deliver real-time visibility, enhance operational transparency, and ensure accountability, all of which directly support critical sustainability metrics such as environmental protection and social responsibility [17]. Furthermore, blockchain-based information systems have prompted a shift in managerial thinking, positioning these systems as essential to the pursuit of long-term sustainability within modern organizations [15].

At the same time, management accounting systems serve as a vital bridge between blockchain technology and sustainability outcomes. These systems help transform blockchain data into strategic insights that support planning, evaluation, and reporting of sustainability performance [15]. By interpreting blockchain-generated information, management accounting facilitates decision-making that aligns with environmental regulations and sustainability benchmarks, thereby reinforcing the strategic role of blockchain within broader sustainability frameworks [14], [15].

H_8: Management Accounting System mediates the Relationship between Blockchain Technology and Sustainability Performance.

MAS as a Mediator in the Relationship between SMA and Sustainability Performance

Accounting infrastructures are instrumental in linking strategic management accounting (SMA) practices to an organization's sustainability achievements [51]. These connections are realized through improved decision-making processes, where tools such as integrated reporting and environmental controls help align financial targets with broader sustainable development aims. As a result, organizations gain a deeper understanding of their social and ecological responsibilities [51].

Management accounting systems not only support sustainability assessments but also enhance competitiveness and ensure long-term resilience, as shown in recent studies stressing the need to embed sustainability into traditional accounting structures [52], [53]. Despite this, the accounting field has often been criticized for its limited role in advancing sustainable development. Critics argue that conventional accounting practices focus too narrowly on financial results, neglecting the broader social and ecological impacts of business operations [54].

Addressing these concerns requires accounting systems to take a pragmatic turn one that incorporates carbon accounting, sustainability indicators, and institutional support mechanisms for long-term sustainability strategies [54]. Additionally, as sustainability expectations evolve, ethical dimensions become increasingly central, prompting stakeholders to demand clarity regarding corporate environmental and social responsibilities. This necessitates that accounting professionals possess the expertise to integrate financial with non-financial performance effectively [52], [54].

H_9: Management Accounting System mediates the Relationship between Strategic Management Accounting and Sustainability Performance.

RESEARCH FRAMEWORK

This research framework is a continuation of studies conducted by Nguyen et al. [2], titled "Blockchain Technology and Sustainable Performance: Moderated Mediating Model with Management Accounting System and Digital Transformation", and the research made by Desak Nyoman Werastuti et al. [48], titled "Management Accounting System as Mediator on Sustainability Performance." This study aims to identify the gaps found in previous research. Most prior studies have focused on individual variables, either blockchain technology or strategic management accounting separately, with no integrated approach combining both.

Blockchain Technology and Strategic Management Accounting are positioned as independent variables in this study due to their significant contributions in improving the functionality of the management accounting system. Blockchain introduces enhanced transparency, robust security, and operational efficiency in financial data recording and reporting, thereby enabling real-time, data-informed decision-making. On the other hand, Strategic Management Accounting facilitates long-term value creation and provides analytical frameworks that enable organizations to optimize resource allocation strategically.

These two constructs serve complementary roles in addressing contemporary challenges such as digitalization and sustainability pressures. While Blockchain fortifies the reliability and efficiency of data and operational flows necessary for strategic accounting processes, Strategic Management Accounting ensures that the capabilities of blockchain are translated into actionable strategies and improved financial outcomes. Their integration in this research aims to offer a broader insight into the synergistic relationship between emerging technologies and strategic accounting practices, ultimately contributing to a more agile and responsive management accounting framework that aligns with dynamic organizational requirements.

In addition, the study incorporates Digital Transformation as a moderating variable, acknowledging its potential to strengthen the connection between technological advancements, accounting mechanisms, and sustainability outcomes.

This perspective offers an innovative approach to understanding how the convergence of digital technologies and strategic accounting can drive more impactful sustainability initiatives within organizations.

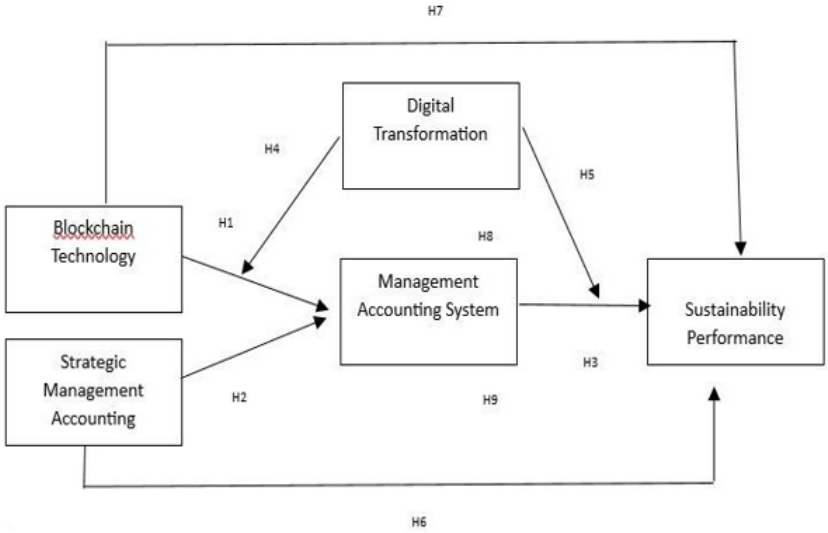

Figure 1. Theoritical Framework.

RESEARCH FRAMEWORK

The target population for this study consists of 259 managerial-level individuals working in manufacturing firms located in the Jabodetabek area, Indonesia, who have participated in the PROPER program. The sampling process applied the variance-based Partial Least Squares (PLS) method and utilized a combination of convenience sampling and non-probability purposive sampling, in line with the recommendations provided by Wong [55].

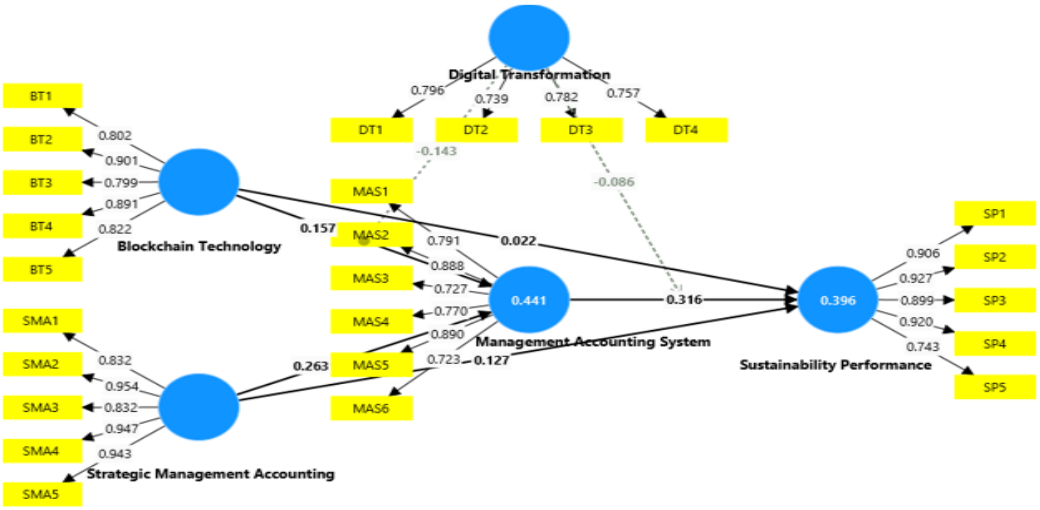

Figure 2. Result of testing.

Table 1. Validity and Reliability Testing.

Construct	Items	Loading	AVE	Composite Reliability	Cronbach's Alpha
Blockchain Technology	BT1	0,802	0,713	0,904	0,899
	BT2	0,901			
	BT3	0,799			
	BT4	0,891			
	BT5	0,822			
Digital Transformation	DT1	0,796	0,591	0,780	0,773
	DT2	0,739			
	DT3	0,782			

	DT4	0,757			
Management Accounting System	MAS1	0,791	0,642	0,890	0,887
	MAS2	0,888			
	MAS3	0,727			
	MAS4	0,770			
	MAS5	0,890			
	MAS6	0,723			
Strategic Management Accounting	SMA1	0,832	0,816	0,953	0,943
	SMA2	0,954			
	SMA3	0,832			
	SMA4	0,947			
	SMA5	0,943			
Sustainability Performance	SP1	0,906	0,777	0,926	0,926
	SP2	0,927			
	SP3	0,899			
	SP4	0,920			
	SP5	0,743			

Table 2. Hypothesis Testing.

No.	Description	Original sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T statistics (|O/STDEV|)	P values
1	BCT -> MAS	0,157	0,159	0,066	2,397	0,017
2	SMA -> MAS	0,263	0,265	0,073	3,601	0,000
3	MAS -> SP	0,316	0,315	0,069	4,596	0,000
4	DT -> BCT -> MAS	-0,143	-0,139	0,065	2,221	0,026
5	DT -> MAS -> SP	-0,086	-0,079	0,038	2,263	0,024
6	SMA -> SP	0,127	0,125	0,075	1,697	0,090
7	BCT -> SP	0,022	0,023	0,060	0,357	0,721
8	BT -> MAS -> SP	0,050	0,050	0,023	2,165	0,030
9	SMA -> MAS -> SP	0,083	0,083	0,030	2,810	0,005

RESULT

The Impact of Blockchain Technology on Management Accounting Systems

The findings indicate that BCT significantly influences the MAS, with a coefficient estimate of 0.157, a t-statistic of 2.397, and a p-value of 0.017. Given that the t-statistic exceeds the critical value of 1.96 and the p-value is below 0.05, the hypothesis is statistically supported. This suggests that the adoption of BCT positively contributes to the functioning of MAS.

The beneficial impact arises from blockchain's ability to improve transparency, data traceability, security, and the real-time exchange of information. These attributes play a vital role in enhancing the precision and promptness of both financial and non-financial information, key elements for efficient planning, monitoring, and decision-making processes in managerial accounting.

The Influence of Strategic Management Accounting on Management Accounting Systems

The results reveal that SMA significantly affects the MAS, with a coefficient of 0.263, a t-statistic of 3.601, and a p-value of 0.000. As the t-statistic surpasses the critical threshold and the p-value is under 0.05, this hypothesis is supported. This implies that SMA has a positive contribution to the MAS.

This influence is attributed to SMA expansion of focus beyond internal data, encompassing external, forward-looking, and qualitative information. It promotes a more strategic, anticipatory approach to management accounting, enabling the system to adapt more effectively to external pressures such as sustainability and competitive shifts in the business landscape.

The Effect of the Management Accounting System on Sustainability Performance

The analysis shows a coefficient of 0.316, with a t-statistic of 4.596 and a p-value of 0.000, indicating a statistically significant relationship between the MAS and Sustainability Performance. These results demonstrate that a well-developed MAS has a notably positive impact on sustainability outcomes.

This relationship is supported by the system's role in delivering timely and pertinent data, essential for making strategic decisions that incorporate social and environmental considerations. By advancing planning, performance evaluation, and control mechanisms, management accounting enables organizations to embed sustainability into their operational strategies and align their financial targets with broader sustainability goals.

The Moderating Role of Digital Transformation in the Relationship Between Blockchain Technology and the Management Accounting System

The interaction effect is quantified by a coefficient of -0.143, a t-statistic of 2.221, and a p-value of 0.026. As the t-statistic exceeds the reference value and the p-value is below the 0.05 significance level, this hypothesis is accepted. It suggests that DGT moderates the relationship between BCT and the MAS in a negative direction.

Although both blockchain and DGT are influential in reshaping business processes, their combined application within MAS may produce counterproductive effects. This could stem from the increased complexity introduced by integrating these advanced technologies. Blockchain's decentralized infrastructure and intensive computing requirements may impose major changes that existing systems are not adequately equipped to manage. Furthermore, rapid implementation of blockchain alongside digital tools, such as cloud platforms and advanced analytics, could create integration bottlenecks, potentially disrupting the smooth operation of accounting systems.

Digital Transformation as a Moderator between Management Accounting System and Sustainability Performance

The findings reveal a coefficient estimate of -0.086, a t-statistic of 2.263, and a p-value of 0.024. Given that the t-statistic surpasses the critical value and the p-value is below 0.05, the hypothesis is statistically supported. This suggests that the interaction between digital transformation and the management accounting system exerts a negative influence on sustainability performance.

In certain instances, the implementation of digital tools within accounting processes may increase complexity, particularly when organizations lack adequate preparation to manage the transition. This can create operational confusion or even employee resistance. Additionally, if the primary objective of digitalization is to enhance efficiency or financial gains without a parallel commitment to sustainability, it may not contribute significantly to sustainability targets. Moreover, the digitalization process itself can have environmental drawbacks, such as higher energy consumption or waste from outdated equipment, which may counteract the sustainability benefits it aims to produce.

The Influence of Strategic Management Accounting on Sustainability Performance

The analysis yields a coefficient of 0.127, a t-statistic of 1.697, and a p-value of 0.090. Because the t-statistic falls below the threshold and the p-value exceeds 0.05, this relationship is not statistically significant. Hence, Strategic Management Accounting (SMA) does not appear to significantly affect sustainability performance.

Although SMA is designed to facilitate long-term planning by incorporating both financial and non-financial metrics, its limited impact on sustainability outcomes could stem from its focus on profitability and market positioning, often at the expense of environmental or social performance metrics. If sustainability dimensions are not formally integrated into strategy formulation and measurement systems, SMA may lack the influence needed to drive sustainability improvements. Furthermore, the successful application of SMA in promoting sustainability relies heavily on the leadership's awareness and commitment to sustainable practices.

The Impact of Blockchain Technology on Sustainability Performance

The estimated coefficient for blockchain's influence on sustainability performance is 0.022, with a t-statistic of 0.357 and a p-value of 0.721. As the t-statistic does not exceed the critical value and the p-value is well above 0.05, the result is statistically insignificant. Thus, blockchain technology is not shown to significantly impact sustainability performance.

This lack of impact may be attributed to the relatively early stage of blockchain adoption and the fact that its application in sustainability-related initiatives has not yet matured. Many organizations are utilizing blockchain mainly to enhance operational functions rather than explicitly aiming to improve sustainability metrics, thereby reducing its direct effect on sustainability performance.

Management Accounting System as a Mediator between Blockchain Technology and Sustainability Performance

The analysis shows that blockchain indirectly influences sustainability performance through the management accounting system, with a path coefficient of 0.050, a t-statistic of 2.165 (greater than 1.96), and a p-value of 0.030 (less than 0.05), indicating a significant indirect relationship.

The management accounting system functions as a bridge by converting the key benefits of blockchain, such as data transparency, traceability, and real-time access, into actionable information for sustainability management. While blockchain enhances data quality across supply networks, the management accounting system ensures this information is integrated into performance assessments and decision-making processes. This synergy enables firms to better evaluate and report sustainability outcomes, thereby illustrating that blockchain's influence on sustainability is contingent upon its alignment with robust accounting infrastructures focused on sustainability.

Management Accounting System as a Mediator between Strategic Management Accounting and Sustainability Performance

A statistically significant indirect effect was observed between Strategic Management Accounting and sustainability performance via the management accounting system. The model reports a path coefficient of 0.083, a t-statistic of 2.810, and a p-value of 0.005, confirming the relationship's significance.

Strategic Management Accounting helps set long-term priorities, including sustainability, but its impact is realized only when these strategies are implemented through effective operational systems. The management accounting system facilitates this implementation by providing timely data, control mechanisms, and performance monitoring tools aligned with sustainability goals. Therefore, an efficient management accounting system enables strategic objectives from SMA to be translated into tangible, measurable outcomes, supporting the organization's sustainability initiatives

CONCLUSION

This research explores how the MAS functions as a mediating factor in the relationships between BCT, SMA, and DGT on the Sustainability Performance of manufacturing firms located in Indonesia's Jabodetabek area. The findings reveal that both BCT and SMA positively and significantly influence MAS, which in turn plays a substantial role in improving Sustainability Performance. Moreover, the study confirms that MAS effectively mediates the impact of BCT and SMA on Sustainability Performance. This suggests that the contributions of BCT and SMA to sustainability are not direct but occur through their integration within the accounting system. This highlights the essential role of MAS as a mechanism that converts strategic and technological inputs into sustainable outcomes.

Conversely, DGT was shown to negatively moderate the relationship between BCT and MAS, as well as the link between MAS and Sustainability Performance. These findings imply that DGT may not always enhance the utility of MAS in promoting sustainability. In fact, without proper alignment to organizational strategies and system structures, it could introduce complexities that weaken its effectiveness.

Additionally, the direct effects of BCT and SMA on Sustainability Performance were found to be statistically insignificant. This may suggest a requirement for more comprehensive integration, stronger alignment with strategic objectives, or a more advanced implementation approach to fully capitalize on their sustainability potential.

In essence, the research underscores the pivotal function of MAS in connecting strategic and digital innovations to sustainability objectives. It also highlights the necessity for wellconsidered, context-sensitive applications of digital and accounting tools. Future investigations may benefit from examining other relevant factors, such as leadership dynamics, organizational capacity, or environmental strategic alignment, to further enhance the relationship between accounting systems and sustainable business performance within Indonesia's manufacturing sector.

Ultimately, these results emphasize that the successful application of technology and strategic management practices depends on their alignment with contextual factors to drive sustainable value. This study also encourages further inquiry into additional variables that could enhance the link between technological advancement, accounting systems, and sustainability performance in the manufacturing context of Indonesia.

REFERENCES

[1] Appelbaum, D., Kogan, A., Vasarhelyi, M., & Yan, Z. (2017). Impact of business analytics and enterprise systems on managerial accounting. *International Journal of Accounting Information Systems, 25*, 29–44.

[2] Nguyen, T. T., Nguyen, H. M., Nguyen, N. T., & Le, H. T. T. (2023). Blockchain applications in accounting: A systematic literature review. *Journal of Accounting and Organizational Change, 19*(2), 295–315.

[3] Kostić, S., & Sedej, T. (2022). The role of blockchain technology in management accounting transformation. *Sustainability, 14*(19), 12578.

[4] Iansiti, M., & Lakhani, K. R. (2017). The truth about blockchain. *Harvard Business Review, 95*(1), 118–127.

[5] Thakkar, J. (2019). Blockchain: The fifth pillar of IT revolution. *International Journal of Computer Applications, 182*(47), 1–5.

[6] Shermin, V. (2017). Disrupting governance with blockchains and smart contracts. *Strategic Change, 26*(5), 499–509.
[7] Afifa, M., Elbahnasawy, N., & Nassar, H. (2023). Blockchain technology in accounting: Opportunities and challenges. *Accounting Research Journal, 36*(2), 217–234.
[8] Najafi, S., Khodadadi, A., & Ahmadi, M. (2022). Blockchain-based accounting systems: Potentials and challenges. *Journal of Emerging Technologies in Accounting, 19*(1), 85–104.
[9] Yoo, S. (2017). Blockchain based financial case analysis and its implications. *Asia Pacific Journal of Innovation and Entrepreneurship, 11*(3), 312–321.
[10] Yli-Huumo, J., Ko, D., Choi, S., Park, S., & Smolander, K. (2016). Where is current research on blockchain technology?A systematic review. *PLoS ONE, 11*(10), e0163477.
[11] Bonson, E., & Bednarova, M. (2019). Blockchain and its implications for accounting and auditing. *Meditari Accountancy Research, 27*(5), 725–740.
[12] Moll, J., & Yigitbasioglu, O. (2019). The role of internet-related technologies in shaping the work of accountants: New directions for accounting research. *The British Accounting Review, 51*(6), 100833.
[13] Pietrzak, Z., & Wnuk-Pel, T. (2015). Management accounting innovations: The case of Poland. *Journal of Accounting and Management Information Systems, 14*(3), 581–604.
[14] Park, K., & Li, H. (2021). Blockchain's impact on sustainable supply chain and accounting systems. *Journal of Cleaner Production, 310*, 127–285.
[15] Paliwal, S., Chandra, A., & Sharma, S. (2020). Blockchain technology for sustainable accounting and finance. *Sustainability, 12*(23), 9999.
[16] Bakarich, K. M., Hossain, M., & Weintrop, J. (2020). Blockchain and its impact on financial reporting and auditing. *Journal of Emerging Technologies in Accounting, 17*(2), 91–108.
[17] Kouhizadeh, M., Saberi, S., & Sarkis, J. (2021). Blockchain technology and the sustainable supply chain: Theoretically exploring adoption barriers. *International Journal of Production Economics, 231*, 107831.
[18] Sulkowski, A. J. (2018). Blockchain, law, and business supply chains. *Delaware Journal of Corporate Law, 43*(2), 303–336.
[19] Dutta, S., & Lawson, R. (2009). Business education and emerging technologies: Preparing students for the digital age. *Journal of Education for Business, 84*(6), 326–332.
[20] Jiang, Y., Liu, M., & Xu, X. (2021). Blockchain in supply chain management: A review and bibliometric analysis. *International Journal of Production Research, 59*(7), 2168–2199.
[21] Saberi, S., Kouhizadeh, M., Sarkis, J., & Shen, L. (2018). Blockchain technology and its relationships to sustainable supply chain management. *International Journal of Production Research, 57*(7), 2117–2135.
[22] Han, J., Wang, X., & Yu, J. (2023). Blockchain and management accounting: A new paradigm. *Accounting Horizons, 37*(2), 101–119.
[23] Wu, J., & Wang, C. (2020). Blockchain in management accounting: Potentials and challenges. *Asian Review of Accounting, 28*(3), 435–450.
[24] Rehman Khan, S. A., Yu, Z., & Golpîra, H. (2022). Sustainability integration with blockchain: A management accounting perspective. *Journal of Enterprise Information Management, 35*(5), 1201–1222.
[25] Maiti, S., Awasthi, A., & Tiwari, M. K. (2021). Blockchain for sustainable and green supply chain management. *Resources, Conservation and Recycling, 164*, 105–139.
[26] Ditillo, A. (2012). Designing management accounting systems to foster knowledge transfer in R&D organizations. *Accounting, Organizations and Society, 37*(1), 30–47.
[27] Azevedo, G., Rodrigues, L. L., & Craig, R. (2014). Disclosure of sustainability practices: The role of management accounting systems. *Social Responsibility Journal, 10*(1), 148–166.
[28] Luthra, S., & Mangla, S. K. (2018). Evaluating challenges to industry 4.0 initiatives for sustainable operations in developing economies. *Journal of Cleaner Production, 198*, 168–182.
[29] Massaro, M. (2021). Digital transformation and accounting: An exploratory study. *Journal of Accounting & Organizational Change, 17*(2), 230–250.
[30] Xu, M. (2020). Blockchain and financial governance: Opportunities and challenges. *Accounting Perspectives, 19*(3), 325–342.
[31] Mwange, A., & Chansa, C. (2022). Blockchain and auditing: Opportunities for Africa. *African Journal of Accounting, Auditing and Finance, 11*(1), 22–40.
[32] Wahyuni, S., Wicaksono, R., & Anwar, M. (2021). Strategic management accounting in digital transformation era. *Jurnal Akuntansi Multiparadigma, 12*(3), 567–584.
[33] Khalif, A., Idris, K., & Kassim, N. (2018). Strategic management accounting practices in Malaysian SMEs. *International Journal of Academic Research in Business and Social Sciences, 8*(4), 132–148.
[34] Kaye, G. R. (1988). Strategic management accounting: An appraisal. *Management Accounting, 66*(1), 34–39.

[35] Xiaowen, L. (2021). Strategic management accounting and enterprise competitiveness. *Modern Economy, 12*(3), 789–797.
[36] Tijani, I., & Mohammed, S. (2013). The role of strategic management accounting in corporate performance. *International Journal of Business and Social Science, 4*(12), 220–227.
[37] Wahyuni, S., & Prabowo, H. (2021). Strategic management accounting in emerging markets: Evidence from Indonesia. *Journal of Accounting and Investment, 22*(1), 45–59.
[38] Samadhiya, N., Gupta, R., & Patel, R. (2023). Blockchain-enabled industrial IoT for sustainable manufacturing. *Journal of Industrial Information Integration, 30*, 100391.
[39] Grewal, J., & Serafeim, G. (2020). Corporate sustainability and management accounting systems. *The Accounting Review, 95*(6), 1–33.
[40] Rehm, S. V. (2017). Digital transformation in accounting: Disruption or evolution? *Journal of Accounting and Management, 27*(2), 45–60.
[41] Meraghni, Z., Benhabib, A., & Boudiaf, A. (2021). Digital transformation and financial performance: Evidence from emerging markets. *Journal of Business Economics and Management, 22*(5), 1247–1263.
[42] Feroz, A. K., Zo, H., & Chiravuri, A. (2021). Digital transformation and environmental sustainability: A review and research agenda. *Sustainability, 13*(3), 1530.
[43] Lichtenthaler, U. (2021). Digitainability: The combined effects of digitalization and sustainability. *Journal of Cleaner Production, 280*, 124–187.
[44] Epstein, M. J., Buhovac, A. R., & Yuthas, K. (2015). *Managing sustainability performance measurement and reporting*. Springer.
[45] Petera, P., Wagner, J., & Buus, T. (2020). Strategic management accounting techniques in the context of sustainability. *Journal of Competitiveness, 12*(4), 123–139.
[46] Sitawati, N., Wahyudi, R., & Pratiwi, D. (2017). Strategic management accounting and sustainability performance. *Jurnal Akuntansi dan Auditing Indonesia, 21*(1), 65–78.
[47] Coville, R. (2023). Strategic management accounting and sustainable business: A conceptual framework. *Journal of Sustainable Business, 8*(1), 45–60.
[48] Desak Nyoman Werastuti, D. N., et al. (2024). Strategic management accounting and sustainability performance. *International Journal of Economics and Business Research, 27*(2), 210–225.
[49] Miles, M. P., & Covin, J. G. (2000). Environmental marketing: A source of reputational, competitive, and financial advantage. *Journal of Business Ethics, 23*(3), 299–311.
[50] Sroufe, R., & Jernegan, L. (2020). Integrating sustainability into performance measurement systems. *Journal of Cleaner Production, 252*, 119–758.
[51] Laughlin, R. (1991). Environmental disturbances and organizational transitions and transformations: Some alternative models. *Organization Studies, 12*(2), 209–232.
[52] Maas, K., Schaltegger, S., & Crutzen, N. (2016). Integrating corporate sustainability assessment, management accounting, control, and reporting. *Journal of Cleaner Production, 136*, 237–248.
[53] Uyar, A. (2019). Sustainability reporting and management accounting. *Meditari Accountancy Research, 27*(4), 497–520.
[54] Ngwakwe, C. C. (2012). Rethinking management accounting for sustainability. *Meditari Accountancy Research, 20*(2), 176–193.
[55] K. K. Wong, "Partial Least Squares Structural Equation Modeling (PLS-SEM) Techniques Using SmartPLS," *Marketing Bulletin*, vol. 24, no. 1, pp. 1–32, 2013.

