International Journal of Accounting & Finance in Asia Pasific (IJAFAP)
Vol. 8 No. 2, pp.239-256, June, 2025
E-ISSN: 2621-2862 P-ISSN: 2614-7432
https://www.ejournal.aibpmjournals.com/index.php/IJAFAP

A Conceptual Framework for Synergizing Marketing and Environmental Innovations to Enhance Sustainable Business Performance in Malaysia's Technology Sector

Chu-Hui Ng[1], Jeffrey S. S. Cheah[1*]
[1]Universiti Sains Malaysia, Jalan Sg Dua, 11800 Minden, Pulau Pinang, Malaysia
*Corresponding Email: sausengcheah@gmail.com

ARTICLE INFORMATION

Publication information

Research article

HOW TO CITE
Ng, C-H., & Cheah, J. S. S. (2025). A Conceptual framework for synergizing marketing and environmental innovations to enhance sustainable business performance in Malaysia's technology sector. *International Journal of Accounting & Finance in Asia Pasific*, *8*(2), 239-256.

DOI:
https://doi.org/10.32535/ijafap.v8i2.3928

Copyright @ 2025 owned by Author(s). Published by IJAFAP

This is an open-access article.
License:
Attribution-Noncommercial-Share Alike (CC BY-NC-SA)

Received: 18 April 2025
Accepted: 19 May 2025
Published: 20 June 2025

ABSTRACT

Sustainable business performance (SBP) has emerged as a critical concern in light of escalating environmental degradation and resource depletion, especially in developing economies. This conceptual study explores how the synergy between marketing innovation (MI) and environmental innovation (EI) can enhance SBP in Malaysia's technology sector. Anchored in the Resource-Based View (RBV), the objective is to develop an integrated framework that positions these innovations as strategic organizational resources contributing to economic, environmental, and social performance. A systematic literature review (SLR) was conducted using peer-reviewed articles from 2015 to 2020, resulting in the selection of seven core studies from six high-impact journals. The analysis revealed a consistent emphasis on eco-innovation and a notable gap in MI in sustainability. The proposed framework highlights the complementary effects of marketing and EI in fostering competitive advantage and long-term value creation. This study offers theoretical contributions to innovation-sustainability discourse and practical implications for managers and policymakers striving to embed sustainability into organizational strategies. Future empirical research is encouraged to validate the framework and investigate the interaction of contextual variables such as market turbulence and organizational agility.

Keywords: Environmental Innovation; Marketing Innovation; Resource-Based View; Sustainable Business Performance; Technology Sector

International Journal of Accounting & Finance in Asia Pasific (IJAFAP)
Vol. 8 No. 2, pp.239-256, June, 2025
E-ISSN: 2621-2862 P-ISSN: 2614-7432
https://www.ejournal.aibpmjournals.com/index.php/IJAFAP

INTRODUCTION

The world faces critical and interconnected challenges stemming from accelerating ecosystem degradation, resource depletion, and escalating carbon emissions—consequences of unsustainable industrial development and excessive consumption patterns. These environmental threats are compounded by insufficient investment in ecological preservation, particularly in developing and emerging economies. Sustainable development entails "meeting the needs of the present without compromising the ability of future generations to meet their own needs." This guiding principle has shaped global sustainability discourse and has driven emphasis on achieving low emissions, enhancing energy efficiency, and promoting circular resource use, such as material recycling (Zhang et al., 2020).

At the corporate level, sustainable development cannot be realized without the active adoption of innovative environmental practices that embed sustainability into core operations. Green technologies, cleaner production, and proactive stakeholder engagement are now imperative, not optional. Yet, achieving this transition requires businesses to rethink how innovation—not only technological but also organizational and marketing—can contribute to holistic sustainability objectives.

Asia's economic rise—driven by countries such as China, India, and members of the ASEAN bloc—has delivered impressive GDP growth and poverty alleviation. However, this progress has often come at a significant environmental cost. Intensified urbanization, industrial sprawl, deforestation, and pollution have become common side effects of growth (Liao, 2018b). Energy overconsumption, desertification, and biodiversity loss are threatening both ecological balance and public health. In response, a paradigm shift toward sustainable business practices is taking shape, driven by heightened public expectations, investor pressure, regulatory frameworks, and broader societal values (Cheah, Amran et al., 2023).

Focusing on Southeast Asia, the region's transition to sustainability remains uneven. Countries in this region are facing increasing difficulty in achieving the United Nations Sustainable Development Goals (SDGs) by the 2030 deadline. Critical challenges persist, including rising inequality, fragile healthcare systems, limited social protection coverage, and extensive ecosystem deterioration (Amran et al., 2023; Cheah, Loh et al., 2023). These structural vulnerabilities were further exposed during the COVID-19 pandemic. Post-pandemic recovery efforts have reinforced the need to bridge digital divides, enhance green economic recovery, reduce emissions, and strengthen institutional governance and human rights (Chiew & Cheah, 2025; Quyen et al., 2024; Rajah et al., 2022).

Malaysia presents a microcosm of these sustainability dilemmas. The 2018 Initial Assessment of SDG Indicators identified key progress in selected domains but also flagged major gaps in water management, responsible consumption, urban sustainability, and social equity, many of which scored below 40% in achievement levels (Shukor, 2018). These findings underscore the limited awareness and capability among Malaysian firms and communities to address sustainability challenges holistically. While progressive companies have begun integrating ESG factors and sustainability disclosures, many organizations still lack coherent frameworks or internal capacity to respond meaningfully (Ch'ng et al., 2020; Cheah et al., 2024).

The Triple Bottom Line (TBL) concept remains central to understanding sustainable business performance (SBP). It requires organizations to simultaneously address economic viability, environmental stewardship, and social responsibility. However,

traditional business models and performance metrics continue to prioritize economic gains over sustainability objectives. This disconnect impedes systemic change and highlights the need for integrative models that embed sustainability into strategic decision-making and innovation management.

This conceptual study narrows its focus to Malaysia's technology sector, which stands at the intersection of digital innovation, industrial productivity, and environmental risk. The study aims to conceptualize how marketing and environmental innovations (EIs)—two underexplored but vital forms of non-technological innovation—can work synergistically to elevate SBP. SBP, in this context, is measured across economic, environmental, and social dimensions.

Drawing on the Resource-Based View (RBV), this research positions marketing and EIs as unique, valuable, and inimitable firm resources. These resources enable the development of sustained competitive advantages that are aligned with long-term sustainability goals (Barney, 1991; Geng et al., 2021). Prior studies have traditionally emphasized technological and product innovation, but less attention has been paid to the strategic interaction between marketing innovation (MI) and EI, particularly how these interact in technology-intensive firms facing environmental volatility and market pressure.

The increasing complexity of sustainability imperatives—exacerbated by the disruptions of the COVID-19 pandemic and the looming threat of climate shocks—underscores the urgent need for integrative innovation strategies that can enhance organizational resilience and long-term value creation (Teoh & Cheah, 2025). In response to this challenge, the present paper addresses a critical research gap by proposing a conceptual framework that aligns MI and EI within the theoretical lens of the RBV. By examining how firms can strategically leverage these innovation types as intangible resources, the study seeks to build a more cohesive understanding of their contribution to SBP.

The primary objective of this work is to develop a theoretical framework that elucidates the link between marketing and EIs and their collective impact on sustainable business outcomes. This involves clarifying how these forms of innovation function as strategic organizational capabilities that enhance adaptability, responsiveness, and competitive advantage. In doing so, the paper also aims to generate actionable insights for business leaders and policymakers—particularly in the context of emerging economies such as Malaysia—where technological adoption and sustainability transitions are rapidly evolving. Through this approach, the study offers a fresh perspective on the synergy between different innovation dimensions and contributes both theoretically and practically to advancing sustainability in technology-intensive sectors.

LITERATURE REVIEW

The Importance of Sustainable Business Performance (SBP)

The survival rate of new businesses, particularly in innovation-driven and resource-intensive industries, remains alarmingly low. This is compounded by increasing pressure on firms to address climate change risks and align with sustainability mandates. Despite the presence of policy instruments intended to encourage sustainable transitions—such as tax incentives, carbon pricing, or green financing—their effectiveness has often been constrained by weak enforcement mechanisms, limited adoption, and lack of strategic integration into core business models (Tsalis & Nikolaou, 2017). These conditions reinforce the relevance of SBP as a multidimensional construct encompassing not just profitability, but also environmental stewardship and social responsibility. It reflects a

firm's capacity to deliver consistent value creation through efficient, ethical, and environmentally friendly operations (Cheah et al., 2024; Fernando et al., 2019).

Theoretical Foundations of Sustainability in Business

One of the foundational perspectives supporting SBP is Michael Porter's Creating Shared Value (CSV) model. Unlike conventional approaches that treat social responsibility as external to the firm's commercial goals, the CSV framework views societal challenges—such as climate change, inequality, and public health—as opportunities for innovation and growth. By investing in energy efficiency, clean technologies, green marketing, and workplace safety, firms not only meet regulatory or reputational expectations but also create competitive differentiation and long-term value (Porter & Kramer, 2018). This virtuous cycle, wherein solving societal issues enhances business competitiveness, illustrates a more proactive and inclusive vision of capitalism and is increasingly aligned with how modern firms are being evaluated by ESG-focused stakeholders (Cheah, Amran et al., 2023).

The TBL framework further expands this logic by demanding simultaneous performance across three pillars: profit (economic), planet (environmental), and people (social). It serves as an operational guideline for embedding sustainability into business practices and performance assessment. However, the empirical application of TBL remains inconsistent. Many businesses still prioritize short-term economic returns, treating environmental and social concerns as peripheral. In Malaysia, for example, the Initial Assessment of SDG Indicators revealed that despite measurable gains in education and infrastructure, key sustainability indicators such as climate resilience, responsible consumption, and urban sustainability remain underdeveloped (Shukor, 2018). These gaps call for stronger integration between sustainability frameworks and business innovation strategies (Kee et al., 2023).

Environmental Innovation (EI): Concept and Dimensions

Against the mentioned backdrop, EI has emerged as a central focus in both academic and managerial discussions on sustainability. EI is broadly defined as the development and implementation of new or significantly improved products, processes, and organizational practices that reduce environmental harm, enhance the efficient use of resources, and support the transition toward more sustainable production and consumption patterns. Rather than being limited to technological upgrades alone, EI encompasses a multidimensional approach that integrates ecological concerns into various aspects of firm behavior and strategy.

One key dimension is eco-product innovation, which emphasizes the design and development of goods with reduced environmental footprints. This involves the use of greener materials, recyclable or biodegradable components, and sustainable packaging, all aimed at lowering the life-cycle impact of products. A second dimension, eco-process innovation, refers to improvements in internal operational methods intended to decrease emissions, minimize waste, reduce energy consumption, and comply with increasingly stringent environmental regulations. These process innovations often involve cleaner technologies, resource optimization, and more efficient logistics systems.

The third dimension, eco-organizational innovation, extends the scope of EI to the structural and managerial level. It includes shifts in governance practices, corporate culture, and strategic orientation that embed environmental responsibility into the core values and operations of the organization. This may involve the creation of dedicated sustainability roles, integration of green metrics into performance evaluations, or the reconfiguration of supply chain policies to favor environmentally responsible partners (Cheng & Shiu, 2012; Liao, 2018b). Taken together, these three dimensions form a

holistic framework through which firms can institutionalize sustainability as a source of both compliance and competitive advantage.

Drivers, Challenges, and Outcomes of EI

While the benefits of EI are widely acknowledged, the outcomes have not always been consistent. For instance, Ch'ng et al. (2020) found that in Malaysia's technology sector, eco-organizational innovation exerted a strong positive influence on economic performance but had mixed results in driving social outcomes. These discrepancies are partly due to context-specific moderating factors such as market volatility, firm size, and employee engagement, which influence how EIs translate into performance improvements (Ch'ng et al., 2020; Liao, 2018a).

EI implementation is also influenced by both external pressures and internal capabilities. External drivers include regulatory compliance mandates, stakeholder and consumer activism, and shifts in investor expectations. Internally, the success of EI strategies depends on governance structures, corporate culture, leadership commitment, and talent development (Nadeem et al., 2020; Yu et al., 2017). The more agile and learning-oriented an organization is, the more effectively it can integrate environmental objectives into core business functions. Nevertheless, achieving environmental performance in isolation may not be sufficient to gain market competitiveness unless these innovations are properly communicated, positioned, and promoted—this is where MI becomes highly relevant.

Marketing Innovation (MI) and Its Role in Sustainability

MI encompasses significant changes in product design, pricing strategies, distribution channels, and promotional techniques that differentiate a firm's offerings and better address evolving consumer preferences (Gu & Su, 2018; Organisation for Economic Co-operation and Development [OECD], 2005; Tan & Cheah, 2025). Despite its critical role in aligning supply-side innovation with demand-side expectations, MI has often been underrepresented in sustainability-oriented literature. Many sustainability studies continue to focus on technological or process innovations, neglecting the strategic value of MI in shaping customer perceptions, building green brand equity, and enhancing the diffusion of EIs (D'Attoma & Ieva, 2020).

Empirical studies suggest that MI can serve as a catalyst for sustainability transitions by accelerating market acceptance of green products and reinforcing consumer trust. MI also plays a key role in conveying the firm's environmental values to stakeholders, thereby amplifying the reputational and financial returns from sustainability investments. As such, MI is not merely a promotional tool but a strategic lever that aligns internal innovation efforts with external market opportunities and social expectations. Integrating MI into the EI framework offers a more comprehensive understanding of how firms achieve SBP holistically (Geng et al., 2021).

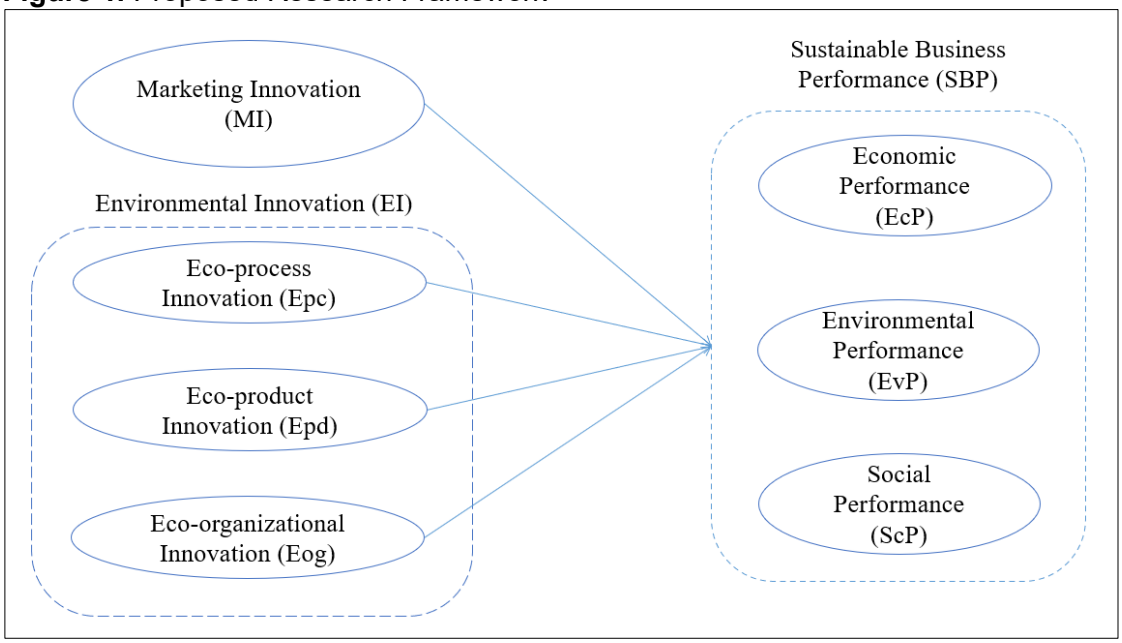
Summary of Gaps and Conceptual Framework

In sum, while the literature increasingly recognizes the role of innovation in advancing sustainable business outcomes, most studies treat environmental and MIs in silos. This fragmented approach overlooks the potential synergy between the two. Moreover, inconsistencies in empirical findings—especially concerning which dimensions of EI yield the most robust performance gains—further highlight the need for conceptual clarity. Similarly, MI remains underexplored, particularly in its role as an enabler of EI strategies. Addressing these gaps, this paper synthesizes both innovation streams into a cohesive conceptual framework to better explain how they jointly influence SBP in the Malaysian technology sector.

Building on the literature review and the research gaps identified, this study proposes a conceptual framework that integrates MI and EI as two interdependent antecedents of SBP in Malaysia's technology sector. The framework is theoretically grounded in the RBV, which posits that firm resources that are valuable, rare, inimitable, and non-substitutable (VRIN) contribute to sustained competitive advantage (Barney, 1991). Both EI and MI meet these criteria as they are knowledge-intensive, strategically deployed, and organizationally embedded.

The conceptual model (Figure 1) positions SBP as a multidimensional construct, consisting of economic, environmental, and social performance indicators. These reflect the TBL goals emphasized in global sustainability initiatives and reporting frameworks. The inclusion of both internal innovation strategies acknowledges the need for integrated responses to rising environmental expectations and competitive market demands.

Figure 1. Proposed Research Framework



EI in the framework is decomposed into its three established categories. In this framework, EI is concisely categorized into eco-product, eco-process, and eco-organizational innovation, following prior literature. Eco-product innovation supports sustainable product design that boosts brand value and regulatory alignment. Eco-process innovation enhances resource efficiency and emission control through improved operations. Eco-organizational innovation reflects internal shifts that integrate sustainability into leadership and governance structures (Cheng & Shiu, 2012; Liao, 2018b). These dimensions are proposed to influence SBP to varying degrees, based on their integration into the firm's strategic and operational agendas. This summary builds on but avoids repeating the earlier detailed discussion by emphasizing strategic positioning rather than descriptive depth.

MI, although often neglected in SBP frameworks, is introduced in this model as a complementary force that strengthens the implementation and impact of EI. It facilitates market adaptation by enabling firms to reposition green products, adopt sustainability-themed messaging, adjust pricing to reflect ethical production, and improve customer engagement with sustainability narratives (Geng et al., 2021; Gu & Su, 2018). This strategic alignment helps firms not only to capture value but also to co-create value with environmentally conscious consumers and other stakeholders.

Unlike traditional models that focus on innovation in isolation, this framework explicitly theorizes a synergistic relationship between MI and EI. Firms that simultaneously invest in both are more likely to experience enhanced performance across economic, environmental, and social domains. The synergistic interaction is especially important in dynamic sectors such as technology, where rapid product cycles, regulatory changes, and shifting consumer values demand agility and coherence between internal innovations and external market positioning.

Additionally, the framework accommodates contextual variables such as market turbulence and organizational agility, which previous studies identified as important moderators (Ch'ng et al., 2020; Shahzad, Qu, Zafar et al., 2020). These moderators can either strengthen or weaken the innovation–performance link, depending on a firm's ability to adapt under uncertainty.

By offering this integrative framework, the study contributes to both theory and practice. Theoretically, it extends the RBV to sustainability contexts by defining how innovation capabilities translate into sustainability outcomes. Practically, it offers managers and policymakers in the Malaysian technology sector a comprehensive lens to assess, strategize, and invest in innovation-driven sustainability.

RESEARCH METHOD

This study adopts a conceptual research design with the primary aim of constructing an integrated theoretical framework that links MI and EI to SBP. Unlike empirical research, which typically involves direct data collection and hypothesis testing, conceptual research is focused on theory development by synthesizing and critically evaluating existing literature. This approach is especially suitable when empirical evidence is fragmented or when emerging phenomena—such as the interplay of non-technological innovations in sustainability—require a structured conceptual foundation for future studies.

Systematic Literature Review (SLR) Approach

The conceptual framework was developed using a systematic literature review (SLR) methodology, which ensures transparency, replicability, and rigor in the identification, selection, and synthesis of prior research. The SLR process involved multiple stages, starting with an extensive keyword search across multidisciplinary databases including Scopus, Web of Science, and ScienceDirect. The review focused on peer-reviewed journal articles published between 2015 and 2020 to capture the most recent and relevant developments related to SBP, MI, and EI.

Key search terms included multiple permutations of the constructs under investigation, such as: "sustainable business performance," "sustainable firm performance," "eco-innovation," "green innovation," "environmental innovation," "marketing innovation," "corporate sustainability," and "innovation capabilities." These were combined using Boolean operators (AND, OR) to widen the scope and refine results.

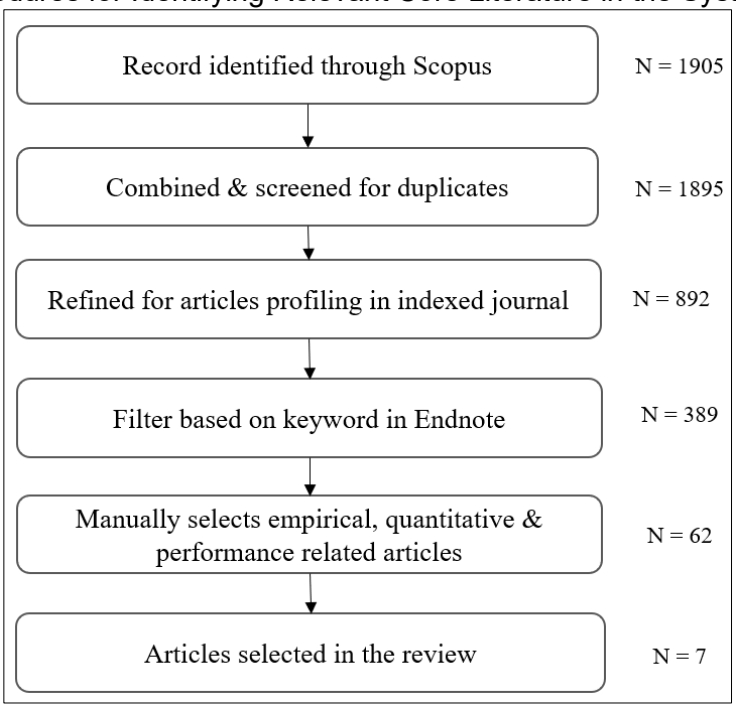
The initial search yielded 1,895 articles. A series of inclusion and exclusion criteria was then applied to filter studies based on relevance, methodological rigor, theoretical contribution, and context alignment with the technology or sustainability sectors. Priority was given to empirical articles employing quantitative or mixed method designs that clearly articulated innovation constructs and their impact on firm performance. After the filtering process—including title/abstract screening, full-text assessment, and duplication removal—seven core articles were retained for in-depth analysis.

Source Quality and Domain Relevance

To ensure the robustness and credibility of the review, the selected studies were sourced from six high-impact, peer-reviewed journals that are widely recognized for their scholarly contributions to the fields of sustainability, innovation management, and organizational studies. These journals include the International Journal of Information Management, Journal of Cleaner Production, Journal of Environmental Planning and Management, Journal of Environmental Management, Journal of Knowledge Management, and Resources, Conservation & Recycling. Each of these outlets is indexed in reputable academic databases and is known for publishing cutting-edge research at the intersection of environmental stewardship, organizational behavior, and technological or strategic innovation.

The inclusion of articles from these journals was guided by a rigorous selection protocol designed to identify relevant and methodologically sound literature. Figure 2 presents a visual outline of the procedures used to curate the core studies, detailing the steps involved in keyword mapping, targeted journal screening, and methodological quality assessment. This approach not only ensures the academic integrity of the review but also enhances the relevance and depth of the synthesized findings by focusing on journals that consistently contribute to advancing theoretical and practical insights in the domain of SBP.

Figure 2. Procedures for Identifying Relevant Core Literature in the Systematic Review



Thematic Synthesis and Framework Construction

After identifying the core articles, this SLR applied a rigorous thematic analysis to uncover recurring variables, conceptual models, and theoretical foundations associated with SBP. Central to this process was an examination of how previous studies defined and operationalized key constructs, particularly MI, EI, and SBP itself. The review also analyzed which dimensions—economic, environmental, or social—were emphasized in the measurement of SBP, and whether any studies incorporated mediating or moderating variables to explain the pathways through which innovation affects sustainability outcomes.

The analytical process was extended to a comprehensive mapping of the theoretical frameworks employed across the literature. Prominent theories included the RBV, stakeholder theory, and the dynamic capabilities framework. These perspectives provided insights into how innovation, particularly MI and EI, is positioned within the broader discourse on sustainability. The RBV emphasized the role of internal strategic resources in achieving a competitive advantage, while stakeholder theory highlighted the importance of addressing diverse environmental and societal expectations. The dynamic capabilities framework, on the other hand, sheds light on firms' abilities to adapt, reconfigure, and integrate innovations in rapidly changing environments.

Several key patterns emerged from this review. First, the majority of studies conceptualized SBP using a multidimensional approach that included economic, environmental, and social performance indicators. This reflects an increasing consensus in the literature that true sustainability must go beyond financial returns to include ecological responsibility and social equity. Second, EI—often referred to as eco-innovation—was consistently found to be a dominant driver of sustainable outcomes, especially within manufacturing and technology-intensive sectors. These innovations often involved cleaner production methods, waste reduction, and environmentally friendly product designs, all of which directly contribute to the firm's ecological footprint and regulatory compliance.

Third, MI received considerably less attention. When it was discussed, it was often treated as a complementary or secondary variable rather than a core driver of SBP. This indicates a significant gap in the literature, considering the critical role that innovative marketing strategies can play in influencing consumer behavior, market positioning, and sustainable brand development. Finally, while some studies acknowledged the relevance of organizational context—such as agility, environmental dynamism, and market turbulence—these contextual variables were not thoroughly integrated into most conceptual models, signalling another underexplored area in sustainability research.

These insights culminated in the development of a new conceptual framework, anchored primarily in the RBV. The proposed model positions marketing and EIs as intangible yet strategic organizational resources that enhance a firm's capacity to achieve SBP. Through improved adaptability, market responsiveness, and stakeholder engagement, these forms of innovation contribute to long-term value creation and competitive differentiation. The framework also underscores the need to consider external pressures and internal capabilities as interacting forces that mediate the relationship between innovation and SBP. This integrative perspective not only advances theoretical understanding but also offers practical guidance for managers seeking to align innovation strategies with sustainability goals in increasingly dynamic and complex business environments.

Justification for Conceptual Approach

The conceptual design is well-suited for this study because it allows for the exploration of underexamined theoretical relationships and provides a scaffold for future empirical testing. Given the evolving nature of sustainability practices and innovation paradigms—especially in emerging markets like Malaysia—conceptual research plays a crucial role in shaping academic discourse and informing practical strategy.

Moreover, the absence of primary data does not undermine the study's value; instead, it reinforces its role in theory building. This study offers a foundational framework that can be empirically validated using future quantitative methods (e.g., structural equation modelling [SEM], partial least squares [PLS-SEM]) or qualitative techniques (e.g., case studies, interviews) in Malaysian technology firms.

International Journal of Accounting & Finance in Asia Pasific (IJAFAP)
Vol. 8 No. 2, pp.239-256, June, 2025
E-ISSN: 2621-2862 P-ISSN: 2614-7432
https://www.ejournal.aibpmjournals.com/index.php/IJAFAP

RESULTS

Common Frameworks and Methodologies in SBP Research

The systematic review conducted for this conceptual paper reveals a strong consensus in the literature that SBP is most effectively assessed using a three-dimensional framework encompassing economic, environmental, and social performance. This aligns with the TBL concept and reflects widespread scholarly agreement that sustainability cannot be achieved through financial performance alone. All seven core studies selected in the review adopted this multidimensional approach, reinforcing its validity as the dominant evaluative framework for corporate sustainability.

Among the reviewed articles, quantitative survey methodologies were the most frequently employed. These typically utilized structured questionnaires distributed to managerial respondents within firms, capturing perceptions of innovation practices, sustainability metrics, and organizational capabilities. Some studies adopted cross-sectional designs, while a few used longitudinal approaches to analyze performance over time. However, qualitative methods such as interviews, ethnographies, or in-depth case studies were largely absent, highlighting an area for methodological diversification in future research. Likewise, modelling and secondary data analysis techniques were underutilized, despite their potential to generate insights from industry-level data and sustainability reporting disclosures.

Key Predictors of Sustainable Business Performance

The predictors of SBP identified across the core articles were diverse yet thematically clustered into three main categories. First, knowledge-related capabilities—such as knowledge management processes and absorptive capacity—emerged as critical enablers of SBP by enhancing firms' ability to acquire, assimilate, and apply relevant information. Second, innovation constructs played a significant role, with various forms of innovation, including green innovation, eco-innovation, and service innovation, being strongly linked to improved sustainability outcomes. Third, both external and internal drivers were found to influence SBP, encompassing factors such as stakeholder pressure, market turbulence, and supplier practices, all of which shape organizational responses and strategies toward sustainability.

The Central Role of Eco-Innovation

Of these, eco-innovation was the most frequently cited and empirically supported predictor. It consistently demonstrated positive effects on one or more dimensions of SBP. Studies found that when firms invest in green innovation—whether through eco-product design, clean production, or sustainability governance—these efforts yield long-term performance benefits across economic, environmental, and social metrics (Fernando et al., 2019; Geng et al., 2021).

Mediation and Moderation Effects in Innovation–Performance Relationships

Moreover, several studies tested mediation effects, especially involving green innovation and service innovation capabilities. For instance, Fernando et al. (2019) found that service innovation partially mediated the relationship between eco-innovation and SBP, suggesting that firms must complement technological changes with strategic enhancements to customer experience and delivery systems. Similarly, Shahzad, Qu, Ur Rehman et al. (2020) identified that corporate social responsibility (CSR) played a mediating role between knowledge absorptive capacity (KAC) and sustainable outcomes, implying that internal capabilities must be translated into stakeholder-relevant actions to realize their full performance potential.

In contrast to mediating variables, moderating effects were examined less frequently across the reviewed studies, yet they offered nuanced insights into the conditions under which innovation contributes to SBP. For instance, Shahzad, Qu, Zafar et al. (2020) investigated organizational agility as a moderating factor in the relationship between green innovation and sustainable performance. Their findings revealed that although agility had a positive independent effect on both green innovation and SBP, it did not significantly moderate the link between the two. This implies that agility by itself may not be sufficient to enhance the outcomes of innovation unless it is accompanied by supporting organizational structures and strategic alignment.

Meanwhile, Ch'ng et al. (2020) explored market turbulence as a moderator and found it to have a notable influence on the relationship between eco-organizational innovation and social performance. Under conditions of high market turbulence, the social benefits of eco-organizational innovation—such as improvements in employees' quality of life—were more pronounced. This suggests that external volatility can amplify the positive social impacts of innovation initiatives, especially when organizations are already embedding sustainability into their internal governance and cultural frameworks. These findings underscore the importance of contextual factors in shaping the effectiveness of innovation strategies aimed at achieving sustainable outcomes.

Limitations in Control Variable Usage and Empirical Consistency

The application of control variables—such as firm size, age, and industry sector—was inconsistent across studies. While some authors incorporated these to adjust for firm heterogeneity, others did not, possibly due to data limitations. This variability restricts generalizability and points to the need for more standardized modelling approaches in future empirical validations.

Emerging Gaps and the Underrepresentation of MI

The findings collectively highlight the evolving maturity of SBP research. The field has embraced the multidimensional performance model and established eco-innovation as a critical antecedent. However, MI remains notably underrepresented in the reviewed literature. Few studies examined its direct or indirect role in enabling sustainability outcomes, despite theoretical claims that MI enhances the market traction and legitimacy of eco-innovative efforts (D'Attoma & Ieva, 2020; Geng et al., 2021). This omission reinforces the value of the proposed conceptual framework, which integrates MI alongside EI to fill this critical gap.

Table 1. Overview of Core Literature Insights Regarding Proposed Variables

No.	Author(s)	Key Findings
1	Shahzad, Qu, Zafar et al. (2020)	• Knowledge management process positively influences green innovation (GI). • Green innovation significantly impacts corporate sustainable performance (CSP) across environmental, economic, and social dimensions. • Organizational agility positively affects GI and CSP but does not moderate the GI-CSP relationship.
2	Gupta et al. (2020)	• Cloud ERP adoption positively affects economic, environmental, and social performance of firms.
3	Jabbour et al. (2020)	• Stakeholder tension influences adoption of circular economy principles. • Circular economy practices impact firms' sustainable performance. • In contexts lacking legal frameworks, shareholders exert primary pressure on firms for sustainability adoption.

4	Ch'ng et al. (2020)	• Eco-organizational innovation positively affects economic performance in Malaysia's technology sector. • No significant direct effects on social performance, except under high market turbulence. • Employees' skills and quality of life may moderate innovation impacts.
5	Shahzad, Qu, Ur Rehman et al. (2020)	• KAC significantly enhances corporate sustainable performance and CSR. • CSR mediates the relationship between KAC and CSP.
6	Fernando et al. (2019)	• Eco-innovation and service innovation capabilities positively influence SBP. • Service innovation partially mediates the relationship between eco-innovation and SBP.
7	Huo et al. (2019)	• Green processes improve social and economic performance. • Lean processes mainly enhance economic performance.

Table 1 presents an overview of the key insights from the core literature, summarizing study findings, tested variables, and contextual notes. This synthesis indicates the prominence of eco-innovation and knowledge-related capabilities in driving SBP, while highlighting the relatively limited empirical focus on MI.

DISCUSSION

Validating the TBL Framework

The findings of the SLR affirm that SBP is optimally conceptualized through a three-pronged lens: economic, environmental, and social dimensions. This framework resonates with the TBL approach and is aligned with global sustainability benchmarks, including the United Nations' 2030 Agenda for Sustainable Development (UN, 2015). The widespread adoption of this model across reviewed studies indicates its growing maturity as a theoretical and practical foundation for assessing corporate sustainability. However, the consistency in measurement contrasts with the variation in predictors, mediators, and moderators, suggesting room for theoretical refinement and empirical standardization—gaps that this conceptual study seeks to address.

The Central Role of Innovation in Sustainable Performance

Among the variables explored, EI stands out as the most robust and consistent predictor of SBP. Its dimensions—eco-product, eco-process, and eco-organizational innovations—contribute uniquely to different aspects of firm performance. For instance, eco-organizational innovation emerged as the most influential in enhancing economic performance, particularly through improvements in strategic governance and employee engagement (Ch'ng et al., 2020). These organizational efforts often precede and support product and process innovations by fostering a culture of sustainability, clarifying internal roles, and aligning incentives with green objectives.

Moreover, eco-process innovations play a critical role in improving operational efficiency by reducing waste, energy consumption, and compliance risks. These innovations not only reduce the firm's environmental footprint but also help lower costs and improve regulatory relationships. Eco-product innovations, on the other hand, are customer-facing and can enhance brand image, customer loyalty, and product differentiation—factors that directly contribute to long-term financial and market performance (Song et al., 2020). However, the performance outcomes of these dimensions vary across industry contexts, organizational readiness, and external pressures, reinforcing the

importance of organizational agility and market turbulence as contingent factors (Ch'ng et al., 2020; Shahzad, Qu, Zafar et al., 2020).

In contrast to the well-established link between EI and SBP, the role of MI in driving sustainability remains underexplored in the reviewed literature. This oversight is surprising given that MI is increasingly recognized as a strategic enabler of sustainability-oriented business models. MI comprises novel changes in how firms position, promote, and deliver products to meet evolving consumer values and regulatory expectations (Gu & Su, 2018; Tan & Cheah, 2025). It can amplify the impact of EI by improving consumer awareness, accelerating the adoption of green products, and reinforcing CSR narratives. MI also enables firms to segment markets more effectively, personalize sustainability offerings, and optimize pricing strategies that reflect environmental attributes.

Theoretical Integration and Innovation Synergy

Framing both EI and MI within the RBV adds theoretical robustness to the proposed model. RBV posits that internal resources must be valuable, rare, inimitable, and non-substitutable (VRIN) to provide a competitive advantage (Barney, 1991). EI and MI meet these conditions when strategically aligned and supported by organizational capabilities. While EI improves environmental legitimacy and operational resilience, MI enhances stakeholder engagement and market responsiveness. Their synergistic deployment—rather than isolated application—is likely to yield superior sustainability outcomes. This insight is critical for firms in dynamic industries such as technology, where innovation cycles are rapid, customer expectations are fluid, and regulatory landscapes are increasingly stringent (Geng et al., 2021).

Another key insight is the lack of integrative models in the literature that position EI and MI as complementary rather than standalone capabilities. Most empirical studies treat innovation types in isolation, overlooking the interactive effects that could emerge from their concurrent implementation. This conceptual paper addresses this gap by proposing a framework where EI and MI jointly serve as strategic drivers of SBP. The framework contributes to the innovation-sustainability discourse by moving beyond product or technology-centric views to include organizational and market-facing innovations.

Contextual Influences and Practical Implications

Moderating factors such as organizational agility and market turbulence are important boundary conditions that influence the efficacy of innovation strategies. Firms with high agility can reconfigure their innovation processes quickly in response to external shocks, regulatory shifts, or competitive threats, thereby sustaining performance under dynamic conditions (Shahzad, Qu, Zafar et al., 2020). Similarly, high market turbulence can magnify the benefits—or the risks—of innovation investments. For instance, in turbulent markets, eco-organizational innovation may have a greater impact on social performance as firms engage in proactive stakeholder management to maintain trust and legitimacy (Ch'ng et al., 2020).

From a practical perspective, the proposed conceptual framework offers clear guidance for managers and policymakers, particularly in Malaysia's technology sector. It encourages firms to integrate marketing and EIs, not just for compliance or reputation, but as part of their core strategic toolkit. Managers should prioritize internal capability building, cross-functional collaboration, and alignment between R&D and marketing units to support innovation synergies. Policymakers, in turn, can promote this integration by designing incentive schemes that reward both environmental and market-driven innovation practices, thus creating a more supportive ecosystem for sustainable business transformation.

Future Research Directions

While this conceptual study advances theoretical understanding, it also highlights several opportunities for future empirical inquiry. First, researchers are encouraged to test the proposed framework using robust quantitative methods such as structural equation modelling (SEM) or partial least squares (PLS-SEM) to validate the hypothesized relationships. This can help determine the magnitude and directionality of EI and MI's effects on SBP.

Second, longitudinal studies are needed to observe how innovation synergies evolve over time and respond to dynamic market conditions. Such studies can shed light on the temporal dimension of sustainability innovation, revealing how short-term investments translate into long-term performance.

Third, qualitative research—such as multiple case studies or grounded theory analysis—can provide rich, contextual insights into the organizational processes and leadership behaviors that enable the successful integration of EI and MI. This is especially useful for understanding barriers to innovation adoption in small and medium-sized enterprises (SMEs), which are prominent in Malaysia's business landscape.

Lastly, comparative studies across industries and national contexts would enhance the generalizability of findings. By examining how different regulatory environments, cultural factors, or market structures influence innovation effectiveness, future research can refine the framework and inform targeted interventions.

CONCLUSION

This conceptual study advances scholarly understanding of SBP in Malaysia's technology sector by proposing an integrated framework that synthesizes MI and EI as interdependent strategic resources. Drawing upon the RBV and supported by an SLR, the study demonstrates how these two forms of innovation jointly drive firm performance across economic, environmental, and social dimensions—the pillars of the TBL framework.

While EI has long been recognized for its role in reducing environmental impact and enhancing operational resilience, this paper positions MI as an equally critical yet underutilized lever in achieving sustainability outcomes. By promoting new ways to position green products, connect with environmentally conscious consumers, and communicate sustainability narratives, MI plays a pivotal role in scaling and amplifying the impact of environmental initiatives. Their complementary interplay is especially important for technology-driven firms operating in dynamic and competitive markets, where innovation speed, adaptability, and stakeholder responsiveness determine long-term viability.

The proposed framework responds to several gaps identified in the literature. First, it addresses the fragmentation in sustainability research that often treats different innovation types in isolation. Second, it contributes conceptually by theorizing the synergy between EI and MI, which has been underexplored in prior studies despite its strong theoretical potential. Third, it reinforces the RBV's relevance by contextualizing innovation as a strategic capability that enables firms to co-create environmental, social, and financial value.

From a practical standpoint, the framework offers actionable insights for business leaders and policymakers. Technology firms in Malaysia—and potentially in similar emerging market contexts—can use this model to design integrated sustainability

strategies that leverage both internal process improvements and market-facing innovations. Managers are encouraged to foster cross-functional collaboration between environmental compliance teams and marketing departments, ensuring that innovations are not only implemented internally but also visible and credible to external stakeholders. Policymakers, in turn, may consider multi-dimensional incentive structures that support both types of innovation simultaneously, fostering a more robust and innovation-driven green economy.

Despite these contributions, the study is bounded by its conceptual nature and the lack of empirical validation. While the literature synthesis was systematic and grounded in high-quality sources, the absence of primary data means that the framework's hypotheses remain theoretical. Future research is needed to empirically test and refine this model across different organizational settings. Methods such as quantitative modelling, longitudinal analysis, and qualitative case studies will be instrumental in validating the relationships and mechanisms proposed.

Furthermore, this study recognizes that innovation does not occur in a vacuum. Moderating variables such as market turbulence, organizational agility, and leadership commitment may significantly influence the extent to which MI and EI drive sustainable performance. Future studies could explore these contingencies to provide a more nuanced and context-sensitive understanding of innovation outcomes.

In conclusion, this paper underscores the critical need for integrated innovation approaches in driving sustainable business success. By bridging the gap between marketing and EI, it enriches both the theoretical discourse and practical toolkits available to organizations striving for long-term sustainability. The study contributes to a growing body of knowledge that positions innovation not merely as a technological imperative but as a strategic, multidimensional enabler of competitive, responsible, and resilient enterprise performance.

ACKNOWLEDGMENT
The authors sincerely thank all individuals who provided valuable insights, feedback, and encouragement throughout the development of this conceptual study. We also gratefully acknowledge the broader academic community, whose published literature and scholarly discussions have significantly contributed to shaping the foundation and direction of this research.

DECLARATION OF CONFLICTING INTERESTS
The authors declare that there is no conflict of interest.

REFERENCES

Amran, A., Tharumarajah, N., & Cheah, J. S. S. (2023). Surviving and thriving in the COVID-19 crisis: Performance drivers and resource dynamics of social enterprises in a nascent ecology. *Journal of Cleaner Production*, *428*, 139252. https://doi.org/10.1016/j.jclepro.2023.139252

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

Ch'ng, P. C., Cheah, J., & Amran, A. (2020). Eco-innovation practices and sustainable business performance: The moderating effect of market turbulence in the Malaysian technology industry. *Journal of Cleaner Production*, *258*, 120870. https://doi.org/10.1016/j.jclepro.2020.120870

Cheah, J. S. S., Ng, C-H., Fianto, B. A., Teoh, A. P., Gan, C., & Anisha, A. I. I. N. (2024). Green innovation as a strategic imperative for sustainable business performance:

Evidence from Malaysian industries during the COVID-19 pandemic. *Journal of Cleaner Production*, *470*, 143355. https://doi.org/10.1016/j.jclepro.2024.143355

Cheah, J. S., Amran, A., Kirubakaran, M., Lang, D. J., Su, P. F., & Chu, J. W. (2023). A transdisciplinary framework for university-industry collaboration in establishing a social business model. *Social Enterprise Journal, 19*(4), 390–403. https://doi.org/10.1108/SEJ-11-2022-0111

Cheah, J. S., Loh, S., & Gunasekaran, A. (2023). Motivational catalysts: The dominant role between prosocial personality and social entrepreneurial intentions among university students. *Social Enterprise Journal, 19*(5), 555–574. https://doi.org/10.1108/SEJ-04-2023-0036

Cheng, C. C., & Shiu, E. C. (2012). Validation of a proposed instrument for measuring eco-innovation: An implementation perspective. *Technovation*, *32*(6), 329–344. https://doi.org/10.1016/j.technovation.2012.02.001

Chiew, K.-Z., & Cheah, J. S. S. (2025). Reassessing ICT adoption among Malaysian SMEs: A Post-COVID-19 thematic literature review using TOE framework. *Journal of the Community Development in Asia*, *8*(2), 249–265. https://doi.org/10.32535/jcda.v8i2.3893

D'Attoma, I., & Ieva, M. (2020). Determinants of technological innovation success and failure: Does marketing innovation matter?. *Industrial Marketing Management*, *91*, 64-81. https://doi.org/10.1016/j.indmarman.2020.08.015

Fernando, Y., Jabbour, C. J. C., & Wah, W. X. (2019). Pursuing green growth in technology firms through the connections between environmental innovation and sustainable business performance: Does service capability matter?. *Resources, Conservation and Recycling*, *141*, 8-20. https://doi.org/10.1016/j.resconrec.2018.09.031

Geng, D., Lai, K. H., & Zhu, Q. (2021). Eco-innovation and its role for performance improvement among Chinese small and medium-sized manufacturing enterprises. *International Journal of Production Economics*, *231*, 107869. https://doi.org/10.1016/j.ijpe.2020.107869

Gu, Y., & Su, D. (2018). Innovation orientations, external partnerships, and start-ups' performance of low-carbon ventures. *Journal of Cleaner Production*, *194*, 69-77. https://doi.org/10.1016/j.jclepro.2018.05.017

Gupta, S., Meissonier, R., Drave, V. A., & Roubaud, D. (2020). Examining the impact of Cloud ERP on sustainable performance: A dynamic capability view. *International Journal of Information Management*, *51*, 102028. https://doi.org/10.1016/j.ijinfomgt.2019.10.013

Huo, B., Gu, M., & Wang, Z. (2019). Green or lean? A supply chain approach to sustainable performance. *Journal of Cleaner Production*, *216*, 152-166. https://doi.org/10.1016/j.jclepro.2019.01.141

Jabbour, C. J. C., Seuring, S., de Sousa Jabbour, A. B. L., Jugend, D., Fiorini, P. D. C., Latan, H., & Izeppi, W. C. (2020). Stakeholders, innovative business models for the circular economy and sustainable performance of firms in an emerging economy facing institutional voids. *Journal of Environmental Management*, *264*, 110416. https://doi.org/10.1016/j.jenvman.2020.110416

Kee, D. M. H., Lee, J. V. K., Azlan, I. Y. A. B., Koay, J. C. W., Putri, A. M., Asthana, R., ... & Beg, A. (2023). Sustainability in the food and beverage industry: A comparative study of Malaysia, India, and Indonesia. *International Journal of Tourism and Hospitality in Asia Pacific*, 6(3), 1–17. https://doi.org/10.32535/ijthap.v6i3.2591

Liao, Z. (2018a). Corporate culture, environmental innovation and financial performance. *Business Strategy and the Environment*, *27*(8), 1368-1375. https://doi.org/10.1002/bse.2186

Liao, Z. (2018b). Environmental policy instruments, environmental innovation and the reputation of enterprises. *Journal of Cleaner Production*, *171*, 1111-1117. https://doi.org/10.1016/j.jclepro.2017.10.126

Nadeem, M., Bahadar, S., Gull, A. A., & Iqbal, U. (2020). Are women eco-friendly? Board gender diversity and environmental innovation. *Business Strategy and the Environment*, *29*(8), 3146-3161. https://doi.org/10.1002/bse.2563

Organisation for Economic Co-operation and Development (OECD). (2005). *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data* (3rd ed.). OECD Publishing. https://doi.org/10.1787/9789264013100-en

Porter, M. E., & Kramer, M. R. (2018). Creating shared value: How to reinvent capitalism—And unleash a wave of innovation and growth. In *Managing Sustainable Business: An Executive Education Case and Textbook* (pp. 323-346). Springer Netherlands. https://doi.org/10.1007/978-94-024-1144-7_16.

Quyen, T. N., Cheah, J. S., & Amran, A. (2024). Macro-institutional effects on social enterprise performance: A conceptual paper based on literature review. *Global Business & Management Research*, *16*(3).

Rajah, N., Amran, A., & Cheah, J. (2022). Determinants that enhance resilience and performance of social enterprises in Malaysia: A conceptual framework. *Journal of Governance and Integrity*, *5*(3), 297-307. https://doi.org/10.15282/jgi.5.3.2022.8981

Shahzad, M., Qu, Y., Ur Rehman, S., Zafar, A. U., Ding, X., & Abbas, J. (2020). Impact of knowledge absorptive capacity on corporate sustainability with mediating role of CSR: Analysis from the Asian context. *Journal of Environmental Planning and Management*, *63*(2), 148-174. https://doi.org/10.1080/09640568.2019.1575799

Shahzad, M., Qu, Y., Zafar, A. U., Rehman, S. U., & Islam, T. (2020). Exploring the influence of knowledge management process on corporate sustainable performance through green innovation. *Journal of Knowledge Management*, *24*(9), 2079-2106. https://doi.org/10.1108/JKM-11-2019-0624

Shukor, M. M. L. (2018). *The Initial Assessment of The Sustainable Development Goals (SDG) Indicators for Malaysia (SDG Matrix) 2016-2018*. Department of Statistics Malaysia. https://sesricdiag.blob.core.windows.net/sesric-site-blob/files/SDG_Assessment_of_SDGs_EN.pdf

Song, W., Wang, G. Z., & Ma, X. (2020). Environmental innovation practices and green product innovation performance: A perspective from organizational climate. *Sustainable Development*, *28*(1), 224-234. https://doi.org/10.1002/sd.1990

Tan, Z. Y., & Cheah, J. S. (2025). Beyond good intentions: Why consumers choose social enterprise products. *Social Enterprise Journal*. https://doi.org/10.1108/SEJ-08-2024-0124

Teoh, K.-S., & Cheah, J. S. S. (2025). Enhancing SME resilience during COVID-19: A systematic review of digital capabilities, relational strengths, and organizational agility. *Journal of the Community Development in Asia, 8*(2), 266–284. https://doi.org/10.32535/jcda.v8i2.3894

Tsalis, T. A., & Nikolaou, I. E. (2017). Assessing the effects of climate change regulations on the business community: A system dynamic approach. *Business Strategy and the Environment*, *26*(6), 826-843. https://doi.org/10.1002/bse.1953

United Nations (UN). (2015). *Transforming our world: The 2030 agenda for sustainable development*. United Nations. https://sdgs.un.org/2030agenda

Yu, W., Ramanathan, R., & Nath, P. (2017). Environmental pressures and performance: An analysis of the roles of environmental innovation strategy and marketing capability. *Technological Forecasting and Social Change*, *117*, 160-169. https://doi.org/10.1016/j.techfore.2016.12.005

Zhang, Y., Sun, J., Yang, Z., & Wang, Y. (2020). Critical success factors of green innovation: Technology, organization and environment readiness. *Journal of Cleaner Production*, *264*, 121701. https://doi.org/10.1016/j.jclepro.2020.121701

ABOUT THE AUTHOR(S)

1st Author
Chu Hui Ng is an MBA student from Graduate School of Business, Universiti Sains Malaysia. She received her Bachelor's Degree in Electrical & Electronics Engineering in collaboration with the University of Bradford, U.K. She is currently working as a Senior Electronics Engineer, working alongside the EE team at the Research & Development Department and cross-functional departments of a Fortune 500 company, with a focus on developing new product designs. Her previous study involved examining environmental or green innovation and sustainable business performance from the perspective of major industries in Malaysian organizations.
Email janneyng@gmail.com
ORCID: https://orcid.org/0009-0009-9681-5610

2nd Author
Dr. Jeffrey S. S. Cheah is a Senior Lecturer, Program Manager, and Exco Member at the Graduate School of Business, Universiti Sains Malaysia (USM). He chairs the Pitch@USM Organizing Committee and is an Associate Editor for a social entrepreneurship journal. Additionally, he is an advisory board member of the Sustainability Leadership & Impact Management (SLIM) Consortium and a visiting scholar at the National Central University in Taiwan. His professional affiliations include the Institute of Social Entrepreneurship in Asia (ISEA), the Asian Institute for Impact Measurement & Management (AIIMM), and formerly, The Hong Kong Polytechnic University. Dr. Jeffrey specializes in corporate strategy formulation & implementation, social entrepreneurship, and sustainable business practices.
ORCID ID: https://orcid.org/0000-0001-5783-5445
Email: jeffrey_cheah@usm.my