Management Accounting Information System with Green Cybersecurity for Sustainable Green Practices: Insight into the Moderating Role of Government Regulation

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ABSTRACT

Recent research has emphasized the importance of SMEs in sustainable development and their active participation in the sustainability transition. Since the financial and non-financial information provided by the accounting department is of utmost vital to all stakeholders, information security management is considered essential. This study examined how green cybersecurity (GC) affected sustainable green practices (SGP) in SMEs. The paper examined how digitalized management accounting information systems (DMAIS) mediated GC-SGP. The study also examined how government regulation (GR) moderated GC, DMAIS, and SGP. This investigation implemented a quantitative methodology and adhered to a deductive approach. The data was collected from a sample of accountants in SMEs in Vietnam. Structural Equation Modeling was employed to analyze the data, with the support of SmartPLS 4.0. The results confirmed GC's strong correlation with SGP. Meanwhile, DMAIS partially mediated this relationship. The current study also found that GR significantly moderated GC, DMAIS, and SGP connections. These crucial findings could help build targeted DMAIS implementation strategies and GC adoption laws and regulations to promote SGP in SMEs.

Keywords: Cybersecurity, Green Practices, Government Regulation, Management Accounting, Sustainable Development

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INTRODUCTION

Over the past two decades, environmental challenges have grown, forcing organizations to prioritize sustainability. Sustainability drives transformation, innovation, and competitiveness in modern business. Larger corporations have traditionally spearheaded sustainability programmes, but small and medium enterprises (SMEs) are increasingly recognized as important and influential (Kato et al., 2024). SMEs drive regional economic growth and job creation (Kato et al., 2024). Recent findings have emphasized SMEs' crucial role in global sustainable development and their active participation in the sustainability transition (Gonçalves et al., 2022). SMEs should consider implementing sustainable green practices (SGP). SGP refers to enterprises' environmentally responsible and resource-efficient efforts to reduce fossil fuel use, carbon emissions, and promote renewable energy sources like solar panels and wind turbines. To genuinely achieve SGP, organizations must consider and apply all four dimensions: green human resource management, green innovation, green supply chain, and green marketing.

Management accounting uses sophisticated methods from accounting, finance, and management to improve business operations (CIMA, 2011). Thus, management accounting systems (MAS) are essential to modern business management (Dasanayaka et al., 2021). For changing environmental conditions, a firm's MAS may need reevaluation. Thus, traditional management accounting may not work in modern industry. Due to technological advances, the MAS changed significantly in the latter decade of the 20th century, forcing most organisations to innovate their accounting systems to collect high-quality and timely accounting information (Saleh & Al-Nimer, 2022). Thus, solutions that simplify accounting treatments for potential or present challenges and better strategic planning are needed, along with a suite of tools to support innovative strategy formulation (Jelonek et al., 2022). SMEs may implement digitalization in management accounting systems (DMAIS) to ensure business continuity and alleviate the negative effects of disruptions (Ratmono et al., 2023). DMAIS in this research referred to the integration of digital technologies into MAS to efficiently and effectively organize, process, analyze, and visualize information and make the right decisions to improve and enhance SGP.

Nonetheless, this extraordinary reliance on technology also presents new concerns, especially concerning security. The advancement of technology has introduced new issues, such as a surge in cybercrime, data breaches, targeted assaults, and nation-state cyberattacks (Saleem et al., 2024). No company can ensure the prevention of a cyber-attack; nevertheless, numerous cybersecurity best practices exist to mitigate the risk. Organizations must implement innovative ecologically sustainable technology for enduring processes and results. In this regard, the new era is characterized by the emergence of green cybersecurity (GC) technology, which reduces the adverse effects of information technology operations and establishes a sustainable, green environment (AL-Dosari et al., 2023). GC encompasses not only the processes associated with energy generation but also those associated with the manufacturing of products and services. AL-Dosari et al. (2023) defined GC as the techniques utilized to improve or optimize information technology. The notion entailed executing strategies that significantly reduced energy inefficiency and usage. This included tactics designed to conserve bandwidth and other techniques that sought to minimize energy consumption, ultimately leading to cost reduction (AL-Dosari et al., 2023).

Unfortunately, Khan et al. (2022) conducted a comprehensive examination of the significant cybersecurity concerns faced by enterprises. Identified key difficulties included insufficient cybersecurity knowledge, a scarcity of cybersecurity personnel, and inadequacies in cybersecurity policies and laws. The importance of cybersecurity regulation arose from its essential function in safeguarding information technology and computer systems (Srinivas et al., 2019). Such rules were essential for strengthening information technology and computer systems against emerging risks (Khaw et al., 2024). Cybersecurity regulations are statutes designed to safeguard the confidentiality, integrity, and availability of computer systems and their associated information (Seng, 2024). The prevalence, rigor, and enforcement of cybersecurity regulations are increasing (Seng, 2024). Compliance with cyber security legislation can provide an organization with legal and financial protection (Aboukadri et al., 2024). Research on the interplay between DMAIS, SGP, GC, and governmental regulation (GR) in SMEs within developing countries has been scarce until recently, primarily due to the novelty of these relationships. Antonini (2024) proposed paths to investigate the interaction of accounting, digital technology, information

systems, and environmental conservation. In this context, it is essential to formulate comprehensive management models and policies to advance and optimize the SGP of SMEs. This study aimed to investigate the possible influence of GC on the attainment of SGP in SMEs through DMAIS and GR. Research questions were methodically formulated based on the articulated rationale to fulfill the analysis of the research's primary objective.

1. RQ1: To what extent does GC impact SGP?

2. RQ2: Does DMAIS act as a mediator in interconnection between GC and SGP?

3. RQ3: Does GR moderate the interconnection between GC, DMAIS and SGP?

Firms must adopt green practices to address the increasing environmental concerns and sustainability issues, and they should not be concerned that this will have a negative impact on their financial performance (Aftab et al., 2024). Although SMEs are indispensable to all economies, they may induce substantial environmental harm (Bapat et al., 2023). There is a widespread agreement in the literature regarding the responsibility of SMEs for global pollution, resource consumption, and waste generation. Although sustainability initiatives have been traditionally led by larger corporations, there is a growing global recognition of the dynamic and impactful role that SMEs play in this domain (Kato et al., 2024). The current research contributes to the expanding corpus of literature on SGP in SMEs in developing countries. In doing so, the results of this study expanded the perspectives of academicians regarding the influence of GC on SGP. According to Sargsyan et al. (2024), by protecting green systems from disruptions and reducing waste, cybersecurity facilitates a more sustainable future. In cybersecurity, sustainability was not a matter of resource consumption; rather, it was a matter of future-proofing (Sargsyan et al., 2024). Based on the perspective of Al-Dosari et al. (2023), the new era was characterized by the emergence of GC technology, which was designed to reduce the adverse effects of information technology operations and establish a sustainable, green environment.

The current manuscript is a pioneer in the field of research on the mediating DMAIS in the relationship between GC and SGP. Accounting information systems research was significantly influenced by cybersecurity concerns (Cram et al., 2023). Saleem et al. (2024) also noted that this exceptional technological dependence presented new challenges, particularly in the area of security. New challenges have arisen as a result of the advancement of technology, such as an increase in cybercrime, data intrusions, targeted attacks, and even nation-state cyberattacks (Saleem et al., 2024). By doing so, the results of this study offered distinctive perspectives on the influence of GC on DMAIS. Additionally, the findings of the current study expanded the existing frontiers of comprehension regarding the influence of DMAIS on SGP. MAS is an organization's competitive advantage, as it is associated with management performance in order to enhance management quality. It was evident that MAS is the primary mediator in the long-term creation of ecological benefits under contemporary technological conditions (Islam et al., 2021).

The primary function of the MAS was to disseminate, locate, and implement sustainability knowledge within organizations. Specifically, MAS can be recognized as a network that provides senior managers with up-to-date, reliable, and accessible information to facilitate beneficial decision-making, in addition to serving as a data delivery instrument. It was therefore crucial to investigate the methods by which MASs were involved in the generation of sustainable performance in the current digital context (Matayong & Kamil Mahmood, 2013). The research's findings would serve as a rigid cornerstone, providing research pointers for future research on the moderating influence of GR on the relationships between GC, DMAIS, and SGP. Although the advancement of technology had facilitated the expansion of previously unimaginable areas, thereby significantly improving our overall quality of life, the rapid expansion of vulnerabilities and threats that were increasingly present with malicious intent had eclipsed these advantages, which simplified life (Rojas Ortiz, 2024). In recent years, governments, private industry, and policymakers have directed their attention to the emergence of cyber assailants and concerns regarding cyber espionage, cybercrime, and cyber warfare, resulting in a greater necessity for laws and regulation in the cyber domain (Greiman, 2022). Compliance with cyber security legislation can provide an organization with legal and financial protection (Aboukadri et al., 2024).

The development of SMEs has been significantly impeded by their incapacity to integrate sustainability into their organizations, and they were perpetually confronted with intense competition from both domestic and international markets (Lee et al., 2021). This manuscript is distinctive in its capacity to provide practitioners with valuable insights into the importance of SGP and the importance of prioritizing the adoption of GC. It achieves this by providing a framework that illustrates how cybersecurity can improve DMAIS, resulting in an increase in SGP. As a result, the research findings can assist senior managers of SMEs in enhancing their planning and promptly allocating resources to implement GC measures. In addition, the current manuscript's findings suggest that governmental influencers should implement modern methods and advocate for regulations regarding the implementation of GC.

The article is organized as follows. Section 2 gives a brief synopsis of the theoretical underpinnings and conceptual components. The third section focuses on building a research model and formulating research hypotheses. The study methodology is thoroughly covered in Section 4. Section 5 details the study's findings and discusses the consequences that came from them. The final section of the manuscript offers a thorough evaluation of the inherent constraints and helpful recommendations for further research.

LITERATURE REVIEW

Theoretical Underpinning

Institutional theory. The Institutional theory delineates the context of an institution's prospective structure and configuration (Alam & Miah, 2024). It pertains to the conceptions of how an organization sustains its status and legitimacy by adhering to legal and regulatory frameworks, statutes, judicial mandates, and various social and cultural norms that impose conformity pressures and standards inside the organizational context (Scott, 2014). The Institutional Theory delineates the anticipated context for the design and configuration of an institution, linked to concepts regarding how organizations and groups maintain their authority and status by conforming to legal and regulatory frameworks, statutes, judicial mandates, and other social and cultural norms that exert pressures for conformity and establish

standards within the organizational milieu (Scott, 2014). The Theory emphasizes the importance of regulations in the advancement of GC. These government regulations are mandatory mechanisms that are designed to facilitate the implementation of SMEs cybersecurity. Consequently, the context in which SMEs operate, and the implementation of new laws are the primary factors that influence the adaptation of businesses to legal requirements.

Stakeholder theory. The Stakeholder Theory has an impact on business ethics and organizational management (Mahajan et al., 2023), while the equilibrium between stakeholders is conducive to the development of value and ethics within an institute (De Gooyert et al., 2017). Additionally, stakeholders' interactions with the organization can enhance sustainable competitiveness and enhance the company's reputation. Previous research has classified drivers or pressures to implement sustainability into internal and external factors (Neri et al., 2021). Internal drivers are factors that are associated with the firm and its organization, while external drivers promote sustainability from agents outside the company. The manner in which SMEs confront decisions regarding SGP is influenced by both types of drivers. Consequently, the Stakeholder Theory can clarify the rationale behind the adoption of SGP. The emergence of digital technology has granted key stakeholders increased authority to advocate for digitalization and achieve sustainability transformation by exerting influence on organizations, either directly or indirectly (Jin et al., 2024). In this regard, the Stakeholder Theory can clarify the rationale behind the implementation of DMAIS.

Conceptual respects

Sustainable green practices. The original definition of sustainable development is ambiguous enough to include philosophical, theoretical, and constructive variants (Secchi et al., 2024). The Brundtland Report is the most cited original definition. The 1987 Brundtland Commission Report of the UN defined "sustainable development" as development that meets current requirements without compromising future needs. Social, cultural, environmental, and economic factors are interwoven in sustainable development. Sustainable development addresses current needs without compromising future needs in social, environmental, economic, and resource sustainability (Giddings et al., 2002). According to Ngo (2023), businesses use green techniques to reduce environmental effects. Green

practices are company efforts to protect the environment by reducing pollution, preserving resources, saving energy, recycling, and developing an ecologically conscious culture (Feng & Wang 2016). In line with the suggestion of Alraja et al. (2022), SGP in this research comprised of green supply chain management, green human resource management, green marketing, and green innovation. Global awareness of green practices, which are essential to competitive advantage, has grown exponentially (González-Viralta et al., 2023). Wang et al. (2023) examined what motivated SMEs, particularly food companies, to adopt green practices. Their research also sought to identify the main barriers to these methods' adoption. In SMEs, Alraja et al. (2022) link components with high correlations to create a comprehensive framework for sustainable performance. Pakistani SME owners used management accounting systems to ensure economic sustainability, according to Latif et al. (2023). Abdelhalim (2024) found that management accounting and big data analytics effectively integrated to improve business sustainability performance.

Digitalized management accounting information system. Management accounting helps businesses understand and improve their performance (Ylä-Kujala et al., 2023). Managers need financial and non-financial data from MASs for decision-making, control, and planning. These systems acquire, classify, summarize, and publish information for performance measurement, continuous improvement, and resource optimization (Drury, 2018). Digitalization is the adoption, use, and utilization of digital artefacts to change the socioeconomic environment, according to Gradillas and Thomas (2023). Digitalised MAS has changed data acquisition and action execution, transforming decision-making. In high-frequency trading, technologies and algorithms have replaced humans in the production and certification of knowledge and decision-making. Ratmono et al. (2023) examined how digitalization in management accounting systems improved management decision-making in urban SMEs in developing economies. Hassan and Maelah (2023) examined the relationship between management accounting information and performance, which was moderated by digital inclusion, among SMEs in Malaysia. Digitalized management accounting systems moderate the association between organizational mindfulness and resilience, according to Bui et al. (2024). Unfortunately, the fast growth of digital world due to technological improvement made cyber threat protection more difficult (Kamruzzaman et al., 2024).

Green cybersecurity. Cybersecurity, a complicated field of technology, procedures, and behaviours, that protects against interconnected networks, devices, and systems (Shahana et al., 2024). The digital age has made cybersecurity a growing concern as cyber threats become more sophisticated. Therefore, traditional security solutions often fail to stop dynamic and persistent threats (Malatji et al., 2022). AL-Dosari et al. (2023) emphasised the need of GC in Qatar to address urban transportation issues and achieve sustainable development. Brudni et al. (2024) created a "Green Security" taxonomy for cybersecurity solutions and energy. This study, building on the findings of AL-Dosari et al. (2023), defined GC as the techniques utilized to optimize information technology. Compliance ensures that companies follow rules, regulations, and best practices to protect their digital assets and sensitive data from cyberattacks. Enterprise cybersecurity compliance is governed by many laws, policies, and guidelines (Aboukadri et al., 2024).

Governmental regulation. According to Bag et al. (2021), GR includes government rules, policies, and regulations that force businesses to adopt new digital technology. Hou et al. (2018) found that government law drove technology adoption. Issakhankyzy et al. (2024) described Kazakhstan's information sector legal structure, operational trends, and legislative challenges. Akanfe et al. (2024) suggested that harmonizing blockchain technology with privacy regulation will maximize its potential, create a safe, privacy-focused technological framework and give policymakers with important insights. According to Abbas et al. (2023), Pakistani cyber and media laws protected customers from internet crimes and enable censorship (Abbas et al., 2023). In this research, GR referred to government legislation and regulations that strengthened business cybersecurity.

Hypothesis Development

Cybersecurity protects green systems and reduces waste, making the future more sustainable (Sargsyan, 2024). Building on the perspectives of Sargsyan (2024), cybersecurity fosters an environment that is conducive to the success of sustainable endeavors. It preserves the intricate network of interconnected systems that promote sustainability (Sargsyan, 2024). Cybersecurity is essential for circular economy in Industry 4.0 (Uriarte-Gallastegi et al., 2024). Most green internet technologies and cybersecurity systems are interrelated; thus, carbon footprints, algorithms, and

cybersecurity systems should be updated to reduce cyberattacks and security concerns (Vrchota et al., 2020). According to AL-Dosari et al. (2023), the green trend in cybersecurity may have a promising future in management and control of cyberattacks, which would facilitate sustainable development. Thus, the hypothesis proposed was as follows.

H1: GC is likely to significantly and positively impact SGP.

Advanced MAS tools for top management and operational business operations are being created as information technology advances. Management accounting benefits from digitalization in quality, efficiency, speed, decision-making, value-added opportunities, and new resources. Accounting information systems' quality and decision-making reliability affect a business's growth. Their efficiency depends on data input quality and data management techniques (Hamoud et al., 2020). Recent high-profile cybersecurity breaches and increased scrutiny from practitioners and regulators require organizations to assess the accounting implications of these incidents and take appropriate action (Janvrin & Wang, 2022). Real-time feedback allows GC systems to dynamically adjust inputs to increase accuracy and output. GC helps companies uncover data abnormalities in real time and take immediate action, improving operational decision-making. GC technology decreases the negative effects of information technology operations and creates a sustainable, green environment. Thus, the hypothesis proposed was as follows.

H2: GC is likely to significantly and positively impact DMAIS.

Digitalization may boost business performance by improving information quality and managerial decision-making (Ratmono et al., 2023). According to some scholars, MAS help managers achieve sustainability goals by providing vital information (Meiryani et al., 2023). MAS is an essential reporting system that provides stakeholders with high-quality accounting data for decision-making, including sustainable performance evaluation (Abu Affa & Saleh, 2022). MAS may create, acquire, and analyze accounting data for value creation with modern information technology (Ratmono et al., 2023). Digitalization may affect management accounting reporting, strategy execution and oversight, financial planning and analysis, competencies, duties, and organizational structure. Promoting sustainability

through DMAIS information integration helps coordinate options, reach consensus, and support specific activities. Thus, the hypothesis proposed was as follows.

H3: DMAIS is likely to significantly and positively impact SGP.

According to Rao et al. (2015), MAS application provides information for sustainable development by connecting people and promoting sustainable practices, and by storing and encoding sustainable practice information. Sustainability objectives require that customers and stakeholders are thoroughly informed and consistently updated via particular MAS (Asiri et al., 2020). Indeed, digital technology can automate oversight and business partner management accounting duties (van Slooten et al., 2024). Digitalization in accounting systems improves operational integration and internal control in a competitive environment, according to Ratmono et al. (2023). Computerized accounting systems help companies generate and store data for planning, evaluating, and investigating their operations and finances (Bshayreh & Hamour, 2020). An accurate digital budget computation and cost data system helps organizations budget, monitor, and assess performance more efficiently and affordably (Bataineh, 2018). Sargsyan (2024) strongly recommended building resilient digital and physical infrastructures that can endure cyberattacks and natural disasters. Sustainable initiatives can collapse without robust cyber defenses (Sargsyan, 2024). Process control and industrial decision-making uncertainty were greatly improved by cybersecurity (Uriarte-Gallastegi et al., 2024). To meet regulatory requirements and solve security concerns, green information technology advances must be planned and implemented (Rutkowska & Sulich, 2020). Thus, the hypothesis proposed was as follows.

H4: DMAIS is likely to mediate the relationship between GC and SGP.

SMEs can strategically and organizationally create cybersecurity management measures by appointing information security management teams, formulating policies, and developing cybersecurity risk assessment systems (Arroyabe et al., 2024). According to AL-Dosari et al. (2023), GC tackles social, economic, and environmental issues, encouraging sustainable development. In response, nations are diligently creating comprehensive cybersecurity plans, resilient regulations, and strong cyber laws. These efforts

reflect a nation's cyber capabilities and its desire for citizen cyber security (Saleem et al., 2024). Cyber law regulates digital activities, cybersecurity, and data privacy. Cyberlaw covers digital evidence, intellectual property, and criminal crimes relating to the internet and related technologies (Li & Liu, 2021). These policies may address internal or external concerns and be driven by an organization's security goals or regulations (Saleem et al., 2024). Cyber laws help organizations prevent fraud, privacy violations, identity theft, and data theft. Thus, the hypotheses proposed was as follows.

H5A: GR is likely to moderate the relationship between GC and DMAIS.
H5B: GR is likely to moderate the relationship between GC and SGP.
H5C: GR is likely to moderate the relationship between DMAIS and SGP.

The research model, based on the produced hypotheses and variables, is illustrated in Figure 1:

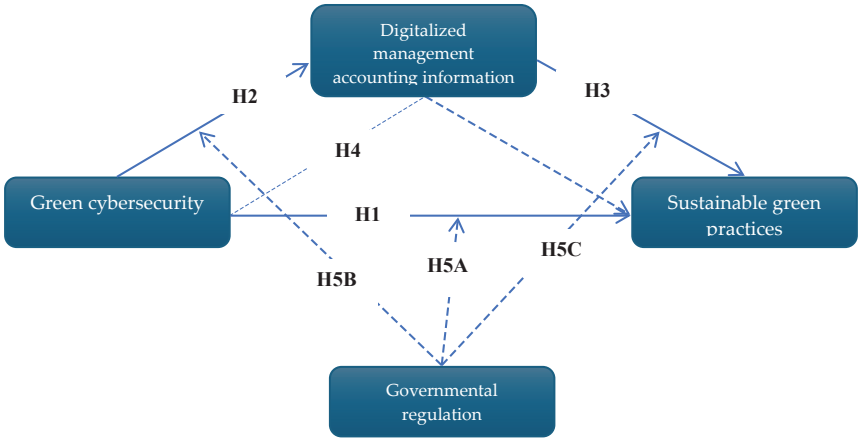

Figure 1: Research Model and Hypotheses

RESEARCH METHODOLOGY

Measurement Scale Development

Data was collected via questionnaire in this quantitative study. The initial English measurements were translated into Vietnamese, followed by a back-translation approach to ensure the absence of translation bias.

The results indicated that the back-translated data was very consistent with the original measurements. To evaluate the questionnaire's clarity, relevance, and comprehensiveness, 10 academic and industrial specialists were surveyed. Some minor changes were recommended. Additionally, a pilot test was done with 80 respondents before the main survey. According to previous study, Cronbach's alpha was used to measure data consistency at 0.7. Each construct had Cronbach's alpha values above the threshold, indicating data reliability for analysis. Table 1 shows all constructs and scale items in the proposed model.

Table 1: Summary of Constructs with Corresponding Indicators

Construct	Indicator	References
	Green cybersecurity	
Confidentiality		
	CO1: Green cyber security facilitates the secure exchange of corporate information in cyberspace	Arpaci and Sevinc (2021)
	CO2: Our firm guarantees that the data disseminated in cyberspace is accessible only to the appropriate individuals and organizations.	
	CO3: Our firm has no problem with anyone finding the information about our firm details in cyberspace.	
Control/Possession		
	CP1: Green cybersecurity approaches facilitate the secure exchange of corporate information pertaining to climate plans and strategies of our firm in cyberspace	Arpaci and Sevinc (2021)
	CP2: Our firm uses a verification service to enhance the security of our firm's email passwords.	
	CP3: Our firm prioritizes the security of passwords for our firm's accounts.	
Integrity		
	INT1: With the support of green cybersecurity, storing data in cyberspace is safe.	Arpaci and Sevinc (2021)
	INT2: Information and documents that our firm has stored in cyberspace will be stored and protected securely.	
	INT3: With the support of green cybersecurity, sharing data in cyberspace does not involve any risk.	
Authenticity		
	AU1: With the support of green cybersecurity, our firm opens links and attachments in e-mails from people our firm do not know.	Arpaci and Sevinc (2021)
	AU2: With the support of green cybersecurity, our firm has opened spam mail sent to our firm's e-mail address.	
	AU3: With the support of green cybersecurity, our firm has opened links and attachments from uncertain sources.	

Construct	Indicator	References
	Digitalized management accounting information system	
	DMAIS1: The digitalized management accounting system aids the organization in the rapid identification of financial operations' opportunities and challenges.	
	DMAIS2: The digitalized management accounting system aids the organization in the rapid identification of opportunities and challenges related to non-financial operations.	
	DMAIS3: The digitalized management accounting system aids the firm in improving its capacity to promptly identify opportunities and issues in the non-financial aspects of the market.	Patiar and Mia (2008); Ratmono et al. (2023)
	DMAIS4: The digitalized management accounting system aids the organization in improving its capacity to promptly detect changes in the external environment.	
	DMAIS5: The digitalized management accounting system aids the organization in improving its capacity to promptly identify the probability of future events occurring.	
	Sustainable green practices	
Green human resource management		
	GHRM1: Our firm is committed to providing environmental training to both employees and managers.	
	GHRM2: Our firm is dedicated to attracting people by demonstrating a strong commitment to the environment.	Guerci et al. (2016)
	GHRM3: Our firm is committed to engaging its employees and managers in environmental matters.	
Green innovation		
	GI1: Our firm evaluates suppliers based on environmental factors	Benzidia et al. (2021), Singh and El-Kassar (2019)
	GI2: Our firm provides guidance to vendors regarding environmental technical matters.	
	GI3: Our firm involves suppliers in the process of designing and developing environmentally-friendly products or services.	
Green supply chain		
	GSC1: Our firm promotes the utilization of e-commerce due to its superior environmental sustainability.	
	GSC2: Our firm assumes the additional expense associated with an environmentally-friendly product or service.	Chung (2020), Fatoki (2019)
	GSC3: Our firm prioritizes utilizing digital communication strategies to promote our products/services due to their superior environmental sustainability.	
Green marketing		
	GM1: Our firm employs greener and renewable technology to achieve cost savings in areas such as energy, water, and waste management.	Aboelmaged and Hashem (2019); Chen and Liu (2020)
	GM2: Our firm undertakes the task of redesigning and enhancing products or services in order to comply with new environmental criteria or directives.	
	GM3: Our firm uses materials that are highly recyclable, reusable, and biodegradable.	

Construct	Indicator	References
	Governmental regulation	
	GR1: The efficiency and effectiveness of critical processes can be enhanced through governmental regulation	
	GR2: The integration and interoperability of systems can be facilitated by governmental regulation	Srinivas et al. (2019)
	GR3: The method of deploying new technologies and business models can be structured by governmental regulation	

Sampling and Data Collection

The long-term economic growth of Vietnam has been strikingly comparable to that of Association of Southeast Asian Nations since the economic reforms of 1986 (Luc & Tu, 2024). Investment in digital infrastructure, policies, and initiatives to support enterprises and citizens have led to success in some places (Cuong & Le, 2024). Vietnam's technology community includes small startups and large development companies (Nguyen et al., 2024). Our target was Vietnamese SMEs. As a developing nation, Vietnam has launched many environmental sustainability and digitalization programs for SMEs. Respondents in the accounting departments comprised the target population. This employees' knowledge and assistance were crucial to company sustainability strategies. The study used convenience and snowball sampling. Convenience sampling was a non-probability sampling procedure in which units were chosen for inclusion in the sample based on their ease of access for the researcher. Meanwhile, snowball sampling was a recruitment method in which research participants are requested to help researchers identify additional potential subjects.

The researcher started convenience sampling by choosing the most available respondents. The initial pool of participants was used to find new study volunteers who met the requirements until the group size is reached. PLS-SEM's minimum sample size was usually determined by the "10 times rule". This strategy assumed that the sample size should be at least tenfold larger than the highest number of latent variable linkages in either the inner or outer model (Sarstedt et al., 2022). Participants were assured confidentiality and told their replies would be used only for academic study. They were also advised that their involvement was voluntary, allowing them to resign at any time without consequence. From December 2023 to June 2024, 800 survey questionnaires were distributed to accounting staff at Vietnamese SMEs. After eliminating surveys with significant

faults, anomalous, or conflicting responses, 654 valid questionnaires were collected, yielding a 81.75% response rate. This study analyzed statistical data with SPSS 29.0 and SmartPLS 4.1.0.3. Table 2 shows a thorough description of the demographic data collected from the survey.

Table 2: Demographic Information

Respondent's Demographic Profile	Variables	Usable Responses	Weight (%)
Gender of respondent			
	Male	261	39.91
	Female	393	60.09
Age of respondent			
	30 – under 40	87	13.30
	40 – under 50	438	66.97
	Over 50	129	19.72
Experience of respondent (years)			
	10 - under 20	92	14.07
	20 - under 30	491	75.08
	30 - under 40	71	10.86
Business type			
	Agriculture, forestry, fisheries	23	3.52
	Industry & construction	10	1.53
	Service	621	94.95

RESEARCH RESULTS ANALYSIS AND DISCUSSION

Common Method Bias

The Harman one-factor technique was employed and discovered that the initial factor explained around 15.898% of the variance, which was below the 50% criterion. Guidelines of Kock (2015) were also employed in research. The variance inflation factor scores, which ranged from 1.000 to 2.780, were lower than the recommended cutoff of 3.3. According to Kock (2015), these values highlighted that CMB did not pose any substantial problems in the sample. In the nutshell, there was no apparent presence of common technique bias in our study.

Measurement model assessment

The Cronbach's alpha value was determined to be between 0.760 and 0.870 (Table 3), which exceeded the accepted threshold of 0.7 (Hair et al., 2022). In the same vein, the composite reliability values (Table 3) were within the range of 0.842 to 0.915, which were deemed acceptable for the social sciences (Hair et al., 2022). The findings indicated that the framework's internal consistency was satisfactory, as evidenced by the fact that the Dijkstra-Hensele's rho values of all items which ranged from 0.762 and 0.873 exceeding 0.7 (Dijkstra & Henseler, 2015). Outer loading and average variance extracted (AVE) were employed to evaluate convergent validity (Hair et al., 2022). The threshold of 0.70 was exceeded by all outer loadings as reported in Table 3 (Hair et al. 2022). The absence of convergent validity issues was confirmed by the fact that all AVEs were between 0.644 and 0.782, which was greater than the criterion value of 0.50 (Hair et al., 2022).

Table 3: Results Summary of Measurement Model Assessment

Constructs and operationalization		Convergent validity		Construct reliability			Result
		Factor Loadings	AVE	Cronbach's Alpha	Composite Reliability	Dijkstra-Hensele's rho	
Green cybersecurity	**GC**						
Confidentiality	CO	0.792 - 0.868	0.692	0.778	0.871	0.784	Retained
Control/possession	CP	0.832 - 0.889	0.734	0.818	0.892	0.821	Retained
Integrity	INT	0.795 - 0.844	0.676	0.760	0.862	0.762	Retained
Authenticity	AU	0.867 - 0.883	0.762	0.844	0.906	0.844	Retained
Digitalized management accounting information system	DMAIS	0.787 - 0.858	0.659	0.870	0.906	0.873	Retained
Sustainable green practices	SGP						
Green human resource management	GHRM	0.846 - 0.914	0.782	0.860	0.915	0.865	Retained
Green supply chain	GI	0.803 - 0.848	0.693	0.778	0.871	0.780	Retained
Green marketing	GSC	0.796 - 0.861	0.695	0.781	0.872	0.786	Retained
Green innovation	GM	0.830 - 0.890	0.749	0.832	0.900	0.835	Retained
Governmental regulation	**GR**	0.709 - 0.934	0.644	0.765	0.842	0.770	Retained

The Heterotrait-Monotrait (HTMT) ratio was employed to evaluate discriminant validity (Table 4). The HTMT criterion of 0.85 was employed to assess discriminant validity, where coefficients below 0.85 signify sufficient discriminant validity (Henseler & Schuberth, 2020). In conclusion, we asserted that, in addition to demonstrating convergent validity, the measurement scales employed in our study model exhibited strong discriminant validity, indicating that each item effectively assessed its own variable.

Table 4: Results Summary of Discriminant Validity on Heterotrait–Monotrait Ratio

	AU	CO	CP	EDMAS	GHRM	GI	GM	GR	GSC	INT
AU										
CO	0.214									
CP	0.176	0.534								
EDMAS	0.155	0.514	0.203							
GHRM	0.258	0.328	0.122	0.359						
GI	0.369	0.306	0.129	0.432	0.398					
GM	0.138	0.153	0.045	0.200	0.328	0.372				
GR	0.030	0.070	0.138	0.096	0.064	0.046	0.028			
GSC	0.331	0.277	0.165	0.190	0.484	0.380	0.260	0.047		
INT	0.126	0.456	0.289	0.289	0.063	0.141	0.056	0.108	0.140	

Structural Model Assessment

The variance inflation factor values for all estimates in the current research were below the threshold of 3.3, showing that collinearity did not alter the estimations (Kock, 2015). Subsequently, the significance and relevance of the interconnections inside the structural model were evaluated. The significance was evaluated by employing a bootstrapping algorithm with 10,000 subsamples and utilizing the percentile bootstrapping technique as the mechanism for determining the confidence interval. Building on the bootstrap results in Table 5, SGP was verified to be impacted by GC (β = 0.195; t-value = 4.381; p-value = 0.000) and DMAIS (β = 0.381; t-value = 11.877; p-value = 0.000). In the same vein, DMAIS was corroborated to demonstrate a significant and positive effect on SGP (β = 0.276; t-value = 7.311; p-value = 0.000). In light of this, H1-H3 were empirically supported. Mediation analysis was performed to determine the indirect relationship

between GC and SGP. First, the significance of GC's indirect impact on SGP through DMAIS was evaluated. Given that the direct effect of GC on SGP was also supported (β = 0.195; t-value = 4.381; p-value = 0.000) and that the indirect effect was significant (β = 0.105; t-value = 5.950; p-value = 0.000), it was determined that DMAIS partially mediated the association between GR and SGP (Hair et al., 2022). As a result, the findings indicated partial mediation. To that end, H4 was empirically supported. The current research assessed the moderating role of GR in the interconnection between GC, DMAIS and SGP. Statistically, there was evidence of the moderating effect of GR in the interconnection between GC and DMAIS (β = 0.129; t-value = 3.194; p-value = 0.001) as well as DMAIS and SGP (β = 0.111; t-value = 2.317; p-value = 0.021). Nevertheless, the obtained findings highlighted that GR positively moderated the impact of GC on SGP (β = 0.127; t-value = 2.697; p-value = 0.007). Thus, H5A – H5C were empirically supported. The values of R2 were 0.214 for SGP and 0.177 for DMAIS. The score of f2 in Table 5 put an accent on the fact that GC and DMAIS demonstrated small impacts on SGP (0.039 and 0.077, respectively). Conversely, GC illustrated a medium impact on DMAIS (0.174). The values of Q2 were 0.072 for SGP and 0.115 for DMAIS.

Table 5: Results Summary of Hypotheses Acceptance

Relevant path	Path coefficient	SE	95% Confidence interval	VIF	t-value	p-value	Result
Direct effect							
GC è DMAIS	0.381	0.032	[0.314 - 0.441]	1.016	11.877	0.000	Supported
GC è SGP	0.195	0.044	[0.105 - 0.277]	1.262	4.381	0.000	Supported
DMAIS è SGP	0.276	0.038	[0.201 - 0.349]	1.241	7.311	0.000	Supported
Indirect effect							
GC è DMAIS è SGP	0.105	0.018	[0.073 - 0.142]	-	5.950	0.000	Supported
Moderating effect							
GR x GC è DMAIS	0.129	0.040	[0.052 - 0.203]	1.015	3.194	0.001	Supported
GR x GC è SGP	0.127	0.047	[0.041 - 0.219]	1.184	2.697	0.007	Supported
GR x DMAIS è SGP	0.111	0.048	[0.004 - 0.192]	1.205	2.317	0.021	Supported
R^2	R^2_{SGP} = 0.214; R^2_{DMAIS} = 0.177						
f^2	$f^2_{GC \Rightarrow SGP}$ = 0.039; $f^2_{GC \Rightarrow DMAIS}$ = 0.174; $f^2_{DMAIS \Rightarrow SGP}$ = 0.077						
Q^2	Q^2_{SGP} = 0.072; Q^2_{DMAIS} = 0.115						

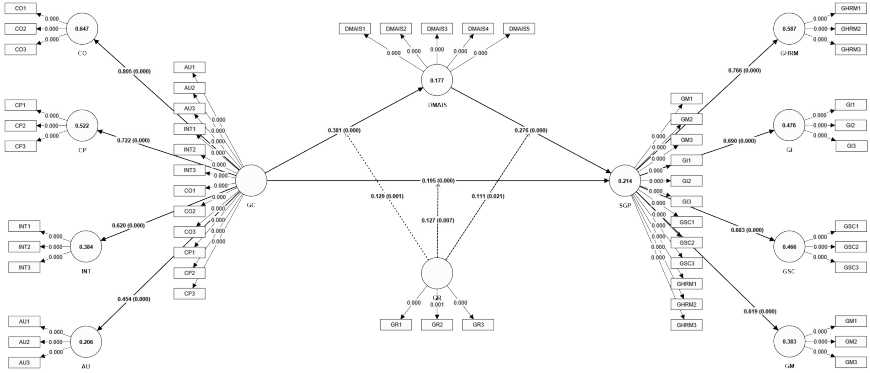

Figure 2: Structural Model

DISCUSSION AND IMPLICATION

Theoretical implication. The researchers' expectations were confirmed by the statistical evidence that GC significantly affected SGP. In particular, GC can help SMEs improve SGP. This discovery expanded upon the observations made in the study conducted by AL-Dosari et al. (2023), which examined the influence of GC on sustainable development, and the study of Sargsyan (2024) which deepened the potential of cybersecurity as a backbone for sustainability. Cybersecurity improves process control and reduces industrial decision-making uncertainty (Uriarte-Gallastegi et al., 2024). Sargsyan (2024) stressed cybersecurity for a sustainable future. Lack of cyber defences makes sustainability projects vulnerable (Sargsyan, 2024). Cybersecurity protects technology and supports sustainable projects (Sargsyan, 2024). Bai et al. (2020) and Rutkowska and Sulich (2020) found that green information communication technologies were necessary to address economic, social, and environmental issues and promote sustainable development. To comply with regulations and reduce security concerns, green information technology must be constantly developed and implemented (Rutkowska & Sulich, 2020).

This study showed that DMAIS partially mediated the GC-SGP connection. It was shown that DMAIS can help SMEs improve SGP. This research expanded the observations of the study conducted by Latif et al. (2023), which underlined the impact of management accounting systems on economic sustainability in SMEs, and the observations of the study

of Nguyen et al. (2023), which placed emphasis on the mediating role of management accounting systems in the relationship between blockchain and sustainable performance. Due to rapid external environmental change, developing country SMEs are more vulnerable to threats. These developments demand SMEs to adapt and evolve to sustainably address new issues (Al-Hattami et al., 2024). Thus, fast and accurate financial information transmission to assist SMEs' strategic decision-making has become more important. DMAIS can provide value by easing accounting data development, acquisition, and analysis using modern information-technology properties (Ratmono et al., 2023). DMAIS helps managers understand organizational and situational context, make decisions, and implement sustainable development strategies. This research revealed GC's ability to help DMAIS improve SGP in organizations. Accounting information systems research must address cybersecurity issues (Cram et al., 2023). Strong security mechanisms must safeguard DMAIS from hacking and other cybercrimes. CG implementations enable operational security, resource protection, incident response, attack prevention and mitigation, software vulnerability, change and configuration management, and system security resilience.

This study improves the literature by examining how GR moderates GC, DMAIS, and SGP interconnections. Increased cyber attackers and concerns about cyber espionage, cybercrime, and cyber warfare have drawn the attention of governments, businesses, and policymakers, increasing demand for cyber legislation and regulation (Greiman, 2022). Cyber law governs digital operations, cybersecurity, and data privacy. It covers fraud, copyright, data protection, and privacy laws. Cyberlaw covers digital evidence, intellectual property, and internet-related crimes (Li & Liu, 2021). Cybersecurity legislation protects human rights and privacy, economic interests, and national security by establishing proactive regulations and incentives to secure public and private information, systems, and networks (Kosseff, 2017). Businesses may avoid identity and data theft, privacy violations, and fraud with these cyber regulations.

Practical implication. This study has many practical implications. The current research is important for SMEs wanting to use multiple resources to improve their SGP in response to changing conditions. Our study showed that SME management may use DMAIS to get accurate and timely information

for decision-making, reducing business disruptions and enhancing SGP. The findings should encourage SMEs to adopt digital systems. Thus, SMEs must raise organizational knowledge of DMAIS adoption. Only financially stable SMEs had adopted DMAIS and benefited from digitalization. Thus, without external support, most SMEs in emerging economies would struggle to implement DMAIS and reap its benefits. Thus, governments may encourage DMAIS deployment, provide complimentary software, subsidies, lines of credit, low-interest loans, tax incentives, or training workshops for SMEs. Research has shown that CG was the main factor that improved DMAIS's SGP efficacy in SMEs. Mainly, the obtained findings of this study emphasize the importance of GC in increasing DMAIS data accuracy for informed decision-making. SMEs must ensure GC implementation. SME managers must educate employees about cyber dangers and prioritize continuing GC training to equip all staff with the necessary skills. GC project execution requires infrastructure, digital platforms, and other tangible resources, which SMEs should prioritize. The statistical findings of this study suggest that GR may affect GC, DMAIS, and SGP connections. To combat cybercrime, policymakers should promulgate strict cyber laws and comprehensive national cybersecurity plans. To combat new security risks, government officials must prioritize cybersecurity research and development. To promote policy agility and efficacy, policymakers must regularly evaluate and adjust cybersecurity policies through feedback systems and expert engagement. More crucially, information exchange, collaborative investigations, and public-private partnerships can build confidence and accountability among states, improving international cybersecurity cooperation.

LIMITATION AND AGENDA FOR FUTURE RESEARCH

In all scientific endeavors, limitations are inevitable, but they can shape the future. As this study was among the few research to examine the relationship between GC, DMAIS, SGP, and GR in Vietnamese SMEs, the findings may not apply to other nations. To compare results and improve understanding, future research may replicate this study across sectors, enterprises, and nations. The measuring scales, conceptual frameworks, and generalizability of findings can be verified by subsequent study. This study examined Vietnamese SME accounting staff. Other departments remain unchecked. Thirdly, like empirical research, this study collected

data using a questionnaire. More study should use qualitative methods. This study showed DMAIS effectiveness mediating functions. Thus, future research may uncover new mediating factors. This research showed GR's moderating effects. Therefore, future research may expand this moderating function and identify more moderating factors. Because cross-sectional data was collected at one time rather than over numerous periods, it cannot accurately detect component correlations. Thus, longitudinal data would overcome this.

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REFERENCES

Abbas, Z., Khan, R., Khan, M. Z., & Imran, M. (2023). Cyber Laws and Media Censorship in Pakistan: An Investigation of Governmental Tactics to Curtail Freedom of Expression and Right to Privacy. *Journal of Creative Communications*, 1–14. https://doi.org/10.1177/09732586231206913.

Abdelhalim, A.M. (2024). How management accounting practices integrate with big data analytics and its impact on corporate sustainability. *Journal of Financial Reporting and Accounting, 22*(2), 416-432. https://doi.org/10.1108/JFRA-01-2023-0053.

Aboelmaged, M., & Hashem, G. (2019). Absorptive capacity and green innovation adoption in SMEs: The mediating effects of sustainable organisational capabilities. *Journal of Cleaner Production, 220*, 853–863. https://doi.org/10.1016/j.jclepro.2019.02.150.

Aboukadri, S., Ouaddah, A., & Mezrioui, A. (2024). Machine Learning in Identity and Access Management Systems: Survey and Deep Dive. *Computers and Security, 139*, 1-28. https://doi.org/10.1016/j.cose.2024.103729.

Abu Affa, M. M., & Saleh, I. (2022). Management accounting systems effectiveness, perceived environmental uncertainty and companies' performance: The case of Jordanian companies. *International Journal of Organizational Analysis, 30*(2), 259–288. https://doi.org/10.1108/IJOA-07-2020-2288.

Akanfe, O., Lawong, D., & Rao, H. R. (2024). Blockchain technology and privacy regulation: Reviewing frictions and synthesizing opportunities. *International Journal of Information Management, 76*, 1-20. https://doi.org/10.1016/j.ijinfomgt.2024.102753.

Alam, M. K., & Miah, M. S. (2024). Do Islamic banks use institutional theory in the light of Shariah governance? Empirical evidence from a Muslim dominant country. *Heliyon, 10*, 1-13. https://doi.org/10.1016/j.heliyon.2024.e24252.

AL-Dosari, K., Fetais, N., & Kucukvar, M. (2023). A shift to green cybersecurity sustainability development: Using triple bottom-line sustainability assessment in Qatar transportation sector. *International Journal of Sustainable Transportation, 17*(12), 1287-1301. doi: 10.1080/15568318.2023.2171321.

Al-Hattami, H.M., Senan, N.A.M., Al-Hakimi, M.A., & Azharuddin, S. (2024). An empirical examination of AIS success at the organizational level in the era of COVID-19 pandemic. *Global Knowledge, Memory and Communication, 73*(3), 312-330. https://doi.org/10.1108/GKMC-04-2022-0094.

Alraja, M.N., Imran, R., Khashab, B.M., & Shah, M. (2022). Technological Innovation, Sustainable Green Practices and SMEs Sustainable Performance in Times of Crisis (COVID-19 pandemic). *Information Systems Frontiers, 24*, 1081–1105. https://doi.org/10.1007/s10796-022-10250-z.

Antonini, C. (2024). Accounting digitalization in the quest for environmental sustainability. *Current Opinion in Environmental Sustainability, 66*, 1-6. https://doi.org/10.1016/j.cosust.2023.101399.

Arpaci, I., & Sevinc, K. (2022). Development of the cybersecurity scale (CS-S): Evidence of validity and reliability. *Information Development, 38*(2), 218–226. https://doi.org/10.1177/0266666921997512.

Arroyabe, M. F., Arranz, C. F. A., De Arroyabe, I. F., & de Arroyabe, J. C. F. (2024). Exploring the economic role of cybersecurity in SMEs: A case study of the UK. *Technology in Society, 78*, 1-10. https://doi.org/10.1016/j.techsoc.2024.102670.

Asiri, N., Khan, T., & Kend, M. (2020). Environmental management accounting in the Middle East and North Africa region: Signifcance of resource slack and coercive isomorphism. *Journal of Cleaner Production, 267*, 1-15. https://doi.org/10.1016/j.jclepro.2020.121870.

Bag, S., Pretorius, J.H.C., Gupta, S., & Dwivedi, Y.K. (2021). Role of institutional pressures and resources in the adoption of big data analytics powered artificial intelligence, sustainable manufacturing practices and circular economy capabilities. *Technological Forecasting and Social Change, 163*, 1-14. https://doi.org/10.1016/j.techfore.2020.120420.

Bai, C., Dallasega, P., Orzes, G., & Sarkis, J. (2020). Industry 4.0 technologies assessment: a sustainability perspective. International Journal of Production Economics, 229, 1-15. https://doi.org/10.1016/j.ijpe.2020.107776.

Bataineh, A. (2018). The effect of using computerized accounting information systems on reducing production costs in Jordanian pharmaceutical companies. *International Journal of Business and Management Invention, 7*(7), 1–10.

Benzidia, S., Makaoui, N., & Bentahar, O. (2021). The impact of big data analytics and artificial intelligence on green supply chain process integration and hospital environmental performance. *Technological Forecasting and Social Change, 165*, 1-13. https://doi.org/10.1016/j.techfore.2020.120557.

Brudni, S., Anidgar, S., Brodt, O., Mimran, D., Shabtai, A., & Elovici, Y. (2024). Green Security: A Framework for Measurement and

Optimization of Energy Consumption of Cybersecurity Solutions. 2024 IEEE 9th European Symposium on Security and Privacy (EuroS&P), 08-12 July 2024, Vienna, Austria, pp. 676-696. https://doi.org/10.1109/EuroSP60621.2024.00043.

Brundtland, G. (1987). Report of the World Commission on environment and development: Our common future. United Nations General Assembly document A/42/427.

Bshayreh, M. M., & Hamour, A. M. A. (2020). The role of accounting information systems in reducing indirect industrial costs. *Academy of Accounting & Financial Studies Journal, 24*(5), 1–10.

Bui, Q. H., Tran, A. H., Tu, T. H., & Nguyen, P. N. (2024). Resilience and Performance Among Vietnamese Business Organizations in Turbulent Environments: How Do Digitalized Management Accounting Systems and Organizational Mindfulness Matter? *SAGE Open*, 1–19. https://doi.org/10.1177/21582440241271225.

Chen, J., & Liu, L. (2020). Customer participation, and green product innovation in SMEs: The mediating role of opportunity recognition and exploitation. *Journal of Business Research, 119*, 151–162. https://doi.org/10.1016/j.jbusres.2019.05.033.

Chung, K. C. (2020). Green marketing orientation: Achieving sustainable development in green hotel management. *Journal of Hospitality Marketing and Management, 29*(6), 722–738. https://doi.org/10.1080/19368623.2020.1693471.

CIMA. (2011). Sustainability and the role of the management accountant. *Research executive summary series, 7*(14) , 1-14.

Cram, W. A., Wang, T., & Yuan, J. (2023). Cybersecurity Research in Accounting Information Systems: A Review and Framework. *Journal of Emerging Technologies in Accounting, 20*(1), 15–38. https://doi.org/10.2308/JETA-2020-081.

Cuong, N.H., & Le, D.K. (2024). Vietnam Digital Transformation and the Way Forward. In: Tran, H.V.T., Shioji, H., Le, H.L.T., Hayashi, T. (eds) *Knowledge Transformation and Innovation in Global Society* (pp 141–164). Springer, Singapore. https://doi.org/10.1007/978-981-99-7301-9_7.

Dasanayaka, C. H., Murphy, D. F., Nagirikandalage, P., & Abeykoon, C. (2021). The application of management accounting practices towards the sustainable development of family businesses: A critical review. *Cleaner Environmental Systems, 3*, 1-14. https://doi.org/10.1016/j.cesys.2021.100064.

De Gooyert, V., Rouwette, E., van Kranenburg, H., & Freeman, E. (2017). Reviewing the role of stakeholders in Operational Research: A stakeholder theory perspective. *European Journal of Operational Research, 262*(2), 402–410. https://doi.org/10.1016/j.ejor.2017.03.079.

Dijkstra, T.K., & Henseler, J. (2015) Consistent partial least squares path modeling. *MIS Quarterly, 39*, 297-316. https://doi.org/10.25300/MISQ/2015/39.2.02

Drury, C. (2018). *Cost and Management Accounting*. Boston: Cengage Learning.

Fatoki, O. (2019). Green marketing orientation and environmental and social performance of hospitality firms in South Africa. *Foundations of Management, 11*(1), 277–290. https://doi.org/10.2478/fman-2019-0023.

Feng, T., & Wang, D. (2016). The influence of environmental management systems on financial performance: A moderated-mediation analysis. *Journal of Business Ethics, 135*(2), 265-278. https://doi.org/10.1007/s10551-014-2486-z.

Giddings, B., Hopwood, B., & O'Brien, G. (2002). Environment, economy and society: fitting them together into sustainable development. *Sustainable Development, 10*(4), 187–196. https://doi.org/10.1002/sd.199.

Gonçalves de Almeida, J. M., Gohr, C. F., & Santos, L. C. (2020). Assessing collaborative capabilities for sustainability in interorganizational networks. *Sustainability, 12*(22), 1-17. https://doi.org/10.3390/su12229763.

González-Viralta, D., Veas-González, I., Egaña-Bruna, F., Delgado-Bello, C. V.-S. C., Pezoa-Fuentes, C. (2023). Positive effects of green practices on the consumers' satisfaction, loyalty, word-of-mouth, and willingness to pay. *Heliyon, 9*(10), 1-12. https://doi.org/10.1016/j.heliyon.2023.e20353.

Gradillas, M., & Thomas, L. D. W. (2023). Distinguishing digitization and digitalization: A systematic review and conceptual framework. *Journal of Product Innovation Management*, 1-32. https://doi.org/10.1111/jpim.12690.

Greiman, V.A. (2022). Cyber Law and Regulation. In: Lehto, M., Neittaanmäki, P. (eds) *Cyber Security. Computational Methods in Applied Sciences*, vol 56 (pp 59–78). Springer, Cham. https://doi.org/10.1007/978-3-030-91293-2_3.

Guerci, M., Longoni, A., & Luzzini, D. (2016). Translating stakeholder pressures into environmental performance – the mediating role of green HRM practices. *International Journal of Human Resource Management, 27*(2), 262–289. https://doi.org/10.1080/09585192.2015.1065431.

Hair, J.F., Hult, G.T.M., Ringle, C.M., & Sarstedt, M. (2022). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (3rd ed.). Thousand Oaks, CA: Sage.

Hamoud, A.K., Abd Ulkareem, M., Hussain, H.N., Mohammed, Z.A., & Salih, G.M. (2020). Improve HR decision-making based on data mart and OLAP. *Journal of Physics: Conference Series, 1530*, 1-12. https://doi.org/10.1088/1742-6596/1530/1/012058.

Hassan, H., Maelah, R. (2023). Management Accounting Information Usefulness, Digital Inclusion and Performance of SMEs. In: Alareeni, B., Hamdan, A. (eds) *Sustainable Finance, Digitalization and the Role*

of Technology. ICBT 2021. Lecture Notes in Networks and Systems, vol 487. Springer, Cham. https://doi.org/10.1007/978-3-031-08084-5_11.

Henseler, J., & Schuberth, F. (2020). Using confirmatory composite analysis to assess emergent variables in business research. *Journal of Business Research, 120*, 147-156. https://doi.org/ 10.1016/j.jbusr._ es.2020.07.026.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A New Criterion for Assessing Discriminant Validity in Variance-Based Structural Equation Modeling. *Journal of the Academy of Marketing Science, 43*, 115-135. https://doi.org/10.1007/s11747-014-0403-8.

Hou, Y., Velthof, G. L., Case, S. D. C., Oelofse, M., Grignani, C., Balsari, P., … Oenema, O. (2018). Stakeholder perceptions of manure treatment technologies in Denmark, Italy, the Netherlands and Spain. *Journal of Cleaner Production, 172*, 1620–1630. https://doi.org/10.1016/j. jclepro.2016.10.162.

Islam, T., Khan, M. M., Ahmed, I., & Mahmood, K. (2021). Promoting in-role and extra-role green behavior through ethical leadership: Mediating role of green HRM and moderating role of individual green values. *International Journal of Manpower, 42*(6), 1102–1123. https://doi. org/10.1108/IJM-01-2020-0036.

Issakhankyzy, A., Alibayeva, G. A., Sabitova, A. A., Zhetpisov, S. K., & Shansharbayeva, B. S. (2024). Legal mechanism for regulating responsibilities in the information sphere. International *Journal of Electronic Security and Digital Forensics, 16*(1), 14-27. https://doi. org/10.1504/IJESDF.2024.136014.

Janvrin, D. J., & Wang, T. (2022). Linking Cybersecurity and Accounting: An Event, Impact, Response Framework. *Accounting Horizons, 36*(4), 67–112. https://doi.org/10.2308/HORIZONS-2020-101.

Jelonek, D., Tien, N. H., Dao, M. T. H., & Minh, D. T. (2022). Comparative analysis of business strategy of Vietnamese real estate developers: The use of Hoffer matrix. *International Journal of Multidisciplinary Research and Growth Evaluation, 3*(1), 197–204.

Jin, Y., Yao, X., & Huang, M. (2024) Impact of stakeholder pressure on digital process innovation: An empirical analysis. *PLoS ONE, 19*(7), 1-20. https://doi.org/10.1371/journal.pone.0307528.

Kamruzzaman, M., Bhuyan, M. K., Hasan, R., Farabi, S. F., Nilima, S. I., & Hossain, M. A. (2024). Exploring the Landscape: A Systematic Review of Artificial Intelligence Techniques in Cybersecurity. 2024 International Conference on Communications, Computing, Cybersecurity, and Informatics (CCCI), Beijing, China, 16-18 October 2024, pp. 1-6.

Kato, A. I., Chiloane-Tsoka, E. G., & Mugambe, P. (2024). Unlocking the potential: the influence of sustainable finance solutions on the long-term sustainability of small and medium-sized enterprises. *Cogent Business & Management, 11*(1), 1-20. https://doi.org/10.1080/23311975.2024.2391122.

Khan, A.W., Zaib, S., Khan, F., Tarimer, I., Seo, J.T., & Shin, J. (2022). Analyzing and evaluating critical cyber security challenges faced by vendor organizations in software development: SLR based approach. *IEEE Access, 10*, 65044-65054. https://doi.org/10.1109/ACCESS.2022.3179822.

Khaw, T.Y., Amran, A., & Teoh, A.P. (2024). Building a thematic framework of cybersecurity: a systematic literature review approach. *Journal of Systems and Information Technology, 26*(2), 234-256. https://doi.org/10.1108/JSIT-07-2023-0132.

Kock, N. (2015). Common Method Bias in PLS-SEM: A Full Collinearity Assessment Approach. *International Journal of e-Collaboration (IJeC), 11*, 1-10. https://doi.org/10.4018/ijec.2015100101.

Kosseff, J. (2017). Defining cybersecurity law. *Iowa law review, 103*, 985-1031.

Latif, S., Izani Mohd Salleh, S., Abd. Ghani, M., & Ahmad, B. (2023). Management accounting systems and economic sustainability: a qualitative inquiry of SMEs in Pakistan. *Asian Review of Accounting, 31*(3), 367-386. https://doi.org/10.1108/ARA-05-2022-0123.

Lee, C. M., Che-Ha, N., & Syed Alwi, S. F. (2021). Service Customer Orientation and Social Sustainability: The Case of Small Medium Enterprises. *Journal of Business Research, 122*, 751–760. https://doi.org/10.1016/j.jbusres.2019.12.048.

Li, Y., & Liu, Q. (2021). A comprehensive review study of cyber-attacks and cyber security; Emerging trends and recent developments. *Energy Reports, 7*, 8176-8186. https://doi.org/0.1016/j.egyr.2021.08.126.

Luc, V. C., & Tu, N. D. (2024). Challenges in Searching for Vietnam's Growth Drivers Through 2030. *Asian Economic Policy Review, 19*(2), 252-267. https://doi.org/10.1111/aepr.12458.

Mahajan, R., Lim, W. M., Sareen, M., Kumar, S., & Panwar, R. (2023). Stakeholder theory. *Journal of Business Research, 166*, 1-16. https://doi.org/10.1016/j.jbusres.2023.114104.

Malatji, M., Marnewick, A.L., & Von Solms, S. (2022). Cybersecurity capabilities for critical infrastructure resilience. *Information and Computer Security, 30*(2), 255-279. https://doi.org/10.1108/ICS-06-2021-0091.

Matayong, S., & Kamil Mahmood, A. (2013). The review of approaches to knowledge management system studies. *Journal of Knowledge Management, 17*(3), 472–490. https://doi.org/10.1108/JKM-10-2012-0316.

Meiryani, M., Soepriyanto, G., & Audrelia, J. (2023). Effectiveness of regulatory technology implementation in Indonesian banking sector to prevent money laundering and terrorist financing. *Journal of Money Laundering Control, 26*(4), 892–908. https://doi.org/10.1108/JMLC-04-2022-0059.

Neri, A., Cagno, E., & Trianni, A. (2021). Barriers and drivers for the adoption of industrial sustainability measures in European SMEs: Empirical evidence from chemical and metalworking sectors. *Sustainable Production and Consumption, 28*, 1433–1464. https://doi.org/10.1016/j.spc.2021.08.018.

Ngo, Q.-H. (2023). Do environmental management practices mediate institutional pressures-environmental performance relationship? Evidence from Vietnamese SMES. *Heliyon, 9*(7), 1-19. https://doi.org/10.1016/j.heliyon.2023.e17635.

Nguyen, D.N.A., Nguyen, V.P. & Bui, K.H. (2024). Vietnam's Regulation on Intellectual Property Rights Protection: The Context of Digital Transformation. *International Journal for the Semiotics of Law 37*, 259–278. https://doi.org/10.1007/s11196-023-10076-1.

Nguyen, N.M., Abu Afifa, M. & Van Bui, D. (2023). Blockchain technology and sustainable performance: moderated-mediating model with management accounting system and digital transformation. *Environment, Development and Sustainability*, 1-23. https://doi.org/10.1007/s10668-023-04189-7.

Patiar, A., & Mia, L. (2008). The interactive effect of market competition and use of MAS information on performance: Evidence from the upscale hotels. *Journal of Hospitality & Tourism Research, 32*(2), 209–234. https://doi.org/10.1177/1096348007313264.

Pedroso, E., & Gomes, C. F. (2020). The effectiveness of management accounting systems in SMEs: A multidimensional measurement approach. *Journal of Applied Accounting Research, 21*(3), 497–515. https://doi.org/10.1108/JAAR-05-2018-0059.

Rao, Y., Guo, K. H., & Chen, Y. (2015). Information systems maturity, knowledge sharing, and frm performance. *International Journal of Accounting & Information Management, 23*(2), 106–127. https://doi.org/10.1108/IJAIM-11-2013-0060.

Ratmono, D., Frendy & Zuhrohtun, Z. (2023). Digitalization in management accounting systems for urban SMEs in a developing country: A mediation model analysis. *Cogent Economics & Finance, 11*(2), 1-22. https://doi.org/10.1080/23322039.2023.2269773.

Rojas Ortiz, Z.X. (2024). Cybersecurity and Cyber Defense in the Light of New Technologies in Cyberspace. In: Olmedo Cifuentes, G.F., Arcos

Avilés, D.G., Lara Padilla, H.V. (eds) *Emerging Research in Intelligent Systems. CIT 2023. Lecture Notes in Networks and Systems*, vol 903 (pp 15–29). Springer, Cham. https://doi.org/10.1007/978-3-031-52258-1_2.

Rutkowska, M., & Sulich, A. (2020). Green Jobs on the background of Industry 4.0. *Procedia Computer Science, 176*, 1232–1240. https://doi.org/10.1016/j.procs.2020.09.132.

Saleem, B., Ahmed, M., Zahra, M., Hassan, F., Iqbal, M. A., & Muhammad, Z. (2024). A survey of cybersecurity laws, regulations, and policies in technologically advanced nations: a case study of Pakistan to bridge the gap. *International Cybersecurity Law Review, 5*, 533–561. https://doi.org/10.1365/s43439-024-00128-y.

Saleh, Q. Y., & Al-Nimer, M. B. (2022). The mediating role of the management accounting information system in the relationship between innovation strategy and financial performance in the Jordanian industrial companies. *Cogent Business & Management, 9*(1), 1-28. https://doi.org/10.1080/23311975.2022.2135206.

Sargsyan, G. (2024). Cybersecurity as a Backbone for Sustainability. 2024 IEEE International Conference on Cyber Security and Resilience (CSR), London, United Kingdom, 02-04 September 2024, pp. 526-530. doi: 10.1109/CSR61664.2024.10679426.

Sarstedt, M., Hair, J. F., Pick, M., Liengaard, B. D., Radomir, L., & Ringle, C. M. (2022). Progress in Partial least Squares structural Equation modeling use in Marketing research in the Last Decade. *Psychology & Marketing, 39*(5), 1035–1064. https://doi.org/10.1002/mar.21640.

Scott, W.R. (2014). *Institutions and Organizations: Ideas, Interests, and Identities*. Thousand Oaks, CA: Sage Publications.

Secchi, D., Grimm, V., Herath, D. B., & Homberg, F. (2024). Modeling and theorizing with agent-based sustainable development. *Environmental Modelling & Software, 171*, 1-12. https://doi.org/10.1016/j.envsoft.2023.105891.

Seng, N. (2024). Cybersecurity Regulation—Types, Principles, and Country Deep Dives in Asia. *International Cybersecurity Law Review, 5*, 387–411. https://doi.org/10.1365/s43439-024-00127-z.

Shahana, A., Hasan, R., Farabi, S. F., Akter, J., Al Mahmud, M. A., Johora, F. T., & Suzer, G. (2024). AI-Driven Cybersecurity: Balancing Advancements and Safeguards. *Journal of Computer Science and Technology Studies, 6*(2), 76-85. https://doi.org/10.32996/jcsts.2024.6.2.9.

Singh, S. K., & El-Kassar, A. N. (2019). Role of big data analytics in developing sustainable capabilities. *Journal of Cleaner Production, 213*, 1264–1273. https://doi.org/10.1016/j.jclepro.2018.12.199.

Srinivas, J., Das, A. K., & Kumar, N. (2019). Government regulations in cyber security: Framework, standards and recommendations. *Future Generation Computer Systems, 92*, 178-188. https://doi.org/10.1016/j.future.2018.09.063.

Sulich, A., Rutkowska, M., Krawczyk-Jezierska, A., Jezierski, J., & Zema, T. (2021). Cybersecurity and sustainable development. *Procedia Computer Science, 192*, 20–28. https://doi.org/10.1016/j.procs.2021.08.003.

Uriarte-Gallastegi, N., Landeta-Manzano, B., Sigüenza-Tamayo, W., Laskurain-Iturbe, I., Arana-Landín, G. (2024). Cybersecurity Integration in the Circular Economy: Maximizing Sustainability in Industry 4.0. In: Thürer, M., Riedel, R., von Cieminski, G., Romero, D. (eds) *Advances in Production Management Systems. Production Management Systems for Volatile, Uncertain, Complex, and Ambiguous Environments. APMS 2024. IFIP Advances in Information and Communication Technology*, vol 728 (pp 202–216). Springer, Cham. https://doi.org/10.1007/978-3-031-71622-5_14.

van Slooten, A. C. A., Dirks, P. M. G., & Firk, S. (2024). Digitalization and management accountants' role conflict and ambiguity: A double-edged sword for the profession. *The British Accounting Review*, 1-22. https://doi.org/10.1016/j.bar.2024.101460.

Vrchota, J., Pech, M., Rolínek, L., & Bednář, J. (2020). Sustainability outcomes of green processes in relation to industry 4.0 in manufacturing: Systematic review. *Sustainability, 12*(15), 1-47. https://doi.org/10.3390/su12155968.

Wang, D., Si, R., & Fahad, S. (2023). Evaluating the small and medium sized enterprises motivating factors and influencing barriers about adoption of green practices. *Environment, Development and Sustainability, 25*, 3029–3041. https://doi.org/10.1007/s10668-022-02166-0.

Ylä-Kujala, A., Kouhia-Kuusisto, K., Ikäheimonen, T., Laine, T., & Kärri, T. (2023). Management accounting adoption in small businesses: interfaces with challenges and performance. *Journal of Accounting & Organizational Change, 19*(6), 46-69. https://doi.org/10.1108/JAOC-07-2022-0100.