

Dynamic Capabilities and Digital Competitiveness: A Sustainability-Focused Research Agenda for ICT Service SMEs in Developing Economies

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Abstract: The rapid advancement of digital technologies has transformed competitive dynamics across industries, particularly among Information and Communication Technology (ICT) service Small and Medium Enterprises (SMEs) in developing economies. To remain competitive amid technological disruption, evolving customer expectations, and sustainability challenges, firms must continuously adapt their resources and capabilities. Drawing on Dynamic Capability Theory (DCT), this paper proposes a conceptual framework that examines the role of dynamic capabilities in enhancing digital competitiveness and organizational sustainability. The study further integrates the Triple Bottom Line (TBL) perspective by conceptualizing sustainability through economic, social, and environmental dimensions. Through a comprehensive review of contemporary literature, the paper argues that dynamic capabilities enable ICT service SMEs to respond effectively to environmental changes, strengthen digital competitiveness, and achieve sustainable competitive advantage. The proposed framework contributes to the literature by extending DCT into the domains of digital competitiveness and organizational sustainability while offering practical insights for SME managers and policymakers seeking to foster resilience, innovation, and long-term growth. The paper concludes by highlighting future research directions for advancing sustainable digital transformation among ICT service SMEs.

Keywords: Dynamic Capabilities, Economic Growth, ICT Service SMEs, Organizational Sustainability, and SDG 8: Decent Work



1. Introduction

The digital economy has emerged as a major driver of economic growth, innovation, and competitiveness in both developed and developing countries. The rapid advancement of digital technologies, including artificial intelligence (AI), cloud computing, big data analytics, Internet of Things (IoT), blockchain, and Industry 4.0 technologies, has significantly transformed how organizations create value, interact with customers, and sustain competitive advantage in increasingly volatile business environments [1][2]. Digital transformation has become a strategic necessity rather than a technological option, requiring organizations to continuously adapt their structures, processes, and capabilities to respond to evolving market conditions and technological disruptions [3]. In this context, Information and Communication Technology (ICT) service Small and Medium Enterprises (SMEs) play a critical role in facilitating digitalization across industries through software development, digital consulting, cloud services, cybersecurity solutions, and technology-enabled business transformation initiatives.

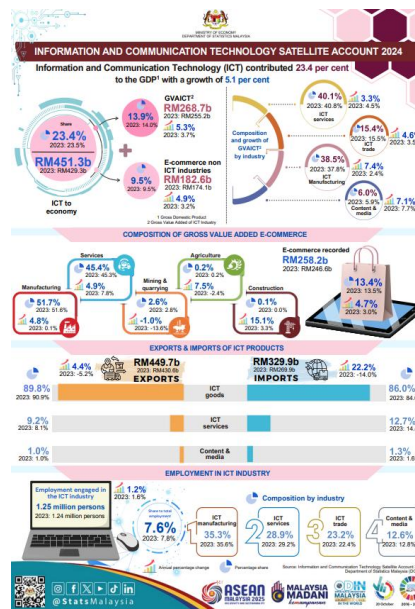


Fig. 1 Economic contribution and industrial composition of the ICT sector in Malaysia for 2024.

Source: Department of Statistics Malaysia (DOSM, 2024).

In Malaysia, SMEs represent the backbone of the national economy, accounting for more than 97% of business establishments and contributing substantially to employment generation, entrepreneurial development, and economic growth. The ICT services sector has emerged as one of the most dynamic segments within Malaysia's digital economy, supporting national digitalization efforts and technological innovation. Fig. 1 shows that according to the Department of Statistics Malaysia (DOSM), the contribution of Information and Communication Technology (ICT) and e-commerce activities to the national economy reached 23.4% of Gross Domestic Product (GDP), equivalent to RM451.3 billion in 2022, reflecting the growing significance of digital economic activities within the country. Furthermore, the Malaysian government has actively promoted digital transformation through initiatives such as the Malaysia Digital Economy Blueprint (MyDIGITAL), which aims to position Malaysia as a regional leader in the digital economy while fostering sustainable and inclusive socioeconomic development.

Despite the growing opportunities created by digital transformation, ICT service SMEs continue to encounter substantial challenges that constrain their long-term competitiveness and sustainability. These challenges include resource limitations, technological uncertainty, cybersecurity risks, rapid market changes, talent shortages, and increasing stakeholder expectations regarding sustainable business practices [3][4]. Unlike large organizations, SMEs often operate with limited financial, technological, and human resources, making it difficult to sustain continuous innovation and technological upgrading. As digital competition intensifies, ICT service SMEs must not only adopt

new technologies but also develop organizational capabilities that enable them to effectively leverage these technologies for long-term value creation and competitive advantage.

Simultaneously, sustainability has become an increasingly important strategic imperative for contemporary organizations. Firms are no longer evaluated solely based on financial performance but are increasingly assessed according to their environmental responsibility, social contribution, and governance practices. Consequently, organizations are expected to balance economic growth with environmental stewardship and social well-being, consistent with the principles of the Triple Bottom Line (TBL) framework. Previous studies have emphasized that sustainable organizational performance requires firms to integrate sustainability considerations into their strategic decision-making processes and innovation activities rather than treating sustainability as a standalone objective [5][6].

Traditional strategic management theories often explain competitive advantage through the possession of valuable and difficult-to-imitate resources. However, rapidly changing digital environments require organizations to continuously renew, reconfigure, and transform their resources and competencies to remain competitive. Dynamic Capability Theory (DCT) provides a suitable theoretical lens for understanding how organizations adapt and sustain performance under conditions of uncertainty. Dynamic capabilities refer to a firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments [1]. These capabilities are generally conceptualized through three interrelated dimensions: sensing opportunities and threats, seizing opportunities through strategic action, and reconfiguring organizational resources to maintain competitiveness over time [1]. Recent studies further suggest that dynamic capabilities facilitate digital transformation through organizational renewal and adaptation processes [2].

The relationship between dynamic capabilities and digital competitiveness has attracted increasing scholarly attention in recent years. Digital competitiveness refers to an organization's ability to effectively utilize digital technologies, digital knowledge, and innovation capabilities to enhance productivity, adaptability, and market performance. Emerging evidence suggests that organizations possessing strong dynamic capabilities are better positioned to develop digital maturity, foster responsible innovation, strengthen organizational agility, and ultimately achieve superior competitive outcomes in the digital economy [7][8][4]. However, existing literature remains fragmented, with most studies examining digital transformation, sustainability, and dynamic capabilities as separate streams of research rather than integrated strategic phenomena.

Furthermore, current research remains predominantly concentrated within manufacturing sectors and developed economies, while relatively limited attention has been devoted to ICT service SMEs operating in developing countries such as Malaysia. Given the strategic importance of ICT service SMEs in driving digital transformation and national competitiveness, there is a pressing need to examine how dynamic capabilities contribute to both digital competitiveness and organizational sustainability within this context. The unique characteristics of ICT service SMEs, including their knowledge-intensive nature, technological dependence, and exposure to rapid innovation cycles, suggest that dynamic capabilities may play a particularly important role in determining sustainable competitive outcomes.

Therefore, this study aims to develop a sustainability-focused research agenda that explains how dynamic capabilities influence digital competitiveness and organizational sustainability among ICT service SMEs in developing economies. Drawing upon Dynamic Capability Theory and the Triple Bottom Line perspective, the study proposes a comprehensive conceptual framework that integrates sensing, seizing, and reconfiguring capabilities with digital competitiveness and sustainability outcomes. By doing so, this study contributes to the growing literature on strategic management, digital transformation, and sustainability while providing practical insights for SME managers and policymakers seeking to enhance resilience, innovation, and long-term competitiveness in the digital era.

2. Literature Review

A. Organizational Sustainability

Organizational sustainability refers to the ability of firms to achieve long-term success while balancing economic, environmental, and social objectives. The Triple Bottom Line (TBL) framework remains the dominant perspective for conceptualizing organizational sustainability, emphasizing economic prosperity, environmental stewardship, and social responsibility as interconnected dimensions of sustainable performance [5].

Economic sustainability focuses on profitability, productivity, and long-term financial viability. Social sustainability encompasses employee welfare, stakeholder engagement, community development, and ethical business practices. Environmental sustainability involves responsible resource utilization, waste reduction, and environmentally conscious business operations. Contemporary sustainability research increasingly emphasizes the integration of these dimensions into organizational strategy rather than treating them as separate objectives [6].

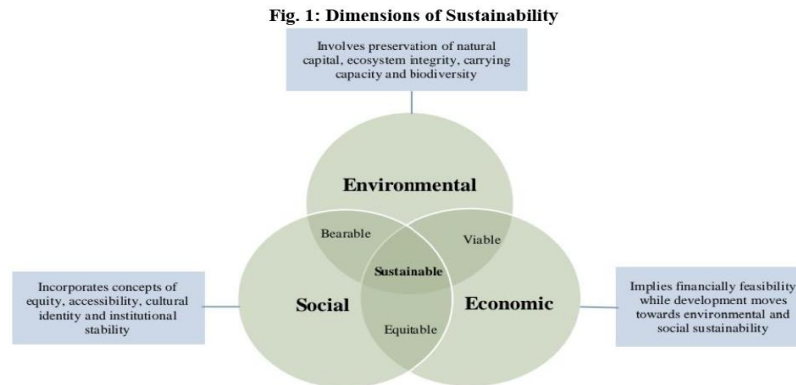


Fig. 2 Dimensions of Sustainability

Sources: Bom, Jorge, Ribeiro, & Marto (2019)

In digitally intensive industries such as ICT services, sustainability is becoming increasingly important due to growing stakeholder expectations regarding ethical technology use, digital inclusion, environmental responsibility, and corporate governance. Consequently, ICT service SMEs are required to pursue sustainability objectives alongside digital transformation initiatives to remain competitive and socially responsible. Fig. 2 above shows a way to measure the environmental, social, and economic dimensions of sustainability.

B. Digital Competitiveness

Digital competitiveness has become a critical determinant of organizational success in increasingly digitalized economies. It refers to an organization's ability to leverage digital technologies, digital knowledge, and innovation capabilities to improve productivity, enhance customer value, and sustain market competitiveness. Unlike traditional competitiveness, digital competitiveness emphasizes the effective integration of digital technologies into organizational processes, business models, and strategic decision-making [8].

Recent literature suggests that digital competitiveness extends beyond technology adoption and encompasses organizational readiness, digital culture, innovation orientation, and technological adaptability. Alrub and Sánchez-Cañizares [8] argue that digital competitiveness is significantly influenced by an organization's digital maturity, which reflects its ability to effectively integrate digital technologies into strategic and operational activities. Similarly, Bodendorf and Franke [9] emphasize that technological transformation requires organizations to continuously develop adaptive capabilities that facilitate technological integration and organizational renewal.

In the context of ICT service SMEs, digital competitiveness is particularly important because these firms operate within highly dynamic digital ecosystems characterized by rapid innovation cycles and intense competition. Digital competitiveness enables ICT service SMEs to improve service quality, accelerate innovation, strengthen customer relationships, and respond effectively to technological disruption. As such, digital competitiveness represents an important strategic outcome of dynamic capability development.

C. Dynamic Capabilities and Digital Competitiveness

The relationship between dynamic capabilities and digital competitiveness has received increasing scholarly attention due to the growing importance of digital transformation. Dynamic capabilities provide the organizational mechanisms through which firms can develop and sustain digital competitiveness. Specifically, sensing capability enables firms to identify technological opportunities and anticipate digital trends, while seizing capability facilitates strategic investment in digital technologies and innovation initiatives. Reconfiguring capability allows organizations to continuously adapt their structures and processes to maximize the benefits of digital transformation [2], [9].

Several studies provide empirical evidence supporting the positive relationship between dynamic capabilities and digital competitiveness. De la Torre and De la Vega [7] found that dynamic capabilities significantly enhance digital innovation and competitive performance through responsible innovation practices. Similarly, Elmouhib and Idrissi [8] demonstrated that dynamic capabilities improve organizational agility, which subsequently enhances innovation performance and competitiveness in digitally transformed environments.

Recent studies further highlight the importance of digital leadership and organizational culture in strengthening the relationship between dynamic capabilities and digital competitiveness. Wang et al. [10] found that employee dynamic capabilities significantly contribute to digital performance, while Held et al. [11] demonstrated that dynamic capabilities facilitate the development of digital leadership and digital culture among SMEs. These findings suggest that dynamic capabilities function as strategic enablers that allow organizations to translate technological investments into sustainable competitive outcomes.

D. Dynamic Capability Theory

Dynamic Capability Theory (DCT) has emerged as one of the most influential theoretical perspectives for explaining how organizations achieve and sustain competitive advantage in highly dynamic and uncertain business environments. Developed as an extension of the Resource-Based View (RBV), DCT argues that competitive advantage is not solely derived from the possession of valuable resources but from an organization's ability to continuously integrate, build, and reconfigure these resources in response to environmental change [12]. According to Teece [1], dynamic capabilities represent higher-order capabilities that enable firms to sense environmental opportunities and threats, seize emerging opportunities through strategic action, and reconfigure organizational resources to sustain competitiveness over time.

The relevance of DCT has increased significantly in the digital era, where rapid technological advancements continuously reshape industry structures, customer expectations, and competitive dynamics. Organizations are increasingly required to adapt to digital disruption, emerging technologies, and evolving stakeholder demands. Consequently, dynamic capabilities have become essential for facilitating organizational agility, innovation, and strategic renewal [2]. Recent studies suggest that firms possessing stronger dynamic capabilities demonstrate superior performance in digital transformation initiatives because they are better equipped to align technological investments with strategic objectives and market requirements [8], [11].

Among the various conceptualizations of dynamic capabilities, Teece's framework comprising sensing, seizing, and reconfiguring capabilities remains the most widely accepted. Sensing capability enables firms to identify emerging technological trends, market opportunities, and environmental changes. Seizing capability refers to the organization's ability to mobilize resources and implement strategic actions to capitalize on identified opportunities. Reconfiguring capability facilitates the continuous transformation of organizational resources, structures, and processes to maintain competitiveness under changing conditions [1]. These dimensions collectively provide a robust theoretical foundation for understanding how ICT service SMEs navigate digital transformation and sustain competitive advantage.

E. Organizational Sustainability, Dynamic Capabilities, and Digital Competitiveness

Recent literature suggests that dynamic capabilities contribute to organizational sustainability by enabling firms to adapt to changing environmental conditions and align strategic objectives with sustainability requirements.

Organizations possessing strong dynamic capabilities are better able to identify sustainability opportunities, implement environmentally responsible innovations, and continuously improve organizational performance [5].

Furthermore, digital competitiveness may function as an important mechanism through which dynamic capabilities influence sustainability outcomes. Firms with higher levels of digital competitiveness can leverage digital technologies to improve resource efficiency, optimize operational processes, strengthen stakeholder engagement, and support sustainable innovation. Consequently, digital competitiveness may serve as a mediating factor linking dynamic capabilities and organizational sustainability. The implementation of Industry 4.0 can provide SMEs with opportunities to improve their ability to respond to changes in the business environment and strengthen their long-term sustainability. However, the benefits of digital technologies may depend on how effectively firms align technology adoption with their existing organisational capabilities and business strategies [18].

Based on the preceding discussion, this study proposes that dynamic capabilities positively influence digital competitiveness and organizational sustainability among ICT service SMEs operating in developing economies.

3. Methodology

This study adopted a quantitative cross-sectional research design to examine the relationships between dynamic capabilities, digital competitiveness, and organizational sustainability among ICT service SMEs in Malaysia. The target population comprised SME owners, founders, chief executive officers, managing directors, and senior managers who were actively involved in strategic decision-making processes within their organizations.

Data were collected using a structured questionnaire adapted from previously validated measurement instruments. Dynamic capabilities were operationalized as a higher-order construct consisting of sensing, seizing, and reconfiguring capabilities based on the Dynamic Capability Theory framework. Digital competitiveness was measured through dimensions reflecting digital readiness, digital innovation, technological adaptability, and digital performance. Organizational sustainability was operationalized using the Triple Bottom Line (TBL) framework, encompassing economic, social, and environmental sustainability dimensions in line with contemporary sustainability research.

All constructs were measured using a five-point Likert scale ranging from “Strongly Disagree” to “Strongly Agree.” The sampling frame was obtained from the databases of SME Corporation Malaysia and the Malaysia Digital Economy Corporation (MDEC), ensuring adequate representation of ICT service SMEs across Malaysia.

4. Data Analysis And Discussion

A. Sample Description

The study gathered 50 usable responses from managers working within Malaysian ICT SME service firms as indicated in Table I. An examination of their profiles reveals that most participants hold senior leadership positions. Specifically, Managing Directors constitute 58% (29 respondents), General Managers account for 36% (18 respondents), and Chief Executive Officers represent 16% (8 respondents). This composition indicates that the sample is largely made up of individuals with substantial decision-making authority, who are directly engaged in shaping organizational strategies and overseeing operations, including matters related to Industry 4.0 adoption.

TABLE I
Characteristics of The Companies Studied

Category	Item Description	Frequency	Percentage (%)
Managerial Position	Managing Director	29	58
	General Manager	18	36
	Chief Executive Officer	8	16

Type of Service Provided	Software and System Design	38	76
	Data Management	12	24
Type of organization	Micro enterprise	8	16
	Small Enterprise	26	52
	Medium Enterprise	16	32

Below shows descriptive analysis for sensing, seizing and reconfiguring to represent dynamic capabilities construct as well as business sustainability.

TABLE II
Descriptive Analysis (Sensing Capabilities)

Rank	Code	M	SD	Md
SEN1	Our company determines customer needs with high precision through strategic environmental analysis.	4.280	0.701	4.00
SEN2	Our company systematically searches for information about the current market situation.	4.040	0.533	4.00
SEN5	Our company involves customers/suppliers in product or service development.	4.000	0.857	4.00
SEN3	Our company closely monitors competitors' activities.	3.760	0.591	4.00
SEN4	Our company focuses on an integrated analysis of new technologies in the industry.	3.760	0.744	4.00
SEN6	Our company assesses potential environmental impacts of products, processes and services.	3.540	0.676	4.00
SEN7	Our company networks with public organizations, industrial associations and universities.	2.620	1.048	2.50

Note. M = Mean; SD = Standard Deviation; Md = Median; n = 50.

The overall mean score of Sensing capability shows in Table II, (M = 3.71) indicates that ICT SMEs generally demonstrate a relatively high capability to identify market opportunities and environmental changes. The highest-rated practice was determining customer needs through strategic environmental analysis (SEN1; M = 4.28, SD = 0.70), while networking with public organizations, industrial associations and universities (SEN7; M = 2.62, SD = 1.05) received the lowest rating, suggesting weaker external collaboration activities.

TABLE III
Descriptive Analysis (Seizing Capabilities)

Rank	Code	M	SD	Md
SEI6	Our company effectively utilizes existing knowledge in developing new products and services.	4.280	0.671	4.00
SEI2	Our company encourages cooperation and integration among organizational units.	4.040	0.807	4.00
SEI3	Our company quickly accesses new information from external opinions and analyses.	3.740	0.633	4.00
SEI5	Our company emphasizes working with strategic partners.	3.540	0.706	4.00

SEI4	Our company transforms technological knowledge into product and process innovation.	3.500	0.886	4.00
SEI1	Our company redesigns its business model in line with potential opportunities.	3.420	0.731	3.00
SEI7	Our company mobilizes financial and non-financial resources effectively.	2.920	0.778	3.00

Note. *M* = Mean; *SD* = Standard Deviation; *Md* = Median; *n* = 50.

According to Table III, the overall mean for Seizing capability was 3.63, indicating that respondents generally agreed that their organizations effectively capitalize on identified business opportunities. The highest-rated activity was business model redesign to exploit new opportunities (*M* = 3.72), whereas collaboration with strategic partners (*M* = 3.54) received the lowest rating, suggesting room for improving inter-organizational collaboration.

TABLE IV
Descriptive Analysis (Reconfiguring Capabilities)

Rank	Code	M	SD	Md
REC1	Our company conducts special training for employees.	4.260	0.63 3	4.00
REC7	Our company reconfigures tangible and intangible assets.	3.920	0.87 7	4.00
REC5	Our company adapts its plans flexibly according to current situations.	3.720	0.64 0	4.00
REC2	Our organizational structure can be modified according to adaptive strategies.	3.660	0.98 2	4.00
REC6	Our company adopts new business practices to enhance operations.	3.640	0.69 3	4.00
REC3	Our company plans to purchase new equipment periodically.	2.860	0.92 6	3.00
REC4	Our company invests in purchasing new equipment.	2.720	0.94 8	3.00

Note. *M* = Mean; *SD* = Standard Deviation; *Md* = Median; *n* = 50.

The overall Reconfiguring capability recorded a mean of 3.54 as shown in Table IV, the lowest among the three dynamic capability dimensions. The highest score was obtained for employee training (*M* = 3.74), reflecting organizations' commitment to developing workforce competencies. In contrast, investment in new equipment (*M* = 3.38) received the lowest mean, indicating that financial investment in organizational transformation remains relatively limited.

TABLE V
Descriptive Analysis (Organizational Sustainability)

Rank	Code	M	SD	Md
OS2	Better customer feedback regarding service quality.	4.520	0.61 4	5.00
OS12	Compliance with environmental laws and regulations.	4.420	0.70 2	5.00
OS1	Greater agility in customer service.	4.320	0.58 7	4.00

OS4	Enhanced working conditions.	4.280	0.64 0	4.00
OS3	Improved productivity and quality of work life.	4.260	0.56 5	4.00
OS8	Increased efficiency and better service performance.	4.100	0.61 4	4.00
OS11	Reduced environmental emissions.	3.900	0.61 4	4.00
OS7	Significant improvement in service quality.	3.860	0.75 6	4.00
OS5	Greater competitive advantage through IR4.0 adoption.	3.820	0.72 0	4.00
OS6	More personalized and flexible service delivery.	3.660	0.77 2	4.00
OS9	Reduced material waste.	3.600	1.08 8	4.00
OS10	Minimized overall waste generation.	3.580	0.67 3	4.00

Note. *M* = Mean; *SD* = Standard Deviation; *Md* = Median; *n* = 50.

According to Table V, the overall mean score of Organizational Sustainability ($M = 4.03$) indicates a high level of sustainability performance among the surveyed ICT SMEs. The highest-rated item was receiving better customer feedback regarding service quality (OS2; $M = 4.52$, $SD = 0.61$), followed by compliance with environmental laws and regulations (OS12; $M = 4.42$, $SD = 0.70$). The lowest-rated items were minimizing overall waste generation (OS10; $M = 3.58$, $SD = 0.67$) and reducing material waste (OS9; $M = 3.60$, $SD = 1.09$), indicating that environmental sustainability practices lag behind customer- and service-related sustainability outcomes.

5. Conclusion And Recommendations

This study contributed to the strategic management, digital transformation, and sustainability literature by empirically demonstrating the significant role of dynamic capabilities in enhancing digital competitiveness and organizational sustainability among ICT service SMEs in Malaysia. By illustrating how sensing, seizing, and reconfiguring capabilities strengthen digital competitiveness and subsequently improve sustainability performance, the findings expanded the application of Dynamic Capability Theory within the context of digitally enabled and sustainability-oriented SMEs.

The study further contributed to existing knowledge by integrating dynamic capabilities, digital competitiveness, and organizational sustainability into a comprehensive research framework. The findings highlighted that ICT service SMEs seeking long-term competitiveness and sustainable growth should prioritize investments in organizational capability development, digital innovation, and continuous resource reconfiguration.

From a practical standpoint, SME leaders should focus on strengthening strategic sensing mechanisms, enhancing digital readiness, and fostering innovation-oriented organizational cultures to improve digital competitiveness and sustainability performance. Policymakers and SME support agencies may utilize these insights to design targeted interventions, including digital transformation programs, innovation ecosystems, capability-building initiatives, and technological readiness support mechanisms that facilitate sustainable SME development. Ultimately, for ICT SMEs to continue reducing income inequalities and driving national development, a comprehensive strategy is required. This strategy must move beyond mere technological acquisition to focus on talent

development and strategic alignment, ensuring that the transition to a digital economy fosters a resilient, inclusive, and highly skilled labor market in line with the objectives of SDG 8.

Future research may employ longitudinal designs and cross-country comparative studies to further examine the dynamic relationships between digital capabilities, competitiveness, and sustainability over time. Such approaches would provide deeper insights into the evolving role of digital transformation in supporting sustainable organizational performance across diverse economic and institutional contexts.

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