EXAMINING INFLUENTIAL ELEMENTS IMPACTING PERFORMANCE IN SUSTAINABLE MANUFACTURING WITHIN MALAYSIAN ENTERPRISES: A CONCEPTUAL ANALYSIS

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ABSTRACT

This study aims to examine the impact of sustainable manufacturing factors on the performance of Malaysian manufacturing enterprises. It emphasizes sustainable innovation, quality, cost efficiency, delivery, and operational flexibility. This study adopted Dynamic Capabilities theory and aims to offer beneficial insights to manufacturing enterprises in Malaysia. The primary purpose is to propose a conceptual model for sustainable manufacturing which enhances organizational performance. This study needs more empirical validation in literature, especially on dynamic capabilities, sustainable innovation and flexibility dimensionality in predicting organizational performance, since all three factors presented a strong theoretical basis for affecting organizational performance. Future studies should explore quantitative methods and alternative samples to improve generalizability of the results. This conceptual study highlights the role that sustainable innovation and flexibility play in determining organizational performance, while also illustrating the need to incorporate these factors within sustainable manufacturing methodologies. In addition, it provides manufacturing enterprise stakeholders with insights that help them reinforce their strategic narrative to the advantages of sustainable manufacturing. The study not only offers valuable insight to policy makers, industry experts and the academic community, but it also highlights the need for more empirical research to explore and examine upon these conceptual insights.

Keyword: Sustainable manufacturing factors, organizational performance, dynamic capabilities, Malaysian manufacturing enterprises, Dynamic Capabilities View.

INTRODUCTION

The manufacturing sector is one of the critical pillars of the Malaysian economy, contributing the second largest share to both GDP and Foreign Direct Investment (FDI) (Bank Negara Malaysia, 2023). In 2016, the manufacturing sector achieved RM58.49 billion in capital investment, with RM31.08 billion coming from domestic sources and RM27.42 billion from foreign investments (Economic Planning Unit, Prime Minister's Department, 2022).

This growing manufacturing industry contributed significantly to Malaysia's GDP development, achieving RM253.9 billion (22.78 percent) of total domestic product value. It offered job opportunities for 1.05 million people, proving its importance in the labor market. The Twelfth Malaysia Plan (RMK-12) had set high aspirations for the country aiming for a 4 to 4.5 percent GDP annual growth rate, focused on the services and manufacturing sectors (Ministry of Economy Malaysia, 2023). Malaysia's business entities have surged to 920,624, of which 98.5 percent or 907,065 are Small and Medium Enterprises (SME Corp, 2020). This resulted in a robust labor market. in 2023, there were 2.52 million individuals in the manufacturing workforce (Ministry of Economy, 2023). Overall, Malaysia's manufacturing sector continues to be a key driver of economic growth, which contributing significantly to GDP, foreign direct investment (FDI), and employment.

Research in strategy management related to organizational performance has a long debate especially for business organizations (Ahuja & Khamba, 2008; Lin & Wu, 2014; Brundage, Chang, Arinez & Xiao, 2016; Chan, Ngai & Moon, 2017). As a reaction to the increasing competition at the marketplace and to technology development, organizations are required to actively measure and enhance their manufacturing processes, as well as to take initiative in developing new products and technologies with the objectives of short-term profits and long-term competitive advantages (Walker, 2004; Dangelico, Pujari, & Pontrandolfo, 2017).

There has been a growing body of literature investigating the relationship among organizational performance (Ahuja & Khamba, 2008; Lin & Wu, 2014; Brundage, Chang, Arinez & Xiao, 2016; Chan, Ngai & Moon, 2017; Dangelico, Pujari & Pontrandolfo, 2017), sustainable manufacturing factors (Hall, 2000; van Weenen, 2000; Amrina & Yusof, 2011; Hussin & Kunjuraman, 2015; Boron, Murray & Thomson, 2017) and sustainable manufacturing factors. However, those fields and concepts of inquiry have often been pursued in isolation, leading to conflicting results.

To fill this gap, this study investigates the direct effect of sustainable manufacturing factors on organizational performance in manufacturing enterprises of Malaysia. The objective of this study is to understand how the interconnected dynamics of sustainable manufacturing factors and organizational performance influence each other in Malaysia's manufacturing sector, an insight that this study seeks to advance. While there are several government initiatives in this regard, there is an important gap that required to examine at the critical areas determining the overall performance of organizations in Malaysian manufacturing. Despite existing studies on sustainable manufacturing factors and organizational performance still providing diverging

findings, the available literature lacks knowledge about which sustainable manufacturing practices are impactful for manufacturing enterprises in Malaysia. The findings of earlier studies are still in their early stages. Hence, a deeper understanding of the factors contributing to sustainable manufacturing and its influence on business success is needed (Chaurasiya & Signh, 2023; Nawanir et al., 2020).

With the pursuit, this study seeks to answer the below research question: What are the specific factors of sustainable manufacturing that contribute to organizational performance in Malaysian manufacturing enterprises? Identifying these factors is important for practitioners and policymakers to establish proper measures and criteria to advocate for sustainable manufacturing practices within organizations. To support this study, the Dynamic Capabilities Theory will be applied as the underlying framework. This study is arranged in four sections. Introduction provides an overview and thoroughly elucidates the variables of sustainable innovation, quality, cost, delivery and flexibility. This study examines the relationship of sustainable manufacturing practices to organizational performance. It emphasizes the need to comprehend these factors to enhance sustainable manufacturing and increase performance in the manufacturing sector of Malaysia.

LITERATURE REVIEW

Theory

Dynamic Capabilities, or Dynamic Capabilities View (DCV) refers to the organizational capacity to build, integrate, and reconfigure internal and external competencies to pursue rapidly changing environments (Teece, 2007; Fang & Zou, 2009). Intended as a series of distinctive organizational processes, DCV is essential for adapting to the evolution of markets (Eisenhardt & Martin, 2000). It provides a framework in which firms in the context of their business operations and production processes expand and adapt to sustainable changes, including resource and capability management (Wu et al., 2012; Lin et al., 2016; Ramanathan et al., 2017). In addition, DCV also provides both conceptual and practical basis for implementing sustainable transformations in organizational business strategy, operations and cost management aspects of organizations, leading to long run economic sustainability and sustained competitive advantage (Wu et al., 2012).

This research focuses on the identification of sustainable manufacturing factors based on the application of dynamic capabilities theory approach. According to literature, sustainable manufacturing factors can generate their own dynamic capabilities (Amrina & Vilsi, 2015; Winroth et al., 2016; Aichouni et al., 2024). As concerns about environmental regulation and social needs heighten, companies find themselves under increasing pressure to adopt sustainability principles (environmental, social and economic) into their business practices and goals. Achieving this balance is considered key to achieving sustainable competitive advantage throughout industries and across geographies. In this regard, scholars promote the idea of dynamic capabilities that bring value to both organizations and their customers by organizing a process of production that is effective and efficient, hence increasing the overall performance

level of an organization and maintaining a lasting value advantage over competitors (Wu et al., 2012; Lin et al., 2016; Ramanathan et al., 2017; Aichouni et al., 2024).

Organizational Performance

As highlighted by Abdel-Maksoud (2004), assessing organizational performance involves exploring it with respect to both financial and non-financial dimensions. Research conducted by scholars such as Ittner and Larcker (2003), Pintelon, Pinjala and Vereecke (2006) and Ahuja and Khamba (2008) revealed that the entire profit accounted for a clear and accurate representation of an end-to-end customer order fulfilment process comprising not only financial but also a well-defined performance measures description across multi factors mapped within a supply chain. In complex industrial processes functioning, tangible indicators for non-financial parameters play a huge role in sustaining required capacities across industrial organizations and therefore provides insight for specific capacity achievements before engaging any costly financial decisions (Rosen & Kishawy, 2012; Lin & Wu, 2014). Hassan, Nordin and Ashari (2015) further explained that financial solutions alone are insufficient. Therefore, non-financial ways need to be considered to solve specific challenges in manufacturing production operations in which they ultimately will result in improved results and monetary advantages (Damanpour & Evan, 1984). This research applies a theoretical model to examine the combined constructs of non-financial and financial dimensions as a dependent variable of organizational performance, acknowledging their interrelationship and joint influence (Ittner & Larcker, 2003).

Alignment in the dynamic implications of absorptive, adaptive, and innovative capabilities support the positive relationships between these sustainable manufacturing factors and performance (Cabral, 2000; Wu et al. (2012). Researchers like Yang et al. (2009), Amrina and Yusof (2011) and Jain and Ahuja (2012) also evaluated sustainable manufacturing factors in determining organizational performance and they found significant relationships with innovation, quality, cost, delivery, flexibility, time, and employee factors, ultimately lead to higher organizational performance and sustainable development. A similar study conducted among manufacturing enterprises in Caribbean found that the enterprises emphasized the health, well-being, and safety of respective workers, involved their community programs, and performed socially responsible actions to strengthen brand loyalty. Their measures have included improving employee morale and retention, exploring sustainability alternatives, and embracing environmental and social expectations to compete with rivals (Millar and Russell, 2011). In summary, this synthesis highlights the complexity of financial and non-financial perspectives in assessing organizational performance and the paramount importance of sustainable manufacturing elements in achieving the desired results within organizations.

Sustainable Manufacturing Factors

Sustainable manufacturing factors has emerged as critical resource for organizations, receiving broad academic recognition in the recent literature (Montabon, Sroufe, & Narasimhan, 2007; Henri & Journeault, 2008; Mani, Lyons, & Sriram, 2010; Amrina & Yusof,

2011; Vinodh & Joy, 2012). These factors are essential to all manufacturing processes as they assist in developing capabilities, technology and working practices in manufacturing enterprises (Amrina & Yusof, 2011; Vinodh & Joy, 2012). The Dynamic Capabilities Theory is the most influential framework from the literature for understanding the origin of competitive advantage and the differential performance of organizations (Neches et al., 1991, Makadok, 2001, Lin & Wu, 2014, Islam, Jasimuddin, & Hasan, 2017).

Sustainable manufacturing can be observed in modern manufacturing enterprises. Consistency and sustainability must be pursued by these businesses through the integration of measuring, assessing, and improving the performance of manufacturing operations and through the development of novel products and technologies in agreement with heterogeneous social, environmental, and economic contexts (Peet et al. 2011; Amrina and Yusof 2011; Amrina and Vilsi 2015). Sustainable manufacturing is described as the combination of capabilities that encourage sustainability and reduce several business threats into all qualifications in manufacturing process and systems (Henri & Journeault, 2008; Mani et al., 2010). This approach guarantees that every job function in manufacturing processes and products is built in a sustainable, informed, and competitive way (Tocan, 2012). These factors are critical, as sustainable manufacturing has been cited as a key means of achieving improved organizational performance, greater competitiveness, and addressing the needs of contemporary business in terms of sustainability and innovation (Chaurasiya & Singh, 2023).

a. Sustainable Innovation

Sustainable innovation refers to bringing new or refined products, services, technology or organizational systems. It yields better economic performance, while at the same time improving environmental and social components (Cabral, 2010; Jorna, 2017). According to Tello and Yoon (2008), sustainable innovation focuses on the generation of new goods, processes, services, and technology that satisfy human needs and foster well-being while respecting natural resources and regenerative capacity. In addition, Calik and Bardudeen (2016) define sustainable innovation as any new or significant development of the organizational manufacturing processes, which produces not only economic benefits, but also positive social and environmental impacts.

Current studies reflect an increasing focus on sustainable innovation and the author supports it as an area of interest for triple-bottom-line organizations (Nayak et al., 2023, Dutta, 2023; Chaurasiya & Singh, 2023). Sustainable innovation is different from traditional innovation methodologies since it considers economic, social, and environmental issues in its methods and strategies (Cabral, 2010; Calik and Bardudeen, 2016). Against the constantly changing environment and business scenario, emphasis has been placed on sustainable innovation as a strategic pillar for long-term economic success (Adams et al., 2016). In the global context, manufacturers and retailers emphasize sustainable innovation in their global sourcing and supply chain strategies, by establishing operational excellence and cost efficiency in their production systems (Ebrahimi, Moosavi, & Chirani, 2016). Thus, the synthesis highlights various characteristics of sustainable innovation, including economic, social, and

environmental aspects, alongside its decisive importance in attaining a competitive advantage, and practical efficiency in today's corporate world.

There are few academic studies explaining the importance of sustainable innovation and organizational performance (Setyadi & Hastuti, 2024; Saxena et al., 2024). As mentioned by Calik and Bardudeen (2016), the process of sustainable process innovation consists of recycling, remanufacturing and reusing materials or products to achieve better sustainability and organizational performance in the manufacturing process. Furthermore, Jorna (2017) also argues that sustainable innovation requires leveraging adopters' knowledge and capabilities to adjust, innovate, and reconfigure organization production recipes to lower the rates of process failures and be adaptable to changing environments quickly. This would enhance operational excellence and cost-effective operations in their manufacturing system (Ebrahimi et al., 2016).

b. Quality

Quality refers to how much a product or service meets and exceeds customer needs, as determined by the customer (Reeves & Bednar, 1994). While starting in the early 70's, cost and production were prioritized above quality by organizations. Yet in the United States in the 1980s, a Japanese-led organization showed that priority on all three dimensions simultaneously, quality, cost, and delivery (QCD), was necessary to secure an edge over the competition (Tomaskovic-Devey & Lin, 2011). Since then, quality has evolved in a strategic direction to increase organizational profitability and maximizing customer satisfaction through minimizing errors and or mistakes (Agus & Hajinoor, 2012).

Malaysian manufacturing enterprises are increasingly being challenged to produce a quality product while also seeking to enhance the efficiency of their operations (Shakir & Mohammed, 2013; Abdul-Rashid et al., 2017). Initiatives for quality and performance improvement across operations are key to long term competitive advantage and growth for these organizations (Anuar, 2015; Anuar et al., 2016). The highest production quality seems essential for competitiveness, while achieving excellence in production quality is regarded as a strategic imperative in manufacturing firms, including quality of manufacturing, customer order fulfillment, process defect reduction and fewer customer warranty problems (Ahuja & Khamba, 2008; Agus & Hajinoor, 2012; Anuar, 2015; Anuar et al., 2016).

Research by Marin and Ruiz-Olalla (2011) identified a positive relationship between manufacturing quality and overall performance of an organization. Organizations aiming for organizational success through the successful implementation of manufacturing quality must first assess their objectives for quality management, create goals, and derive implementation plans, as elucidated by Ahuja and Khamba (2008) and Jain and Ahuja (2012). Internal motivations for manufacturing quality implementation should produce external benefits within the organization, such as incremental improvements in customer order compliance, total process defect reduction and customer warranty reduction (Anuar, 2015). This synthesis highlights the emerging perspective of quality as an operational priority and its crucial

importance on the successes of organizations and competitiveness of Malaysian manufacturing companies.

c. Cost

Nordin and Adebambo (2016) categorize the economic growth factors of sustainable manufacturing practices into production costs and investment costs. In Malaysia, Nordin and Adebambo (2016) revealed in their descriptive analysis that the manufacturing industry has achieved significant decreases in manufacturing costs. Manufacturing costs (often a quantitative measure) comprise direct cost reduction (labour, materials and other product-specific costs) and overhead cost reduction (administrative costs, equipment costs, maintenance cost and depreciation expense of the plant) (Sillanpaa & Kess, 2011; Beamon, 1999; Chan, 2003; Chan & Qi, 2003; Theeranuphattana & Tang, 2008).

The sustainable factors in manufacturing significantly influence an organization's production cost (Ahuja & Khamba, 2008). By understanding these phenomena, it helps minimize production costs by ensuring there would be no unplanned breaks, technical problems and losses in the production process (Shagluf, Longstaff, & Fletcher, 2014; Paprocka, Kempa, Kalinowski, & Grabowik, 2015). Literature confirms that cost reduction along with sales increment and enhanced financial performance are experienced from sustainable manufacturing (Kasbun, Teh, & Ong, 2016; Ameer & Othman, 2012). According to Kasbun et al. (2016), the investment cost acts as an incentive to boost resource allocation adaptability and efficacy, enhance R&D effectiveness, and develop organizational capabilities to leverage business opportunities in a competitive environment.

The competitiveness of sustainable manufacturing, particularly in cost management, entails pursuing short-term cost-cutting activities (Christmann, 2000). Transforming practices into capabilities, focusing on cost efficiency, and incorporating cost management into the manufacturing process could have a more beneficial impact on profits than depending exclusively on short-term cost-cutting measures. González et al. (2012) emphasize the prospective integration of cost management into the manufacturing process to impact good organizational performance, hence contributing to broader organizational benefits and long-term competitive advantage. This synthesis emphasizes the interdependence of sustainable manufacturing elements, cost management, and organizational performance, with a focus on cost management's role in ensuring long-term economic growth and competitiveness.

Particularly the competitiveness generated by sustainable manufacturing is leveraged through short-term cost management activities (Christmann, 2000). Focusing on practices that can effectively create capabilities, emphasizing cost efficiency and reframing cost management as a process in manufacturing can contribute much more positively to profits than relying strictly on short term cost reduction. González et al. (2013) argued that the potential for increasingly incorporating cost management into the production process to create positive organizational performance, and ultimately provide broader organizational benefits and longer-term competitive advantage.

d. Delivery

In the modern knowledge-based economy, delivery is everything (Yahya & Goh, 2002; Wong, 2005; Khosravi & Ahmad, 2014). Organizations increasingly continue to work on improving their delivery processes to quickly focus on new customer segments and to explore new opportunities (Toni & Tonchia, 2001; Christiansen et al., 2003; Abdel-Maksoud, 2004; Jain & Ahuja, 2012). They are embracing agile, responsive, and adaptable production systems and services for customers together with applying sustainable development practices (Jayal et al., 2010; Tseng, 2013; Varsei et al., 2014; Hřebíček et al., 2015). Optimizing production systems from a decentralized, results-oriented and empowering perspective (Tseng, 2013). Moreover, organizations employ information technologies to reengineer delivery processes, improve services, increase efficiency, and lower costs (Jain & Ahuja, 2012; Amrina et al., 2016).

Based on the study by Katayama and Bennett (1999), Japanese companies deliver in different measures based on operational, supply, order fulfillment, and product development processes to show the higher agility and adaptability. A few of the sub-measures related to delivery are timely delivery, reliable delivery, expedited delivery times, delivery service, delivery frequencies, delivery synchronization, delivery speed and lead time to fulfill an order and companies' metrics of their suppliers on delivery (Jayal et al., 2010; Tseng, 2013; Varsei et al., 2014; Hřebíček et al., 2015). Although historically, delivery in production was only limited to operative activities and not considered as a competitive advantage, recent literature highlights its strategic role and strong positive effect on financial performance (Christiansen et al., 2003; Dan & Liu. 2023; Yang et al., 2024).

Delivery is deemed a crucial aspect of the firm's value chain and a strategic decision area leading to enhanced organizational performance (Christiansen et al., 2003). It is considered a fundamental pillar for developing distinctive capabilities in the production system (Tseng, 2013) and represents a vital internal factor contributing to operational capability (Jain & Ahuja, 2012). In summary, the synthesis underscores the evolving significance of delivery in production, acknowledging its strategic importance, positive influence on financial performance, and its role as a fundamental element of sustainable competitive advantage and operational capability.

e. Flexibility

Flexibility in manufacturing enterprises is often defined by the rapid response to new customer requests, changes in production volumes and the launch of new products (Sharkie 2003). It is the ability to adjust to a dynamic or unpredictable condition and successfully respond to issues that arise due to change (Beamon, 1999; Theeranuphattana & Tang, 2008). Moreover, Sharkie (2003) describes the need for organizations to develop capabilities for change, which include the processes of agility and flexibility as well as speed and rapid access to knowledge and competence.

According to Bernardes and Hanna (2009), Chan et al. (2017), and Braunscheidel and Suresh (2018), the success of an organization relies on its ability to swiftly generate, capture, and disseminate knowledge. The ability to generate and adapt knowledge continuously is potentially a sustainable competitive advantage (Wu et al., 2012; Lin et al., 2016; Ramanathan et al., 2017).

Empirical research exploring the correlation between flexibility and organizational performance has yielded mixed results. Some studies suggest indeed that process flexibility, delivery reliability, cost leadership, product or process innovation, and product quality are important intermediate performance indicators that affect overall performance positively (North & Kumta, 2018; Inkinen, 2015; Hung et al., 2015) while others have found them to be negatively related (Ferdows et al., 2016; Jain & Ahuja, 2012; Golec & Taskin, 2007; Yurdakul, 2002). The review highlights the complexity involved in the ability to determine a concrete connection linking flexibility to organizational performance, suggesting the need for more research in such areas.

CONCEPTUAL FRAMEWORK

The conceptual framework depicted in Figure 1 is built upon the Dynamic Capabilities Theory, serving as a robust theoretical basis for comprehending and forecasting organizational performance within Malaysian manufacturing enterprises. This framework brings together essential elements about sustainable manufacturing factors, including sustainable innovation, quality, cost management, delivery, and flexibility. These factors are recognized as pivotal components that contribute significantly to organizational performance.

This synthesis highlights the consistency of the theoretical framework with Dynamic Capabilities Theory, providing a comprehensive and theoretically informed lens to explore the factors impacting performance within Malaysia's manufacturing sector. By incorporating sustainable manufacturing elements into this theoretical framework, it lays the foundation for a holistic approach to tackle the complex and multidimensional characteristics of organizational performance in the context of the changing business environment.

Overall, the conceptual framework assists both researchers and practitioners in examining organizational performance in Malaysian manufacturing enterprises. This not only emphasizes the need for factors for sustainable manufacturing but also highlights how the required dynamic capabilities can serve as enablers that will allow organizations to overcome the sustainability challenges and permit the impact of these sustainable manufacturing factors to continue driving capabilities for sustainable competitive advantage as well as long-term success.

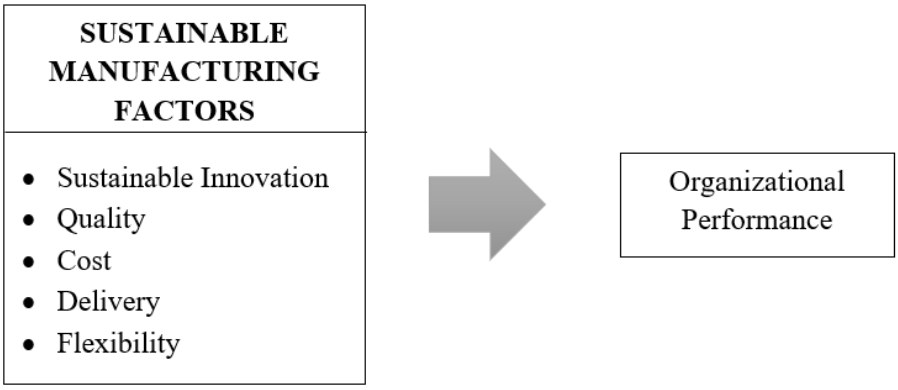

Figure 1. Conceptual Framework

The proposed measurement items with their respective bases have been summarized in Table 1, adapted from Ahuja and Khamba (2008), Vachon and Klassen (2008), Ramayah (2011) and Calik and Bardudeen (2021). The selected measurement items cover fundamental constructs of organizational performance, sustainable innovation, quality, cost, delivery, and flexibility. All variables are measured on a five-point Likert scale from 1 = "strongly disagree" to 5 = "strongly agree."

Table 1. Measurement items and source

Code	Question	Source
Organizational Performance		
OP1	Number of complaints	Ramayah (2011)
OP2	Return on investment	
OP3	Financial performance	
OP4	Sales growth	
OP5	Productivity	
OP6	Customer Satisfaction	
OP7	Employee satisfaction	
Sustainable Innovation		
SI1	Over the past three years, my company has consistently increased expenditure for process innovations that provide environmental and social benefits.	Calik & Bardudeen (2021)
SI2	Over the past three years, my company has improved its manufacturing processes effectively to reduce the use of raw materials.	
SI3	Our manufacturing processes effectively reduce the emission of hazardous substances or waste more than those of our competitors.	
SI4	Over the past three years, my company has actively improved its manufacturing process capability to reuse and remanufacture components.	

SI5	Over the past three years, my company has actively designed and improved our production process to reduce rates of injury, occupational diseases, and work-related fatalities.	
Quality		
Q1	My company has improved manufacturing quality.	
Q2	My company has improved customer order compliance.	
Q3	My company has reduced in total process defects and rejections.	Ahuja & Khamba (2008)
Q4	My company has reduced in total process defects and rejections.	
Cost		
C1	My company has reduced in additional capital investments required.	
C2	My company has reduced operating costs.	Ahuja & Khamba (2008)
C3	My company has reduced energy consumption and overhead expenditure.	
Delivery		
D1	My company has promptness in solving customer complaints.	
D2	My company has ordered fulfillment speed.	Vachon & Klassen (2008)
D3	My company has manufactured throughout time.	
D4	My company has met delivery due time.	
Flexibility		
F1	My company can change the delivery date.	
F2	My company can change output volume.	Vachon & Klassen (2008)
F3	My company can change the product mix.	

CONCLUSION

This research aims to examine the impact of sustainable manufacturing dimensions namely sustainable innovation, quality, cost, delivery, flexibility on organizational performance in manufacturing industry of Malaysia. This study offers a holistic set of measurement tools used to assess the sustainable manufacturing practices adopted within manufacturing enterprises in Malaysia and their influences on organizational performance. While identifying and evaluating these factors, this study makes contributions to shed more light on complex relationships underneath organizational performance. It utilizes Dynamic Capabilities Theory to provide a novel application that explains the vital relationship between these variables and organizational performance, specifically in sustainable manufacturing in Malaysia.

The conceptual framework was introduced in the study, which enhances the knowledge of sustainable manufacturing in Malaysia, representing a steppingstone for future investigations. It is beneficial for policy makers and manufacturing organizations in Malaysia by developing sustainable manufacturing initiatives and overall organizational performance. But the fact that the study is primarily theoretical without involving empirical evidence hinders the extent to which the findings can be generalized in practice, highlighting the call for future research to confirm these variables help to explain organizational performance. Like some of its predecessors, the present study opens the floor for future research in which other antecedents

could be studied as well as to adopt mixed methods approaches to further investigate the relationship between sustainable manufacturing practices and specific measures of organizational performance.

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