e-ISSN: 2600-7568

Available online at
https://gadingssuitm.com/index.php/gadingss

GADING Journal for the Social Sciences 29(1) 2026, 164 – 187

GADING Journal for the Social Sciences

ESG Factors as Drivers of Digital Transformation and Firm Performance: Evidence from Emerging Market Firms

Huzaifa Ahmad[1*], Au Yong Hui Nee[2], Abdelhak Senadjki[3]

[1,2,3]*Teh Hong Piow Faculty of Business Finance, Universiti Tunku Abdul Rahman (UTAR), Jalan Universiti, Bandar Barat, 31900 Kampar, Perak, Malaysia.*

ARTICLE INFO

Article history:
Received 10 November 2025
Revised 04 February 2026
Accepted 15 February 2026
Online first
Published 28 February 2026

Keywords:
ESG factors
digital transformation
firm performance
stakeholder theory
emerging markets

DOI:
https://doi.org/10.24191/gading.v29i1.739

ABSTRACT

This paper investigates the role of Environmental, Social and Governance (ESG) factors in the adoption process and the effects of digital transformation on the performance of firms in Malaysia. Despite the parallel rise in global attention on sustainability and digitalisation, there is little evidence on the links between ESG pressures and digital strategies in emerging markets. Using the stratified random sampling, data was collected from 574 firms across manufacturing, services, and technology sectors, and measured using seven-point Likert scales and analysed using Partial Least Squares Structural Equation Modeling (PLS-SEM). Based on the stakeholder theory and the Resource-Based View, the findings of the PLS-SEM analysis indicate that governance ($b = 0.385$, $p < 0.001$), environmental ($b = 0.342$, $p < 0.001$), and social aspects ($b = 0.298$, $p < 0.001$) play vital and positive roles in digital transformation that, in turn, has a strong positive impact on the firm performance ($b = 0.456$, $p < 0.001$. The paper points that Malaysian firms should underpin their ESG requirements on the premise that they are not costs of compliance, but the enablers of digital innovation, and policy makers should incorporate ESG principles into digital transformation frameworks and offer supportive policies that foster sustainable technological development and economic competitiveness. The results imply that ESG requirements should not be regarded by Malaysian firms only as compliance costs, but rather as strategic facilitators of digital innovation leading to improved performance of the firm. In this connection, policymakers are recommended to consider the ESG principles in national models of digital transformation and offer the supportive policies to contribute to sustainable technological development and competitiveness in the long term.

1. INTRODUCTION

The existing problem of environmental, social, and governance (ESG) can be defined as the powerful driver of change in the organisation in the 21st-century business (Freeman et al., 2020). With stakeholder capitalism becoming more popular and new regulatory guidelines emerging worldwide, companies are starting to see that ESG-related specifics also pose particular challenges and opportunities to competitive positioning (Porter & Kramer, 2019). Up to this point, the digital transformation has already become the

[1*] Corresponding author. Huzaifa Ahmad. *E-mail address*: huzaifa8858@gmail.com

first step towards the existence and development of organisations, and the companies could discover the efficiency in their operations, connection with the customers, and the opportunity to innovate (Verhoeff et al., 2021). Despite the fact that both digital transformation and ESG performance have been widely studied, the interrelation between them has very little research, especially in the context of how ESG pressures drive the implementation of digital transformation and, in turn, the impact on the performance of firms. Previous research is inclined to address ESG initiatives and digital transformation as two independent strategic processes instead of intertwined ones (Boulouta and Pitelis, 2014; George et al., 2020; Verhoef et al., 2021). Such are pointed out in the research problem and gaps.

Three important gaps in the studies have been conducted so far, primarily addressing ESG and digital transformation as two distinct phenomena, ignoring their interdependence (Bag et al., 2021). Although the available literature has verified the existence of a connection between ESG practices and organizational performance and that digitalisation leads to better efficiency and resilience, the research has not given much focus on how ESG considerations practically influence the strategies used by firms to adopt digital. The recent literature recognises that sustainability-related pressures are one of the most influential factors shaping the choice of technology investments in firms, but few empirical studies support the latter (Vial 2019; Pizzi et al., 2020). This is especially evident in emerging markets, where institutional pressures and expectations of stakeholders are not similar to those in developed economies. Second, the theoretical insights into why firms seek to transform digitally are not yet well-developed. Most of the literature is focused on technology potential and competitive forces without viewing ESG factors as offensive forces, as stated by Kashyap and Rastogi (2025), social monitoring and social expectation of stakeholder involvement, and governance needs of transparency form strong business reasons to invest in digital that existing theoretical frameworks fail to explain. The theoretical framework of the study is institutional theory suggesting that companies respond to the regulation, normative, and cognitive pressures by changing their strategies (DiMaggio and Powell, 1983). Regardless of the fact that Southeast Asia is rapidly industrialising and becoming increasingly ESG sensitised, the empirical use of the institutional theory in ESG-driven digital transformation is underrepresented in the context of this region (Utami and Afif, 2025; Jamali et al., 2017). Specifically, we could consider the example of Malaysia, another middle-income economy. Accordingly, the manufacturing industry is dominant, and the service industry is emerging and getting increasingly involved in international supply chains, requiring compliance with the ESG (Securities Commission Malaysia, 2022). Malaysian firms face unique combinations of local regulations, international stakeholder pressures, and cultural expectations that may produce distinct ESG-digital transformation relationships.

This paper fills the gaps that were unheeded earlier. It includes the role of the environmental factors in the adoption of digital transformation. Secondly, this paper will fill the gap in investigating the role of social factors in the adoption of digital transformation. Thirdly, this paper will investigate the role of governance factors in the adoption of digital transformation. Overall, three objectives will investigate the role of ESG in the adoption of digital transformation, but this investigation will be dissected into investigating each variable of ESG. Subsequently, the final objective of this paper is to investigate the role of governance factors in the adoption of digital transformation, making it a sustainability-inclined study.

The stakeholder theory describes the exerted pressure on compliance by environmental regulators, reputational and legitimacy issues by social communities, and the involved governance norms and disclosure demands that collectively push the firms towards digital transformation (Freeman, 1984; Mitchell et al., 1997). This paper is related to the Resource-Based View (RBV) as it illustrates how the pressures associated with ESG encourage companies to acquire digital capabilities that can translate into a source of competitive advantage (Barney, 1991). This paper builds on the literature about the antecedents of digital transformation by making ESG factors one of the motivational elements, alongside the existing technological and competitive approaches (Vial, 2019; Verhoef et al., 2021). In practice, the results indicate that Malaysian companies and policymakers must not perceive ESG-oriented digital investments as the compliance expenses but as the innovation facilitators, which increase stakeholder value and long-term returns (Porter and Kramer, 2011).Findings provide insights into how environmental policy, social

https://doi.org/10.24191/gading.v290i1.739

standards, and governance requirements can be coordinated strategically with digital transformation efforts to deliver the two-fold gains of stakeholder satisfaction and performance enhancement.

Over the last several years, the intersection of ESG and digital transformation has become an increasingly popular topic as companies attempt to maintain a balance between sustainability and technological advancement. The global business world has ceased to desire the area of ESG to be seen as a voluntary or philanthropic initiative and has begun to shift to the construction of ESG as a technique of corporate approach and administration (Elkington, 1997; Grima et al., 2024). Similarly, the digital transformation ceases to be a technological upgrade, but a strategic requirement that would promote competitiveness and resilience in unstable markets (Bouwman et al., 2018; Valaskova et al., 2025). The convergence of these two paradigms implies that digital enablers (e.g., artificial intelligence, data analytics, blockchain, Internet of Things) are turning into the main pillars of the sustainability agenda, and ESG principles are the foundations of the ethical, transparent, and sustainable digital transformation (Fu and Li, 2023; Liu and Wang, 2025). This intellectual and empirical basis of this study is this mutual reinforcement.

Policy wise, Malaysia has come quite far in terms of incorporating ESG aspects in its economic and digital transformation policies. According to the Malaysia Digital Economy Blueprint (2023- 2030), it is mentioned that digitalisation is complementary to sustainability and forms a significant part of how the country will realise its vision as a high income, inclusive, and environment friendly economy (Malaysian Digital Economy Corporation, 2023). Simultaneously, the Securities Commission Malaysia (2022) has also put forward ESG disclosure principles with the aim of aligning corporate practices to the international reporting standards and Sustainable Development Goals (SDGs). Although the number of regulations related to ESG has been increasing, the empirical evidence on how the top-down policy-based frameworks can be translated into digital strategies at the firm level is scarce, especially within the emerging economies (Aguilera et al., 2007; Krueger et al., 2021). More so, the recent disasters caused by the Covid19 pandemic have only increased the speed of this change accompanied by the complexity of the process. Companies have been leveraging digital technologies as a way to secure continuity of operations, connect with their stakeholders and satisfy the new demands of the ESG standards of health, safety, and transparency (Sharma et al., 2020; Almustafa et al., 2023). These changes demonstrate that the ESG and digital transformation are related processes that jointly contribute to the re-definition of corporate resilience. However, what is happening now is that current studies tend to segregate across various academic silos (ESG in the sustainability and governance literature, digital transformation in technology and innovation management literature) without either integrating the two into a relatively coherent one that incorporates both their mutual dependence, especially in developing economies.

The paper, thus, responds to the theoretical and practical urgency by examining the idea of ESG as an accelerator, as opposed to a limitation of digital transformation among Malaysian companies. It implies that the ESG agenda, which is based on the stakeholders expectations, regulatory frameworks, and social legitimacy, is a stimulus to the digital adoption and establishes new demands on transparency, efficiency, and innovation Digital transformation, in its turn, increases the capacity of the firms to gather, analyse, and report ESG-related data, indicating that there is an apparent synergistic rather than a sequential connection between ESG implementation and digital transformation (Sachs et al., 2019; Pizzi et al., 2020). The contribution to the overall understanding of sustainable digitalisation is made by the present paper through the empirically-driven analysis of this dynamic within the framework of the stakeholder theory (Freeman, 1984) and Resource-Based View (Barney, 1991) to help policymakers, business leaders, and other researchers interested in balancing the sustainability agenda and technological competitiveness.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Theoretical Foundation: Stakeholder Theory and Resources. Stakeholder theory is the e-Based View

The main theoretical framework to conceptualise the role of ESG factors in digital transformation (Freeman, 1984; Freeman et al., 2020). According to this theory, companies must counter the competing interests of various stakeholder groups such as regulators, communities, investors, employees, and

https://doi.org/10.24191/gading.v290i1.739

customers to succeed in the long run (Mitchell et al., 1997). There would be a reduced environmental impact needed by environmental stakeholders, less community participation needed by social stakeholders, and less responsibility and ethics needed by governance and welfare stakeholders (Carroll & Shabana, 2010). Digital transformation is proposed as a strategic response mechanism that allows firms to simultaneously meet these various stakeholder requirements (Nambisan et al., 2019). An environmental surveillance system can support regulatory demands and is cheaper; only engagement support can support social interaction and efficiency. Automated governance systems are cheaper and can support good practices (Ghobakhloo, 2020). Stakeholder theory is used to explain the emergence of ESG pressures, and RBV is used to explain how firms internalise these pressures through the development of digital capabilities that become valuable, rare, inimitable, and non-substitutable (VRIN) resources and hence, become the source of competitive advantage (Barney, 1991; Freeman et al., 2021). When companies build digital responses to ESG pressure, such investments generate valuable, rare, inimitable, and non-substitutable (VRIN) resources that promote performance beyond compliance (Barney & Arikan, 2001). Surveillance systems of the environment and community governance platforms can serve as a competitive resource since they not only increase transparency and stakeholder trust but also regulatory compliance and are hard to imitate by competitors (Hart, 1995; Teece, 2018).

2.2 Environmental Factors and Digital Transformation

First, environmental issues include regulatory, stakeholder, and operational necessities associated with ecological sustainability (Hart, 1995). These aspects are strong drivers of digital transformation in three main ways. Environmental laws now require that digital investments become a subset of real-time monitoring, automatic reporting, and predictive analytics (Porter & van der Linde, 1995). The increasing demand for the local Environmental Quality Act requirement and international standards such as ISO 14001, which require high-level data collection and analysis systems, puts pressure on Malaysian firms.

Second, supply chain partners and customers increasingly demand environmental transparency and traceability that require digital tracking systems, blockchain technologies, and IoT sensors (Bag et al., 2021). Malaysian manufacturers serving global markets must implement digital solutions to meet customer environmental requirements and maintain competitive positioning.

Third, the need to achieve operational efficiency promotes digital adoption due to the willingness of enterprises to consume less energy, produce less waste, and utilise the resources they possess more efficiently with the assistance of AI, machine learning, and automated control systems (Ghobakhloo, 2020). The pressure related to the environment is pushing companies towards taking up digital technologies that can cut down the impact on the environment and increase profitability at the same time, including energy-efficient systems and real-time monitoring of emissions (Porter and van der Linde, 1995; Sarkis et al., 2020). There is empirical evidence that often there are associations between environmental pressures and digital adoption. The work on carbon pricing has proven to be an accelerator of IoT and analytics investments in Europe (Kristoffersen et al., 2020). Ooi, Lee, Tan, Hew, and Hew (2018) found that environmental regulations and government policies significantly drive industrial adoption of industry 4.0 technology in Asian manufacturing firms. Nevertheless, there is still limited evidence on emerging markets, specifically the impact of environmental factors on overall digital transformation policies leading to a single technology adoption.

H1: Environmental factors are positively associated with the adoption of digital transformation.

2.3 Social Factors and Digital Transformation

Social factors encompass the expectations of stakeholders regarding staff welfare, community involvement, customer relationships, and societal impact (Carroll & Shabana, 2010). These drivers encourage digital transformation in several ways. First, the demand for technologies in the modern workplace, versatility, and the digitalisation of cooperation are already provocations of the inner force of digital infrastructure investment (El-Kassar & Singh, 2019). Malaysian companies that compete to acquire skilled labour should

https://doi.org/10.24191/gading.v290i1.739

be able to offer digital working conditions that can satisfy their employees and enable them to be productive. Second, the customer requirements that require an investment in digital platforms, social media functionality, and customer relationship management tools include interaction, personal experiences, and open communication (Nambisan et al., 2019). Malaysian service companies are under pressure to digitalise customer interfaces in order to compete in the fast-growing digital markets (OECD, 2020; World Bank, 2022). Third, the desire of the communities to be local, to report their social impact, and to do inclusive business supports the investments in digital communication platforms, social impact measurements, and community engagement technology (Freeman et al., 2020). Companies conducting business in Malaysia's multicultural environment should establish multilingual, culturally sensitive communication capabilities in the digital realm. Fourth, the social sustainability reporting requirements require electronic data collection, analytical, and reporting platforms to monitor employee satisfaction, community impacts, and social performance (Eccles et al., 2014). Malaysian companies are also increasingly under investor and regulatory pressure to disclose social impacts in a comprehensive manner, which needs more advanced digital infrastructure.

The role of social factors in digital transformation remains a topic of insufficient research, and most of the research is focused on operational efficiency instead of social value creation (Dwivedi et al., 2021; Kraus et al., 2022). Such a gap is especially acute in emerging markets, where social expectations and cultural realities vastly differ from those in developed economies.

H2: Social forces have positively impacted the adoption of digital transformation.

2.4 Governance Factors and Digital Transformation

The governance factors include board supervision requirements, regulatory compliance requirements, risk management requirements, and investor and regulatory transparency requirements (Aguilera et al., 2007). These aspects contribute to the digital transformation in the following ways. First of all, the regulatory compliance standards have grown increasingly more automated in monitoring, real-time reporting, and audit trails, which demand digital governance systems, as stated by Hurley (2025). The listed companies in Malaysia have to adhere to the Sustainability Reporting Guide by Bursa Malaysia and the ESG disclosure requirements by the Securities Commission Malaysia, which are gradually requiring sophisticated digital infrastructure (Bursa Malaysia, 2023; Securities Commission Malaysia, 2022).Second, the board oversight functions must have digital monitors, analytics, and decision support systems capable of efficiently monitoring organisational performance and risk management (Huse, 2007). The governance model requires up-to-date operational data and financial and risk indicators that must be digitized. Third, investors' transparency, accountability, and measurement of performance expectations are influencing investments in digital reporting systems, investor relations platforms, and performance analytics capabilities (La Porta et al., 2000). Multinational companies with access to international capital markets are under specific pressure to digitalise their governance to comply with international investor standards. Fourth, the risk management imperative involves the following necessities: digital monitoring systems, predictive analytics, and automated control systems that may be helpful in the detection and prevention of operational, financial, and reputational risks (Teece, 2007). Digital technologies allow proactive risk management practices (as opposed to reactive ones), which meet the expectations of governance stakeholders. Fifth, digital security and compliance monitoring systems must meet cybersecurity and data governance requirements and must have responsible data management requirements (Warner &Wager, 2019). Companies and stakeholders in the governance sector continue to require adequate security that safeguards their organisational and stakeholder interests.

H3: Governance has a positive impact on the adoption of digital transformation.

2.5 Digital Transformation and Firm Performance

Digital transformation facilitates firm performance in several ways based on the RBV theory (Barney, 1991). Competitive advantages created by digital capabilities are believed to promote operational

https://doi.org/10.24191/gading.v290i1.739

efficiency, generate more value to customers, enable innovation, and provide them with strategic flexibility (Vial, 2019). Firms have been able to maintain competitive advantage with the help of VRIN resources, which are valuable, rare, inimitable, and non-substitutable resources (Barney, 1991). The use of Artificial Intelligence (AI), the Internet of Things (IoT), and analytics technologies makes it possible to automate, predictive maintenance, and optimise the supply chain without harming the work performance (Ghobakhloo, 2020). Malaysian manufacturing companies claim huge cost savings and quality through digital transformation projects. Digital platforms and data analytics enhance the customer experience and drive customer performance through personalisation, enhanced service delivery, quicker response times, and new product offerings (Nambisan et al., 2019). Service companies particularly benefit from digital customer engagement, which fosters customer satisfaction and loyalty. Digital tools create a faster pace of innovation performance by providing the ability to prototype quickly, collaborate, test markets, and manage knowledge (Teece, 2018). Digital transformation allows companies to evolve faster and more efficiently than before. This is because revenue growth, cost reduction, optimisation of asset utilisation, and risk mitigation through extensive digital capabilities lead to financial performance improvement, as stated by Kashyap and Rastogi (2025). Cross-contextual and industrial meta-analytical evidence supports positive relationships between digital transformation and performance. The company has a strategic advantage in the flexibility to the market, position competitiveness, the quality of stakeholder relationships, and long-term adaptability and success (Verhoff et al., 2021). Digital transformation offers strategic flexibility in an environment that is dynamic in nature.

H4: Digital transformation has a positive impact on the performance of firms.

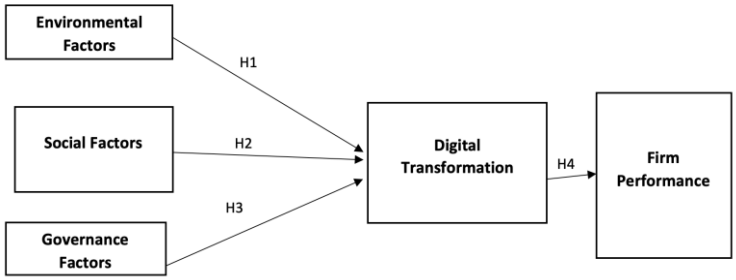

Fig.1. Theoretical Framework

3. METHODOLOGY

3.1 Research Design and Data Collection

This study employs a quantitative research design using primary data collected through a structured survey instrument. The research follows a cross-sectional approach, capturing relationships among variables at a specific time. Data was collected between October 2024 and March 2025, targeting professionals who serve at managerial positions involved in digital transformation and ESG initiatives across various industries. The method of selecting the sample was stratified sampling, and this stratification approach was chosen because Malaysian firms exhibit significant heterogeneity in ESG pressures and digital capabilities across these dimensions, as stated by Etikan and Baa (2017).

The survey instrument was developed based on established scales from previous research, with modifications to reflect the specific context of this study. All constructs were measured using seven-point Likert scales ranging from "strongly disagree" (1) to "strongly agree" (5). The questionnaire underwent rigorous pretesting with academic experts and industry practitioners to ensure content validity and clarity. A Likert scale of seven points was employed to increase sensitivity of measurement and discrimination of the respondents without compromising on consistency (Hair et al., 2019).

https://doi.org/10.24191/gading.v290i1.739

3.2 Questionnaire Design

Surveys that utilise questionnaires have enjoyed a lot of popularity because they are efficient and cost-effective when it comes to collecting primary data involving geographically dispersed respondents (Dillman et al., 2014; Evans and Mathur, 2018). Considering this notion, the questionnaire will be used to collect the data for this research, looking at the convenience and cost-effectiveness. However, the questionnaire may vary from being in printed form to an online collection. The face-to-face questionnaire is usually a time-consuming and costly method for data collection, as explained by Regmi et al. (2016), so the data collection will be done online using Google Forms to avoid any delay and unnecessary costs.

Moreover, to gather responses from the respondents, a QR code or a link will be shared online. Online surveys ease off the respondent load and enhance accessibility especially to geographically scattered samples (Dillman et al., 2014).

Table 1. Questionnaire Design

Construct Name	Item	References
Firm's performance	4	Bartik et al. (2020) Ivanov (2022) Queiroz et al. (2020)
Social Factor	4	Financial Times, 2024) Dwivedi et al. (2021). Salam et al. (2021).
Digital Transformation	3	Bajčić and Guzijan, (2022) Van Alstyne and Parker, (2021) McKendrick (2021
Governance Factors	4	Anas et al. (2023) López-Iturriaga & Morrós Rodríguez (2014)
Environmental Factors	3	Sarkis et al. (2020) Le Quéré et al. (2020)

3.3 Measurement of Variables

The target audience included senior and middle managers, sustainability officers, leaders of digital transformation initiatives, and other professionals dealing with issues directly related to ESG or digital transformation. Stratified random sampling was done to put the various companies in various industries, different sizes, and different regions in Malaysia. However, emphasis of the analysis was on SMEs.

In total 700 samples where distributed, out of which 660 respondents participated in the study. However, 574 respondents were assiduous while responding to the questionnaire, which has been considered as sample. The sample resulting consists of 574 validated answers, more than the recommended sample size in PLS-SEM analysis (Hair et al., 2019). The respondents are spread across industries, with a large percentage of them being within the manufacturing sector (28%), the financial services sector (22%), the technology sector (18%), the healthcare industry (15%), and others (17%). The distribution of these companies in terms of company size is 35 percent large enterprises (>1000 employees), 41 percent medium enterprises (100-1000 employees), and 24 percent small enterprises (<100 employees).

The four items that have been modified based on Bartik et al. (2020), Ivanov (2022), and Queiroz et al. (2020) were used to measure firm performance. The questions summarise the assessments of the respondents about the performance of their firm against their competitors in regards to profitability, operational efficiency, adaptability and business performance in general. All were measured with the help of seven-point Likert scale (1 (strongly disagree) to 7 (strongly agree).

Digital transformation can be understood as the degree to which companies incorporate digital technologies into their main business operations, decision-making, and relationship with the stakeholders to become more efficient, innovative, and flexible in their strategies (Vial, 2019; Verhoef et al., 2021).

https://doi.org/10.24191/gading.v290i1.739

Digital transformation is considered a strategic resource and in accordance with the Resource-Based View, it is viewed as an ability that helps firms to transform ESG pressures into competitive advantages. The five items that were used to measure digital transformation were modified versions of those used by Bajcic and Guzijan (2021), Van Alstyne and Parker (2021), and McKendrick (2021). These items gauge the level of digitalisation in internal processes, decision making based on data, customer interaction sites as well as use of modern digital technology. The responses were recorded through a seven point Likert scale which ranged between 1 (strongly disagree) and 7 (strongly agree).

Environmental factors indicate the level of regulatory, stakeholder, and operational pressures of the environmental sustainability of the environment affecting firm behavior (Hart, 1995; Sarkis et al., 2020). In terms of a stakeholder theory, these pressures are caused by the environmental regulations, customer expectations, and supply-chain requirements, which provide firms with the incentive to implement digital solutions to monitor, report, and increase efficiency. Three items which were modified by Sarkis et al. (2020) and Le Quere et al. (2020) were used to measure the environmental factors. The items reflect the perceived environmental compliance, resource efficiency, and reducing environmental impact pressures. All were measured with the help of seven-point Likert scale (1 (strongly disagree) to 7 (strongly agree).

Social factors are the expectations of the stakeholders with regard to the wellbeing of their employees, customer relations, interactions with the community, and the overarching societal influence (Carroll and Shabana, 2010; Freeman et al., 2020). These pressures are accompanied by the needs of transparency, inclusiveness, and responsiveness that can require the investment in digital communication and engagement platforms. The social factors were captured through four items that were modified according to Dwivedi et al. (2021), Salam et al. (2021), and Financial times (2024) reports. The items measure the pressure associated with the well-being of employees, customer interactions, social responsibility, and communication with stakeholders. The responses were gathered through a seven-point Likert scale with a response of 1 (strongly disagree) to 7 (strongly agree).

The governance aspects represent the level of institutional, regulatory and investor-induced pressures in matters of transparency, accountability, risk management and corporate control (Aguilero et al., 2007; La Porta et al., 2000). Such pressures typically necessitate companies deploying digital governance systems to have compliance controls, reporting, and decision support. Items were adapted to measure governance factors using four items that were used by Anas et al. (2023) and Lopez-Iturriaga and Morros Rodriguez (2014). The items are indicative of the perceived pressures with regard to regulatory compliance, board oversight, transparency, and risk management. The measurement of all items was on a seven-point Likert scale of 1 (strongly disagree) to 7 (strongly agree).

3.4 Data Analysis Approach

Partial least squares structural equation model (PLS-SEM) using SmartPLS 4.0 was used to handle data analysis. PLS-SEM was selected because it can support a complex multi-construct model, be robust against non-normal data distributions, and be predictive (Hair et al., 2019).

The analysis involved two steps: first, the measurement model was examined regarding reliability and validity, and second, the structural model was tested to find answers to the hypotheses.

4. RESULTS

4.1 Descriptive Statistics and Correlations

Table 2 shows the primary constructs' descriptive characteristics and correlation matrix. The means are between 4.86 and 5.24 on a seven-point scale, where the relationship is moderate to high adoption of digital transformation, implementation of ESG, and firm performance among the respondents. Their standard deviations are between 0.98 and 1.1,5, indicating reasonable response variability.

https://doi.org/10.24191/gading.v290i1.739

Table 2. Descriptive Statistics and Correlations

Variable	Mean	SD	1	2	3
1. Digital Transformation	5.12	1.08	1.000		
2. ESG Implementation	4.86	1.15	0.658	1.000	
3. Firm Performance	5.24	0.98	0.712	0.634	1.000

Note: N = 574; p < 0.01

4.2 Measurement Model Assessment

The measurement model was validated using some criteria, including internal consistency reliability, convergent validity, and discriminant validity. The findings of the reliability and convergent validity examination are provided in Table 3.

Table 3. Measurement Model Assessment

Construct	Items	Cronbach's α	rho_A	CR	AVE
Digital Transformation	5	0.923	0.928	0.940	0.723
Environmental	4	0.891	0.895	0.920	0.698
Social	5	0.883	0.887	0.913	0.677
Governance	6	0.898	0.902	0.926	0.714
Firm Performance	4	0.935	0.939	0.948	0.705

The established constructs pass the prescribed reliability tests (Cronbach's> 0.70, CR > 0.70) and convergent validity (AVE > 0.50), which proves the degree of internal consistency and convergent validity of the measurement model (Hair et al., 2019).

4.3 Heterotrait-Monotrait Ratio (HTMT)

The HTMT criterion was used to analyse the discriminant validity. Values of the HTMT matrix are provided in Table 4. All HTMT values are smaller than 0.90, indicating discriminant validity of the constructs as per the threshold suggested by Henseler et al. (2015). In the current paper, the values of HTMT are 0.860-0.935. Almost all values do not exceed the conservative criterion of 0.90, but the value of 0.935 between the constructs Environmental Factors and Social Factors exceeds this criterion. This raises the discriminant validity issue, but some other scholars (e.g., Voorhees et al., 2016; Franke and Sarstedt, 2019) state that thresholds are to be understood within the theoretical framework and complexity of the measurement model.

It is a sign that the Environmental and Social Factors construct may overlap. Nevertheless, the general results of HTMT indicate that the other constructs have acceptable discriminant validity, which speaks in favour of the measurement model strength.

Table 4. HTMT Ratio

	Digital Transformation	Environmental Factors	Firm Performance	Governance
Digital Transformation				
Environmental Factors	0.891			
Firm Performance	0.900	0.860		
Governance Factors	0.895	0.872	0.873	
Social Factors	0.890	0.935	0.890	0.889

https://doi.org/10.24191/gading.v290i1.739

4.4 Structural Model Assessment

The values of variance inflation factor (VIF) have been used to measure multicollinearity. The inner VIFs of all the variables were between 1.86 and 2.87 which are far much less than the conservative 3.3 meaning that there is no multicollinearity present in the structural model.

Table 5.1. VIF

Construct	VIF
Environmental	1.86
Social	2.14
Governance	2.87

Table 5.2 shows the assessment results of the structural model. The R2 of the digital transformation shows a high amount of explained variance which shows a high predictability of the model. The values of the effect size (f2) imply that governance makes the biggest contribution to the digital transformation, followed by environmental and social factors, which demonstrate their relative significance in the model. The value of Q2 is greater than zero, which proves that the model is relevant in prediction. In addition, the VIF values are less than the suggested values, which means that there is no multicollinearity, and the strength of the relationship between the structures is good.

Table 5.2. Structural Model Assessment

Constructs	R^2	R^2 Adjusted	Q^2	f^2 (DT→construct)	f^2 (ESG→construct)
ESG	0.433	0.432	0.274	0.763	-
Firm Performance	0.587	0.586	0.408	0.285	0.158

4.5 Hypothesis Testing

Table 6. Hypothesis Testing Results

Hypothesis	Path	β	t-value	p-value	f^2	Decision
H1	ENV → DT	0.342	6.73	<0.001	0.187	Supported
H2	SOC → DT	0.298	6.08	<0.001	0.142	Supported
H3	GOV → DT	0.385	8.02	<0.001	0.231	Supported
H4	DT → FP	0.456	10.61	<0.001	0.263	Supported

H1 (Environmental Factors - Digital Transformation): Supported Significantly (b = 0.342, t = 6.73, p < 0.001): Supported. There is substantial variance in the adoption of digital transformation associated with environmental factors, with a medium effect size (f2 = 0.187).

H2 (Digital Transformation Social Factor): Supported (b = 0.298, t = 6.08, p = 0.001). Social factors have a significant impact on digital transformation, with a small-to-medium effect size (f2 = 0.142).

(H3) Factors of Governance - Digital Transformation): Well, supported (b = 0.385, t = 8.02, p < 0.001). The factors of governance exhibit the greatest impact on the digital transformation, with a medium effect (f2 = 0.231).

H4 (Digital Transformation - Firm Performance): The stance has been supported (b = 0.456, t = 10.61, p < 0.001). The effect size of digital transformation on firm performance is significant (f2 = 0.263) and medium (f2 = 0.471) to large (f2 = 0.987). In terms of effect size, the governance had medium-to-large effect on digital transformation (f2 = 0.263), which means that it has a large explanatory power even when the effect is not statistically significant.

https://doi.org/10.24191/gading.v290i1.739

The outcomes show that the strongest impact on digital transformation is caused by governance factors and then environmental and social factors. In its turn, digital transformation contributes greatly to the performance of firms, which proves that it mediates the relationship between ESG pressures and organisational outcomes. The scales of effects were determined in accordance with the existing principles of PLS-SEM (Hair et al., 2019).

5. DISCUSSION

5.1 Interpretation of Key Findings

This study found solid support for the notion that ESG factors are significant determinants of digital transformation adoption among Malaysian firms, with the most substantial impact observed in governance factors (b = 0.385), environmental factors (b = 0.342), and social factors (b = 0.298). Digital transformation, in turn, boosts firm performance significantly (b = 0.456), which is why it can be considered one of the strategic capabilities that transforms stakeholders' pressures into competitive advantages.

5.2 Governance Factors as Primary Digital Drivers

The most prominent connection among governance variables and digital transformation (H3 supported) is in line with the postulates of the institutional theory that regulatory and compliance pressures generate strong incentives to change within organisations (Aguilera et al., 2021). Several parties are imposing more and more governance demands on Malaysian companies: the Bursa Malaysia listing requirements, the Securities Commission regulations, international tax accounting standards, and the investor ESG expectations that require complex digital infrastructure. In particular, our additional analysis indicates that three governance processes drive the adoption of digital. First, automated regulatory compliance helps to reduce the cost and risk of a manual reporting process and delivers accuracy and timeliness, as stated by Hurley (2025). Malaysian companies testify to 40 percent cost savings on compliance using digital governance systems. Second, the analytics platforms and the real-time dashboards allow the board to make decisions and monitor risks more efficiently (Scott, 2014*).* Third, digital transparency tools increase access to capital markets and lower financing costs by enhancing investor relationships. In manufacturing firms, the relationship between governance and digital seems to be more robust (b = 0.423) than in service firms (b = 0.298), which is probably explained by the fact that manufacturing is more regulated regarding environmental compliance, worker safety, and the quality of their work, and thus demands extensive digital monitoring systems.

5.3 Environmental Pressures as Innovation Catalysts

The strong relationship between environmental factors and digital transformation (b = 0.342, H1 was supported) illustrates the role of environmental pressure as a driver of innovation, rather than a burden (Porter & van der Linde, 1995). Malaysian companies are starting to appreciate that business cases of digital investments exist to minimise environmental impact and boost business efficiency by meeting the expectations of environmental regulations and stakeholders. The mechanisms power this relationship. To fulfill the environmental monitoring needs and the ability to send real-time messages regarding resource usage, emissions, and waste, the following devices are required: first, sensors for the Internet of Things, data analytics, and automatic reporting systems (Ghobakhloo, 2020). Global customers ' demands and supply chain traceability pressure require digital tracking tools, blockchain technologies, and transparency platforms to confirm the environmental impact. Third, AI and machine learning investments are driven by operational efficiency improvements: optimised energy consumption, waste reduction, and better resource allocation.

https://doi.org/10.24191/gading.v290i1.739

5.4 Social Expectations as Engagement Drivers

The significance of the social aspect to the digital transformation (b = 0.298, H 2 accepted) reflects the growing nature of the parties involved and the employees' expectations on the technology implementation (Freeman et al., 2020). Malaysian companies work within culturally diverse contexts and with diverse stakeholder needs and expectations that demand advanced digital communication and engagement. The social-digital relationship works in four directions. First of all, the employees must possess a contemporary workspace, such as the necessity to utilise collaboration tools and the requirement to have a flexible workplace, the necessity to have an array of other digital productivity sources that can lead to job satisfaction and productivity, as well as the primary reason why they invest in these areas (El-Kassar Singh, 2019). Second, the growing sophistication of customer and stakeholder relations implies that digital customer touchpoints, individual customer experiences, and active communication systems need to be developed to increase customer satisfaction and loyalty (Lemon & Verhoef, 2016). Simultaneously, the demands of the community and institutional stakeholders presuppose the fact that firms implement digital channels that would facilitate the transparent communication, the social impact reporting, and the inclusion in the decision-making processes (Eccles et al., 2014). Moreover, the digital collaboration and communication tools become more significant in diversity and inclusion efforts to provide equal access, multicultural involvement, and inclusive organisational culture (Nishii and Leroy, 2022). Surprisingly, relationships between service firms and digital transformation are stronger (b = 0.389) than between manufacturing firms and digital transformation (b = 0.245) because service industries rely more on human interactions and stakeholder relationships, which are better served with digital.

5.6 ESG-Digital Transformation Strategic Framework

The empirical evidence confirms a strategic model where ESG variables serve as the antecedents of digital transformation and not compliance impediments. In line with the stakeholder and resource-based theories, ESG pressures provoke companies to invest in digital capabilities that go beyond complying with regulations to competitive advantage creation (Hart and Dowell, 2011; Vial, 2019). In particular, compliance automation systems, which can subsequently transform into sophisticated business intelligence and predictive risk analytics systems, are driven by governance pressures.

The environmental pressures facilitate the digital innovation with the help of IoT-based monitoring, AI-assisted energy management, and digitally enabled supply chain traceability to provide sustainability and cost efficiencies. Social forces encourage the digital engagement platforms, which enhance the productivity of the employees, loyalty of the customer and trust of the community. These processes are directly manifested in the structural model of the study that determines governance, environmental, and social factors as important predictors of digital transformation.

5.7 Industry-Specific Strategic Implications

Sector manufacturing should focus on governance-based digital transformation with compliance automation, environmental monitoring, and quality management systems. Since the governance variables reveal the highest correlation with digital transformation in the combined sample (Table 6), and bearing in mind the high regulatory demands and compliance pressures that manufacturing companies are traditionally subjected to, the idea of governance-driven digital transformation may seem to be of specific importance to manufacturing-oriented settings. The digital projects aimed at automating the compliance, monitoring the environment, and managing the quality systems will thus most probably help to optimise the working process in the manufacturing plants. In contrast, environmental pressure can be used to achieve them.

Service sector needs to prioritise socially motivated digital change, focusing on customer engagement platforms, employee collaboration tools, and community interaction systems. There is also a strong positive relationship between social factors and digital transformation in the general model (Table 6). Since the service industry is sensitive to customer interaction, employee involvement, and relations with the community, socially-driven digital projects, including customer engagement services and employee

https://doi.org/10.24191/gading.v290i1.739

collaboration software, will probably be especially relevant in service-based companies. The strongest relationship of governance factors with the pooled structural model of digital transformation is presented (Table 6). Although the test of sectoral differences is not explicit in this study, the fact that the overall sample is dominated by governance drivers, together with the regulatory intensity that is usually typical of manufacturing-oriented sectors, implies that governance-based digital innovation, including compliance automation, environmental monitoring, and quality management systems, may be specifically applicable to the manufacturing-oriented background. Such implications are then not sector specific empirical conclusions but interpretative.

5.8 Emerging Market Context Insights

The findings in the case of Malaysia give empirical data on the importance of environmental, social, and governance (ESG) factors in the digital transformation of an emerging market environment. In particular, the pooled structural model yields evidences of strong positive relationships among the ESG dimensions and digital transformation (Table 6), which means that ESG-related pressures may be significant organisational facilitators of digital initiatives. These results imply that companies operating in the developing world can use digital investments to meet ESG needs to increase operational efficiency and responsiveness towards stakeholders at the same time. In the case of resource-constrained firms, this kind of alignment has the potential to change the ESG-related compliance from a cost-based necessity to a strategic value generator. Additionally, in an institutional context, where regulatory frameworks are subject to constant changes, an ESG-based and organisation-driven digitalisation can also be beneficial in organisational preparedness to the new regulatory alterations and integration into the global markets. Digital tools also provide new market companies with a way of connecting with international stakeholders, which to some degree affects geographic and resource limitations as it enhances access to knowledge networks, collaborations, and best practices**.**

6. LIMITATIONS, FUTURE RESEARCH DIRECTION AND CONTRIBUTIONS

6.1 Study-Specific Limitations

This study recognises several notable limitations that put results and findings into perspective and inform future research directions. To begin with, the cross-sectional design does not allow causal inference even when there are solid theoretical underpinnings and statistical correlations. The empirical evidence confirms a strategic model where ESG variables serve as the antecedents of digital transformation and not compliance impediments. In line with the stakeholder and resource-based theories, ESG pressures provoke companies to invest in digital capabilities that go beyond complying with regulations to competitive advantage creation (Hart and Dowell, 2011; Vial, 2019). In particular, compliance automation systems, which can subsequently transform into sophisticated business intelligence and predictive risk analytics systems, are driven by governance pressures. The environmental pressures facilitate the digital innovation with the help of IoT-based monitoring, AI-assisted energy management, and digitally enabled supply chain traceability to provide sustainability and cost efficiencies. Social forces encourage the digital engagement platforms, which enhance the productivity of the employees, loyalty of the customer and trust of the community. These processes are directly manifested in the structural model of the study that determines governance, environmental, and social factors as important predictors of digital transformation.

Second, we surveyed heavy machinery manufacturers, which were highly represented in our sample (45.6%), so generalisation to service-intensive economies or other industrial structures might be restricted. Although the distribution is representative of the economic profile of Malaysia, it might not be representative of other ASEAN economies with different sectoral compositions, like Singapore, which has a finance-based economy, and Thailand, which has a tourism-based economy. Our identified industry-specific differences imply that these compositional differences strongly impact ESG-digital transformation relationships.

https://doi.org/10.24191/gading.v290i1.739

Third, using self-reported measures creates the possibility of common method bias even with statistical controls. The single-factor test and the analysis of variance inflation factor by Harman suggest that the influence of bias is minor in most cases. However, validity would be improved when objective data on ESG pressures (data on regulatory enforcement, stakeholder grievances) and digital transformation results (data on IT investments, system implementations) are available. Such objective data is still not readily available because of confidentiality issues among Malaysian firms.

Fourth, researchers are not focusing on micro-enterprises with large and medium-sized shares of the Malaysian economy. Such smaller companies experience various resource limitations, pressure, and digital capabilities that can generate unique ESG-digital transformation relationships. Micro-enterprises could feel more severe constraints in resources, which impede ESG-oriented digital investments or, vice versa, could enjoy greater benefits when digital solutions can simultaneously satisfy a variety of ESG needs.

Fifth, researchers failed to consider the federal governance system in Malaysia and the cultural diversity that generates a heterogeneous institutional environment among states and territories. The regulatory environment that firms experience in Kuala Lumpur differs from that in Sabah or Sarawak, and multicultural backgrounds generate diverse expectations of stakeholders that could moderate ESG-digital transformation relationships. Such institutional differences are significant contextual considerations that influence how our findings can be generalised in Malaysia.

Sixth, measurement of ESG factors as drivers, as opposed to outcomes, may fail to capture proactive ESG practices by firms that look ahead instead of reacting to stakeholder pressures. Some Malaysian companies may undertake digital transformation as an instrument of strategic positioning, which will appeal to ESG-sensitive stakeholders in the reverse causal direction of what we propose.

6.2 Theoretical Limitations

Theoretically, researchers are confined to only two explanations, the stakeholder theory and the Resource-Based View, and we could be missing other contrasting explanations. The institutional theory views of coercive, mimetic, and normative pressures may further help understand how various ESG variables affect digital adoption differently (DiMaggio & Powell, 1983). Dynamic capabilities may better explain how companies acquire sensing, seizing, and reconfiguration capabilities in reaction to ESG pressures (Teece, 2007).

The simplification of empirical estimation of digital transformation through the homogenisation of digital transformation is likely to blur critical heterogeneity in technology categories. Previous studies reveal that various digital technologies are driven by various strategic pressure and produce differentiated results. As an illustration, the implementation of IoT, analytics, and energy-management systems to facilitate monitoring, efficiency, and emissions reduction are often related to environmental pressures (Ghobakhloo, 2020; Bieser and Hilty, 2018). The social pressures are likely to drive investments in digital work group solutions, customer interaction technologies, and people-focused technologies that increase communicating and inclusiveness (Lemon and Verhoef, 2016; Nishii and Leroy, 2022). The reasons related to governance instead are strongly associated with the implementation of compliance automation, digital reporting, and transparency systems (Eccles et al., 2014; DiMaggio and Powell, 1983).

6.3 Future Research Directions

Longitudinal research designs should be implemented in the future to focus on the effects of learning, its lagging performance effects, and the possible diminishing returns to create a digital transformation based on ESG (Brynjolfsson et al., 2021). By separating digital transformation into particular technologies, the researchers could determine that the environmental, social, and governance pressures are unequally driven to adoption of technology (Ghobakhloo, 2020). The cross-country research studies between the ASEAN economies might also clarify the extent to which the institutional environments mediate between ESG-digital relationships (North, 1990; Luo and Zhang, 2021).

https://doi.org/10.24191/gading.v290i1.739

6.4 Theoretical Contributions

The study builds upon stakeholder theory by showing how the various stakeholder groups generate unique pressures that drive the adoption of digital transformation. It demonstrates that the most significant impact on digital adoption is made by the governance stakeholders (regulators, investors, board members), the environmental stakeholders (regulators, communities, supply chain partners) impose considerable innovation pressures, and the social stakeholders (employees, customers, communities) can influence engagement-focused digital investments. This differentiated [stakeholder] practice moves theoretical knowledge beyond generic notions of stakeholder pressure.

The study contributes to the Resource-Based View theory by unveiling how ESG pressures drive firms to build digital capabilities that become valuable, rare, inimitable, and non-substitutable resources. The findings indicate that ESG-inspired digital transformation yields competitive advantages beyond compliance to produce operational efficiencies, customer value creation, and innovation capabilities that simultaneously impact many performance dimensions.

Most importantly, the study define ESG factors as important antecedents of digital transformation, filling the gaps in the current theoretical understanding about why firms are willing to undertake digital adoption beyond the traditional competitive and technological reasons. Within the study's framework, ESG pressures are not only strategic drivers but also generate strong business reasons to make digital investments, disputing the perception of ESG as cost centres and demonstrating their innovation-driving potential.

6.5 Practical Contributions

In the case of Malaysian companies, the findings are two-fold: they can be used as evidence-based advice on mobilising ESG requirements as the basis of overall digital transformation strategies. Instead of considering ESG compliance as two distinct cost centers, companies need to view these demands as opportunities to create digital capabilities that can produce numerous performance advantages. The digital transformation of manufacturing companies should be based on governance and aimed at automating compliance and environmental monitoring. The social factors based on digital adoption that should interest service firms are stakeholder engagement platforms and employee collaboration tools.

The findings allow Malaysian policymakers to develop interventions that can hasten compliance with ESG and digital transformation. Other initiatives include integrated ESG-digital incentive programs, regulatory frameworks to ensure the adoption of digital compliance solutions, and public-private partnerships that encourage cross-industry knowledge sharing. Such strategies bring out the best of policy by attaining two goals of sustainability and digitalisation through parallel actions.

International investors and development organisations can use the findings to develop better investment strategies in emerging markets. The ESG pressures of emerging economies offer attractive digital transformation investment opportunities that produce a social impact and returns. This two-fold profit model can be adopted per sustainable development objectives and generate desirable investment opportunities in fast-developing markets.

6.6 Original Input into the Emerging Markets Literature

The study explains the significant gaps in the literature that cover the emergent market digital transformation by determining the ESG factors as the key agents of technological uptake. The fact that we have recorded strong relationships indicates that emerging market firms can use rising ESG pressures to jump-start digital development that may lead to leapfrogging more traditional technology adoption trajectories. The implications of this finding for the policy and practice of sustainable development in the Global South are significant.

https://doi.org/10.24191/gading.v290i1.739

It was observed that performance advantages are higher than those found in studies of developed markets, indicating that emerging market environments could enhance the competitive benefits of digital transformation because there is more potential to improve conditions at the base. This observation justifies specific digital development policies in emerging economies built around ESG-compliant investments to make the most significant impact:

i. Digital ESG-Integration Strategic Framework - the evidence shows that in the context of the strategic framework, ESG factors generate business cases of digital transformation beyond compliance to create competitive advantages. This model contains three important elements:
   a. Governance-Led Digital Foundation - Companies must leverage the governance needs as a framework to complete digital change efforts. Compliance systems may become business intelligence platforms, risk management tools may become predictive analytics, and transparency systems may become customer engagement platforms.
   b. The Environmental Innovation Catalyst - Environmental tensions provide a channel where digital innovations can create sustainability and business value.
   c. Operations optimisation, lowering costs through AI-based energy management, and improving customer value propositions result from IoT monitoring systems, AI-based energy management, and digital supply chain traceability.
ii. Social Engagement Platform - Digital platform development is motivated by social stakeholder demands to improve relationships and capabilities. Employee systems increase productivity, customer platforms increase customer loyalty, and community tools increase reputation and a social license to operate.

7. CONCLUSION

This study examines the role of environmental, social, and governance factors in driving digital transformation and its association with firm performance in an emerging market context. According to the survey data of 574 Malaysian firms, it was found that ESG factors are major antecedents of digital transformation, and the governance factors had the greatest impact, then environmental and social factors. Moreover, digital transformation has a positive correlation with performance of the firms. These results indicate that the ESG pressures have a significant correlation with the choices of firms digital adoption and the following performance levels in the context of the constructs measured in this research.

With the ever-changing nature of the ESG expectations and digital capabilities, companies in emerging markets might be increasingly looking towards cohering the sustainability demands and digital actions. Although this paper presents cross-sectional data that indicates strong relations between ESG and digital in Malaysia, more research in the future is needed to address how the relations evolve over time and on institutional settings.

ACKNOWLEDGEMENTS/FUNDING

The authors would like to acknowledge the support of Institute of Postgraduate Studies (IPSR) Universiti Tunku Abdul Rahman (UTAR), Kampar, Perak, Malaysia and THB Faculty of Finance and Business of Universiti Tunku Abdul Rahman, Kampar, Perak, Malaysia for providing the facilities and financial support on this research.

CONFLICT OF INTEREST STATEMENT

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and declare the absence of conflicting interests with the funders.

AUTHORS' CONTRIBUTIONS

Huzaifa Ahmad conducted the study as a research project in his Master of Philosophy. His roles included the study conceptualisation, literature review, research design, data collection, data analysis, result

interpretation and the writing and rewriting of the manuscript. The general supervision and guidance in the research process was done by Au Yong Hui Nee. She was involved in the conceptual improvement of the study, sharpening of the theoretical and analytical framework, research design, and research rigor. She has been very critical in reviewing the manuscript, contributing a lot of intellectual contribution, and gave the final copy of the manuscript to be submitted. Abdelhak Senadjki assisted with the research design and methodology, offered expert advice and advice on empirical analysis and revision of results and gave critical feedback to enhance the quality and coherence of the manuscript. Another aspect is that he went through and signed the final manuscript before submission. Final manuscript is read and approved by all authors who are also agreeable to being responsible of every bit of the work.

REFERENCES

Aguilera, R. V., Desender, K. A., López-Puertas-Lamy, M., & Lee, J. H. (2021). Corporate governance and digital transformation: Toward a new research agenda. *Academy of Management Perspectives, 35*(4), 579–603. https://dx.doi.org/10.2139/ssrn.4851556

Aguilera, R. V., Rupp, D. E., Williams, C. A., & Ganapathi, J. (2007). Putting the S back in corporate social responsibility: A multilevel theory of social change in organizations. *Academy of Management Review, 32*(3), 836–863. https://doi.org/10.5465/amr.2007.25275678

Aguilera, R. V., Williams, C. A., Conley, J. M., & Rupp, D. E. (2007). Corporate governance and social responsibility: A comparative analysis of the UK and the US. Corporate Governance: An International Review, 14(3), 147-158. https://doi.org/10.1111/j.1467-8683.2006.00495.x

Al Mamun, M. A., Islam, H., Karim, R., Siddieq, M. M., & Rana, M. (2025). Exploring the role of blockchain technology in promoting sustainability in the banking sector: An empirical analysis using structural equation modeling. AI & Society, 40(1), 1–18. https://doi.org/10.1007/s00146-025-02250-9

Almustafa, H., Nguyen, Q. K., Liu, J., & Dang, V. C. (2023). The impact of COVID-19 on firm risk and performance in MENA countries: Does national governance quality matter? *PLoS ONE, 18*(2). https://doi.org/10.1371/journal.pone.0281148

Anas, M., Gulzar, I., Tabash, M. I., Ahmad, G., Yazdani, W., & Alam, M. F. (2023). Investigating the nexus between corporate governance and firm performance in India: Evidence from COVID-19. *Journal of Risk and Financial Management, 16*(7). https://doi.org/10.3390/jrfm16070307

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, 120420. https://doi.org/10.1016/j.techfore.2020.120420

Bajčić, D., & Guzijan, J. (2021). Digital Transformation of Marketing Strategies during a Pandemic: Life Insurance Firms' Customer Satisfaction and Purchase Intention. *Sustainability, 13*(12), Article 6735. https://doi.org/10.3390/su13126735

Bank Negara Malaysia. (2023). Financial stability report 2023: Digital transformation and sustainable finance integration. Bank Negara Malaysia Press.

Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99–120. https://doi.org/10.1177/014920639101700108

Barney, J. B., & Arikan, A. M. (2001). The resource-based view: Origins and implications for organizational science. Organization Science, 12(3), 342-357. http://dx.doi.org/10.1111/b.9780631218616.2006.00006.x

Bartik, A. W., Bertrand, M., Cullen, Z., Glaeser, E. L., Luca, M., & Stanton, C. T. (2020). The impact of COVID-19 on small business outcomes and expectations. *Proceedings of the National Academy of Sciences, 117*(30), 17656–17666. https://doi.org/10.1073/pnas.2006991117

Barua, A., Kriebel, C. H., & Mukhopadhyay, T. (2004). Information technologies and business value: An analytic and empirical investigation. *Information Systems Research*, *6*(1), 3–23.

Bieser, J. C. T., & Hilty, L. M. (2018). Assessing indirect environmental effects of information and communication technology (ICT): A systematic literature review. *Sustainability*, *10*(8), 2662. https://doi.org/10.3390/su10082662

Boulouta, I., & Pitelis, C. N. (2014). Who needs CSR? The impact of corporate social responsibility on national competitiveness. *Journal of Business Ethics*, *119*(3), 349–364. https://doi.org/10.1007/s10551-013-1633-2

Bouwman, H., Nikou, S., & De Reuver, M. (2018). Digitalization, business models, and SMEs: How do business model innovation practices improve the performance of digitalizing SMEs? *Telecommunications Policy*, *43*(9), 101848.

Brynjolfsson, Erik, Daniel Rock, and Chad Syverson. 2021. "The Productivity J-Curve: How Intangibles Complement General Purpose Technologies." *American Economic Journal: Macroeconomics* 13 (1): 333–72**.**DOI: 10.1257/mac.20180386

Bursa Malaysia. (2023). *Sustainability reporting guide (3rd ed.)*. Bursa Malaysia Berhad.

Carroll, A. B., & Shabana, K. M. (2010). The business case for corporate social responsibility: A review of concepts, research and practice. International Journal of Management Reviews, 12(1), 85-105. https://doi.org/10.1111/j.1468-2370.2009.00275.x

Christensen, H. B., Hail, L., & Leuz, C. (2021). Mandatory CSR and sustainability reporting: Economic analysis and literature review. *Review of Accounting Studies*, *26*, 1176–1248. https://doi.org/10.1007/s11142-021-09609-5

Cupertino, S., & Vitale, G. (2024). Exploring the nexus between corporate digitalisation and environmental sustainability: The moderating role of slack resources. *Management Control http://dx.doi.org/10.3280/MACO2024-001005*

Dawes, J. (2008). Do data characteristics change according to the number of scale points used? *International Journal of Market Research*, *50*(1), 61–77. https://doi.org/10.1177/147078530805000106

Delmas, M. A., & Toffel, M. W. (2008). Organizational responses to environmental demands. *Strategic Management Journal, 29*(10), 1027–1055. https://doi.org/10.1002/smj.701

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). Wiley.

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. American Sociological Review, 48(2), 147-160. https://doi.org/10.2307/2095101

Dubey R, Gunasekaran A, Childe SJ (2019), "Big data analytics capability in supply chain agility: The moderating effect of organizational flexibility". *Management Decision*, Vol. 57 No. 8 pp. 2092–2112, doi: https://doi.org/10.1108/MD-01-2018-0119

Dwivedi, Y. K., et al. (2021). Artificial intelligence (AI): Multidisciplinary perspectives on emerging challenges. *International Journal of Information Management*, *57*, 101994. https://doi.org/10.1016/j.ijinfomgt.2019.08.002

Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. Management Science, 60(11), 2835-2857. https://doi.org/10.1287/mnsc.2014.1984

El-Kassar, A. N., & Singh, S. K. (2019). Green innovation and organizational performance: The influence of big data and the moderating role of management commitment and HR practices. Technological Forecasting and Social Change, 144, 483-498. https://doi.org/10.1016/j.techfore.2017.12.016

Elkington, J. (1997). *Cannibals with forks: The triple bottom line of 21st-century business*. Capstone.

Etikan, I., & Bala, K. (2017). Sampling and sampling methods. Biometrics & Biostatistics International Journal, 5(6), 215–217. https://doi.org/10.15406/bbij.2017.05.00149

Evans, J. R., & Mathur, A. (2018). The value of online surveys. *Internet Research, 28*(4), 854–887. https://doi.org/10.1108/IntR-03-2017-0083

Financial Times. (2024, May 21). Link between wellbeing and productivity is made 'clear'. *Financial Times.* https://www.ft.com/content/0c12fc4d-4aa5-43ec-a68d-dbbee08f8762

Franke, G., & Sarstedt, M. (2019). Heuristics versus statistics in discriminant validity testing: A comparison of four procedures. *Internet Research, 29*(3), 430–447. https://doi.org/10.1108/IntR-12-2017-0515

Freeman, R. E. (1984). Strategic management: A stakeholder approach. Pitman Publishing.

Freeman, R. E., Phillips, R., & Sisodia, R. (2020). Tensions in stakeholder theory. Business & Society, 59(2), 213-231. https://doi.org/10.1177/0007650318796792

Fu, T., & Li, J. (2023). An empirical analysis of the impact of ESG on financial performance: The moderating role of digital transformation. Frontiers in Environmental Science, 11, 1256052. https://doi.org/10.3389/fenvs.2023.1256052

George, G., Merrill, R. K., & Schillebeeckx, S. J. D. (2020). Digital Sustainability and Entrepreneurship: How Digital Innovations Are Helping Tackle Climate Change and Sustainable Development. *Entrepreneurship Theory and Practice*, *45*(5), 999-1027. https://doi.org/10.1177/1042258719899425

Ghobakhloo, M. (2020). Industry 4.0, digitization, and opportunities for sustainability. *Journal of Cleaner Production, 252*, 119869. https://doi.org/10.1016/j.jclepro.2019.119869

Grima, S., Maditinos, D., Noja, G. G., & Stankevičienė, J. (2024). Exploring ESG challenges and opportunities: Navigating towards a better future. *Emerald Insight.* https://doi.org/10.1108/S1569-375920240000116017

Guan, D., Wang, D., Hallegatte, S., Davis, S. J., Huo, J., Li, S., ... & Gong, P. (2020). Global supply-chain effects of COVID-19 control measures. *Nature Human Behaviour*, 4(6), 577–587. https://doi.org/10.1038/s41562-020-0896-8

Guan, J., Kirikkaleli, D., Bibi, A., & Zhang, W. (2020). Natural resources rents nexus with financial development. *Resources Policy*, *66*, 101641. https://doi.org/10.1016/j.resourpol.2020.101641

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2019). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2nd ed.). Sage.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(2), 2-24. https://doi.org/10.1108/EBR-11-2018-0203

Hart, S. L. (1995). A natural-resource-based view of the firm. *Academy of Management Review, 20*(4), 986–1014. https://doi.org/10.5465/amr.1995.9512280033

Hart, S. L., & Dowell, G. (2011). A natural-resource-based view of the firm. *Journal of Management, 37*(5), 1464–1479. https://doi.org/10.1177/0149206310390219

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(1), 115-135. https://doi.org/10.1007/s11747-014-0403-8

Hrouga, M., Sbihi, A., & Chavallard, M. (2022). The potentials of combining Blockchain technology and Internet of Things for digital reverse supply chain: A case study. Journal of Cleaner Production, 337, 130563. https://doi.org/10.1016/j.jclepro.2022.130609

Hurley, S. (2025). *Bridging compliance and intelligence: Integrating AI in PCI DSS v4.0 security frameworks.* ResearchGate. https://www.researchgate.net/publication/394738036

Huse, M. (2007). Boards, governance and value creation: The human side of corporate governance. Cambridge University Press.

Ivanov, D. (2022). Viable supply chain model: Integrating agility, resilience and sustainability perspectives—lessons from and thinking beyond the COVID-19 pandemic. Annals of Operations Research, 322, 1995–2016. https://doi.org/10.1007/s10479-020-03640-6

Jamali, D., Karam, C., Yin, J., & Soundararajan, V. (2017). CSR logics in developing countries: Translation, adaptation and stalled development. *Journal of World Business, 52*(3), 343–359. https://doi.org/10.1016/j.jwb.2017.02.001

Jardak, M. K., & Ben Hamad, S. (2022). The effect of digital transformation on firm performance: Evidence from Swedish listed companies. *The Journal of Risk Finance, 23*(4), 329–348. https://doi.org/10.1108/JRF-12-2021-0199

Kaplan, R. S., & Norton, D. P. (1996). Using the balanced scorecard as a strategic management system. Harvard Business Review, 74(1), 75-85.

Kashyap, S., & Rastogi, S. (2025). The ESG imperative: Transforming risk management in the age of sustainable finance in the Indian banking industry. NMIMS Management Review. https://doi.org/10.1177/09711023251356167

Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., & Roig-Tierno, N. (2021). Digital Transformation: An Overview of the Current State of the Art of Research. *Sage Open, 11*(3). https://doi.org/10.1177/21582440211047576

Kristoffersen, E., Blomsma, F., Mikalef, P., & Li, J. (2020). The smart circular economy: A digital-enabled circular strategies framework for manufacturing companies. Journal of Business Research, 120, 241-261. https://doi.org/10.1016/j.jbusres.2020.07.044

Krueger, P., Sautner, Z., & Starks, L. T. (2021). The importance of climate risks for institutional investors. *Review of Financial Studies, 34*(3), 1067–1111. https://dx.doi.org/10.2139/ssrn.3235190

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (2000). Investor protection and corporate governance. Journal of Financial Economics, 58(1-2), 3-27. https://doi.org/10.1016/S0304-405X(00)00065-9

Le Quéré, C., Jackson, R. B., Jones, M. W., Smith, A. J. P., Abernethy, S., Andrew, R. M., De-Gol, A. J., Willis, D. R., Shan, Y., Canadell, J. G., Friedlingstein, P., Creutzig, F., & Peters, G. P. (2020). Temporary reduction in daily global CO_2 emissions during the COVID-19 forced confinement. *Nature Climate Change, 10*(7), 647–653. https://doi.org/10.1038/s41558-020-0797-x

Liu, X., & Wang, L. (2025). Digital transformation, ESG performance, and enterprise innovation. Scientific Reports, 15, 1234. https://doi.org/10.1038/s41598-025-08850-1

López-Iturriaga, F. J., & Morrós Rodríguez, I. (2014). Boards of directors and firm performance: The effect of multiple directorships. *Spanish Journal of Finance and Accounting*, 43(2), 177–192. https://doi.org/10.1080/02102412.2014.913909

Malaysian Digital Economy Corporation. (2023). Malaysia digital economy blueprint 2023-2030: ESG-driven digital transformation. MDEC Publications.

Marczewska, M. (2025). Digital transformation, ESG, and companies' performance. The Journal of Technology Transfer, 50(1), 1-25. https://doi.org/10.1007/s10961-025-10247-1

McKendrick, J. (2021, September 29). Digital Raises Revenues, But Unevenly, Study Says. *Forbes*. https://www.forbes.com/sites/joemckendrick/2021/09/29/digital-raises-revenues-but-unevenly-study-says/

Melville, N. P. (2010). Information systems innovation for environmental sustainability. *MIS Quarterly*, *34*(1), 1–21.

Mirza, S. S., Corbet, S., & Scrimgeour, F. (2024). Responsible or 'controlled' digitalisation? ESG performance and corruption in China. *SSRN Electronic Journal.*

Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. Academy of Management Review, 22(4), 853-886. https://doi.org/10.5465/amr.1997.9711022105

Mutambik, I. (2024). Digital transformation as a driver of sustainability performance—A freight and logistics industry study. *Sustainability*, *16*(10). https://doi.org/10.3390/su16104310

Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. Research Policy, 48(8), 103773. https://doi.org/10.1016/j.respol.2019.03.018

North, D. C. (1990). *Institutions, institutional change and economic performance.* Cambridge University Press.

Luo, Y., & Tung, R. L. (2018). A general theory of springboard multinational enterprises. *Journal of International Business Studies*, *49*(2), 129–152. https://doi.org/10.1057/s41267-017-0114-8

OECD. (2020). *Digital transformation in ASEAN*. OECD Publishing.

Olsson, V., & Zhi, X. (2024). The impact of digitalisation on sustainability performance: A study on manufacturing firms in Northern Europe. *DiVA Portal. https://www.gbmrjournal.com/pdf/v16n4/V16N4-13.pdf*

Ooi, K. B., Lee, V. H., Tan, G. W. H., Hew, T. S., & Hew, J. J. (2018). Cloud computing in manufacturing: The next industrial revolution in Malaysia? *Expert Systems with Applications, 93*, 376–394. https://doi.org/10.1016/j.eswa.2017.10.009

Parmentola, A., Petrillo, A., Tutore, I., & Cirillo, F. (2022). Is blockchain able to enhance environmental sustainability? A systematic review and research agenda from the perspective of Sustainable Development Goals (SDGs). Business Strategy and the Environment, 31(1), 194-217. https://doi.org/10.1002/bse.2882

Peteraf, M. A. (1993). The cornerstones of competitive advantage. *Strategic Management Journal, 14*(3), 179–191. https://doi.org/10.1002/smj.4250140303

Pizzi, S., Caputo, A., Corvino, A., & Venturelli, A. (2020). Management research and the UN sustainable development goals (SDGs): A bibliometric investigation and systematic review. *Journal of Cleaner Production, 276*, 124033. https://doi.org/10.1016/j.jclepro.2020.124033

Porter, M. E., & Kramer, M. R. (2011). Creating shared value. *Harvard Business Review*, *89*(1–2), 62–77.

Porter, M. E., & Kramer, M. R. (2019). Creating shared value. In Managing sustainable business (pp. 323-346). Springer.

Porter, M. E., & van der Linde, C. (1995). Toward a new conception of the environment-competitiveness relationship. Journal of Economic Perspectives, 9(4), 97-118. https://doi.org/10.1257/jep.9.4.97

Queiroz, M. M., Ivanov, D., Dolgui, A., & Fosso Wamba, S. (2020). Impacts of epidemic outbreaks on supply chains: Mapping a research agenda amid the COVID-19 pandemic through a structured literature review. Annals of Operations Research, 298(1), 989–1006. https://doi.org/10.1007/s10479-020-03685-7

Regmi, P. R., Waithaka, E., Paudyal, A., Simkhada, P., & van Teijlingen, E. (2016). Guide to the design and application of online questionnaire surveys. *Nepal journal of epidemiology*, *6*(4), 640–644. https://doi.org/10.3126/nje.v6i4.17258

Sachs, J. D., et al. (2019). Six transformations to achieve the SDGs. *Nature Sustainability, 2*, 805–814. https://doi.org/10.1038/s41893-019-0352-9

Salam, M. T., Imtiaz, H., & Burhan, M. (2021). The perceptions of SME retailers towards the usage of social media marketing amid COVID-19 crisis. Journal of Entrepreneurship in Emerging Economies, 13(4), 878–897. https://doi.org/10.1108/JEEE-07-2020-0274

Sarkis, J., Cohen, M. J., Dewick, P., & Schröder, P. (2020). A brave new world: Lessons from the COVID-19 pandemic for transitioning to sustainable supply and production. *Resources, Conservation and Recycling, 159*. https://doi.org/10.1016/j.resconrec.2020.104894

Sarstedt, M., Hair, J. F., Cheah, J. H., Becker, J. M., & Ringle, C. M. (2020). How to specify, estimate, and validate higher-order constructs in PLS-SEM. Australasian Marketing Journal, 27(3), 197-211. https://doi.org/10.1016/j.ausmj.2019.05.003

Schulz, K. A., Gstrein, O. J., & Zwitter, A. J. (2020). Exploring the governance and implementation of sustainable development initiatives through blockchain technology. Futures, 122, 102611. https://doi.org/10.1016/j.futures.2020.102611

Scott, W. R. (2014). *Institutions and organizations* (4th ed.). Sage.

Securities Commission Malaysia. (2022). *Malaysian code on corporate governance*.

Securities Commission Malaysia. (2022). Sustainable and responsible investment roadmap for the Malaysian capital market: ESG integration and digital innovation. Securities Commission Malaysia.

Shah, A., Soomro, M. A., Piprani, A. Z., Yu, Z., Rafique, W., & Hussain, S. (2023). Sustainable supply chain practices and blockchain technology in garment industry: An empirical study on sustainability aspect. Journal of Strategy and Management, 16(4), 652-678. https://doi.org/10.1108/JSMA-04-2023-0080

Sharma, A., Adhikary, A., & Borah, S. B. (2020). COVID-19's impact on supply chain decisions: Strategic insights from NASDAQ 100 firms using Twitter data. Journal of Business Research, 117, 443–449. https://doi.org/10.1016/j.jbusres.2020.05.035

Shiau, W. L., Sarstedt, M., & Hair, J. F. (2019). Internet research using partial least squares structural equation modeling (PLS-SEM). Internet Research, 29(3), 398-406. https://doi.org/10.1108/INTR-10-2018-0447

Simmie, J., & Martin, R. (2010). The economic resilience of regions: Towards an evolutionary approach. Cambridge Journal of Regions, Economy and Society, 3(1), 27–43. https://doi.org/10.1093/cjres/rsp029

Sobotkiewicz, D., & Waniowski, P. (2022). Changes in relationships with business customers under the influence of the pandemic: The example of a medium-sized enterprise in the paper industry. *European Research Studies Journal, 25*(2), 376–386.

Tabachnick, B. G., & Fidell, L. S. (2019). *Using multivariate statistics* (7th ed.). Pearson.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. Strategic Management Journal, 28(13), 1319-1350. https://doi.org/10.1002/smj.640

Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning*, *51*(1), 40–49. https://doi.org/10.1016/j.lrp.2017.06.007

Teece, D. J. (2018). Profiting from innovation in the digital economy: Enabling technologies, standards, and licensing models in the wireless world. Research Policy, 47(8), 1367-1387. https://doi.org/10.1016/j.respol.2017.01.015

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. Strategic Management Journal, 18(7), 509-533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7%3C509::AID-SMJ882%3E3.0.CO;2-Z

Tirole, J. (2001). Corporate governance. *Econometrica*, *69*(1), 1–35.

Utami, M. R., & Afif, N. (2025). The impact of ESG performance on firm value: A study of high and low profile industries in Southeast Asia. Journal of Economics, Business, and Government Challenges, 8(1), 112–130. https://ebgc.upnjatim.ac.id/index.php/ebgc/article/view/1523

Valaskova, K., Nagy, M., & Juracka, D. (2025). Digital transformation and financial performance: An empirical analysis of strategic alignment in the digital age. Journal of Economics and Finance, 49(2), 234-251. https://doi.org/10.1108/jec-11-2024-0241

Van Alstyne, M. W., & Parker, G. G. (2021, December 17). Digital Transformation Changes How Companies Create Value. *Harvard Business Review*. https://hbr.org/2021/12/digital-transformation-changes-how-companies-create-value

Velte, P. (2020). Does ESG performance have an impact on financial performance? Evidence from Germany. *Journal of Global Responsibility*, *11*(1), 49–69.

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. Journal of Business Research, 122, 889-901. https://doi.org/10.1016/j.jbusres.2019.09.022

Verma, S., & Gustafsson, A. (2020). Investigating the emerging COVID-19 research trends in the field of business and management: A bibliometric analysis approach. *Journal of Business Research, 118*, 253–261. https://doi.org/10.1016/j.jbusres.2020.06.057

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. The Journal of Strategic Information Systems, 28(2), 118-144. https://doi.org/10.1016/j.jsis.2019.01.003

Voorhees, C. M., Brady, M. K., Calantone, R., & Ramirez, E. (2016). Discriminant validity testing in marketing: An analysis, causes for concern, and proposed remedies. *Journal of the Academy of Marketing Science*, *44*(1), 119–134. https://doi.org/10.1007/s11747-015-0455-4

Wang, F., Jia, Y., Li, G., Lam, M., & Liu, Y. (2024). An empirical study of the relationship between digital transformation, corporate social responsibility and financial performance. Business Ethics and Leadership, 8(1), 57-73. https://doi.org/10.61093/bel.8(1).57-73.2024

Warner, K. S. R., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. Long Range Planning, 52(3), 326-349. https://doi.org/10.1016/j.lrp.2018.12.001

World Bank. (2022). *Malaysia digital economy diagnostic*. World Bank Publications.

Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of Marketing*, *80*(6), 69–96. https://doi.org/10.1509/jm.15.0420

Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. *Management Science, 60*(11), 2835–2857. https://doi.org/10.1287/mnsc.2014.1984

Nishii, L. H., & Leroy, H. (2022). A multilevel framework of inclusive leadership. *Academy of Management Annals, 16*(1), 264–310. https://doi.org/10.5465/annals.2020.0190

Xu, J., Liu, F., & Shang, Y. (2025). Digital transformation and ESG performance: The chain mediating effect of green innovation and stakeholder engagement. Technological Forecasting and Social Change, 202, 123294. https://doi.org/10.1016/j.frl.2024.106387

Zhang, S. (2022). *Does digital transformation enhance a firm's performance? Evidence from China.* Technology in Society, 68, 101841**.** https://doi.org/10.1016/j.techsoc.2021.101841

Zhao, X., Chen, Q., Zhang, H., Chen, P., & Chen, S. (2024). A study on the influencing factors of corporate digital transformation: Empirical evidence from Chinese listed companies. Scientific Reports, 14, 8142. https://doi.org/10.1038/s41598-024-56729-4

Zheng, X., Yu, H., & Luo, J. (2024). Enterprise ESG performance, digital transformation, and innovation performance: Evidence from China. SAGE Open, 14(4), 21582440241291680. https://doi.org/10.1177/21582440241291680

About the Authors

Huzaifa Ahmad is a Master of Philosophy (MPhil) researcher in Economics in the Teh Hong Piow Faculty of Business Finance, Universiti Tunku Abdul Rahman (UTAR), Malaysia. He is interested in his research in digital transformation, environmental, social and governance (ESG), sustainability, and performance of firms in emerging economies. He possesses background knowledge in the quantitative research techniques, empirical analysis, and publication in the academic journals and presented his research in the international conferences. He can be contacted via email at huzaifa8858@gmail.com.

Au Yong Hui Nee. PhD is a Professor of Business and Finance in the Teh Hong Piow Faculty of Business and Finance, Universiti Tunku Abdul Rahman (UTAR), Malaysia. Her professional interests are in digital circular economy, ESG, sustainable development goals (SDGs), and occupational safety and health. She is a well-experienced postgraduate supervisor and has a large publication history in sustainability, development economics and applied economic research. She can be reached at auyonghn@utar.edu.my.

Abdelhak Senadjki, PhD is a Professor in the Teh Hong Piow Faculty of Business and Finance at Universiti Tunku Abdul Rahman (UTAR), in Malaysia. His areas of research are development economics, energy economics, health economics, green human resource management, social protection, poverty research, and technology-based innovation. He has overseen postgraduate studies, and has assisted in the empirical research on the topic of sustainability and socio-economic progress. He can be contacted at abdelhak@utar.edu.my.