



The impact of digital transformation on the performance of small and medium-sized enterprises: The mediating role of innovation capabilities in emerging markets

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Alshbiel, R. O. (2026). The impact of digital transformation on the performance of small and medium-sized enterprises: The mediating role of innovation capabilities in emerging markets. *Horizons Intermediary Journal of Business Research*, 1(1), 18–32.

Article History:

Received: 2026-01-18

Revised: 2026-02-01

Accepted: 2026-03-01

Published: 2026-03-04

JEL classification: M10, O30.

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Abstract

Digital transformation has become a strategic priority for small and medium-sized enterprises (SMEs), particularly in emerging markets, where companies face intense competition and limited resources. Although interest in this topic continues to grow, there is limited empirical evidence on how digital transformation impacts SME performance. Using the Resource-Based View and the Dynamic Capabilities perspective, this paper explores the effects of digital transformation on SME performance and examines the mediating role of innovation capabilities. Data was collected through a structured questionnaire from 269 SMEs operating in Malaysia. Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to test the proposed research model. The results show that digital transformation has a positive and significant direct effect on SME performance, and innovation capabilities also have a strong positive impact. Furthermore, innovation capabilities significantly influence SME performance and partly mediate the relationship between digital transformation and performance. These findings suggest that digital technologies lead to better performance when SMEs simultaneously develop innovation-driven capabilities that support knowledge sharing, process adaptation, and continuous improvement. This research contributes to the literature by providing empirical data from an emerging-market context and clarifying the capability-based processes underlying digital transformation. Practical recommendations for SME managers and policymakers emphasize aligning digital efforts with the development of innovation capabilities to achieve sustainable performance benefits.

Keywords: Digital Transformation, Performance, SME, Innovation Capabilities, Emerging Markets.

I. Introduction

Modern small- and medium-sized businesses undergo a near-radical digital transformation (DT), which has proven decisive in shaping the operating environment of established corporations (Huang, 2024). Since technologies are defined by systematized capabilities that facilitate primary business processes, they can empower firms to enhance customer experiences and accelerate growth (Okeke et al., 2024). For small- and medium-sized businesses, digital progress can be exploited to the greatest extent to achieve essential, sustainable goals (Bhuiyan et al., 2024). This is readily acquired, especially in the digital era, where digital tools are increasingly prevalent, including cloud computing, big data analytics, social media, and e-commerce platforms (Martinez-Pelez et al., 2023).

Through the above, it can be seen that DT has an impact on enterprise performance (Escos Barragan et al., 2025). This is the reason why stakeholders and leaders are embracing radical approaches that incorporate technologies that have the capacity to minimize costs and facilitate decision-making (Seppanen, 2025). The apparent effect also differs in settings and is determined by the organizational preparedness, industry peculiarities, and environmental conditions (Jewapatarakul and Ueasangkomsate, 2024). The significance of innovation capabilities (IC) is a well-known fact; the capability can be defined as the capacity of the firm to develop products, services, and processes (HOANG et al., 2025). It is an important medium through which digital knowledge can be translated into physical action (Sharabati et al., 2025).

This paper analyzes one of the most significant changes in the modern management research: how DT can be translated into a technological orientation into tangible organizational processes that produce performance outcomes. In particular, it propagates the thesis that IC are the key mechanism by which DT affects SME performance (SMEP). Instead of considering digital tools as performance-enhancing in nature, the study makes the innovative capacity of firms the central driver that directs digital investments towards experimentation, business model renewal, and the development of a culture based on continuous improvement.

Through empirical evidence of the mediating effect of IC, the study indicates that the innovative capability of SMEs defines whether digital technologies are adopted or used as a strategic resource. By understanding that IC serve as the channel through which DT and performance are connected,

managers can be in a better position to align investments in digital infrastructure with the creation of complementary organizational competencies. Enhancing innovation potential allows SMEs to overcome the long-standing obstacles to the use of technology, such as the lack of resources, skills, and organizational culture to change. In this respect, the research provides a systematic insight into the ways in which digital and innovation strategies may be combined to deliver sustainable gains in performance.

The main aim of the study is to establish the best channels by which the DT supports business performance among SMEs. It explains the importance of IC as a mediating factor and the importance of creating dynamic and unique value position to maximize the opportunities of digitalization. In this way, the study will have a theoretical and practical contribution to the firms that want to perfect the innovation-oriented strategies and policy initiatives to enhance performance outcomes.

The topicality of this study is justified by the fact that it addresses a significant gap in the literature. Although the existing literature has mostly recognized the positive linkage between digitalization and organizational performance, it has tended to ignore the diversity of organizational environments and the inner workings that precondition performance impacts. Specifically, little empirical research has been done on the mediating variables that describe how DT is converted into quantifiable results in SMEs. The inability of many firms to achieve performance benefits through digital initiatives is exactly due to the lack of IC needed to absorb, adapt and exploit new technologies.

In this regard, the research question that will be answered in this study is as follows: What is the role of IC in mediating the relationship between DT and SMEP? In answering this question, the research offers a more subtle insight into the role of such dimensions as technological agility, product development capacity, and process improvement capabilities in improving the effectiveness of digital initiatives. Finally, the research will add to the further elaboration of how SMEs will be able to turn digital investments into sustainable competitive advantages by strategically building innovation-focused capabilities.

2. Literature Review

The digital tools employed by small and medium-sized enterprises (SMEs) streamline the internal operations and

allow responding quickly to the ever-evolving market demands (Kallmuenzer et al., 2025). The benefits that cloud computing platforms, e-commerce and customer relationship management systems bring to these firms include access to wider markets and more sources of revenue. This result shows that there is a positive correlation between SMEP and DT (Le et al., 2024). One of the studies examined how technological integration contributes to the internationalization process of SMEs and how it promotes exports (Chopra et al., 2024). On the same note, in another study, it was established that information and communication technology use is linked to higher SME market share and, therefore, directly influences sales and profits (Wu, 2024).

DT happens when the capabilities of organizational innovations can be considered powerful catalysts (Hu et al., 2024). They tend to be portrayed as key bridges that accommodate digital change and can enable performance to be achieved (Lu et al., 2024). It seems that the more the product, process, and technical innovation, the stronger the capabilities of SMEs in the context of utilizing digital resources and gaining a competitive edge (Otache, 2024). They have also entailed SME business models, which generate value and therefore convert digital investments into physical returns (Ferreira et al., 2024).

Nevertheless, the available information on the mediating effect of innovative capabilities is incomplete and, to an extent, situational (Alshaher et al., 2025). Other studies do not articulate the connection between the use of technology and small and medium-sized enterprises (SMEs), and do not give much empirical attention to new markets (Bilal et al., 2025). Consequently, contextual elements, including infrastructure, regulation, and resource endowments, seem to influence the results that are linked to IC (Hussain et al., 2025). Simultaneously, the advantages of DT have been reported in most studies. Nevertheless, they have concentrated on particular technological applications and generic performance measures and ignored the processes and Organisational capabilities underlying the stated relationship (Wang and Sun, 2025).

These omissions, in turn, have weakened the existing research (Secka & Szopik, 2024). At first glance, part of the research adopts a rather deterministic approach, focusing on the direct impact of the DT on performance while ignoring the ideational role of internal Organisational capabilities, particularly those related to innovation (Balboa et al., 2024). In general, such studies do not offer comprehensive models

that integrate the disparate constructs, and the processes underlying the digital-performance nexus remain underexplored.

Further research has mainly aimed to analyze the DT in developed economies, including the United States, Europe, and South Korea; however, special attention should also be given to the firms that belong to the category of small and medium-sized enterprises (SMEs) located in the emerging economies (Zaki et al., 2025). As it is understood, there have been socioeconomic and infrastructural differences between the developed financial systems and the emergent entrepreneurial markets, thus forcing a strict analysis of the businesses that transpire within such environments; specifically, the small scope of digital abilities, the high cost of investments, and regulatory challenges can interfere with the swift implementation of digital technologies and, therefore, delay technological activities and performance (Lahon and Chimpi, 2024).

Moreover, there is a lack of longitudinal research on the sustainability and scalability of digital initiatives. The majority of academic literature has captured only short-term impacts, failing to provide an in-depth examination of the implications of IC for long-term performance. It is of paramount importance to understand how innovation has contributed to the long-term performance of SMEs, as it enhances Organisational competitiveness and supports long-term survival in a constantly changing environment (Al Shbail et al., 2025; Haloush et al., 2021).

3. Theoretical Framework

This paper is based on the Resource-Based View (RBV) and Dynamic Capabilities (DC) models that offer strong explanations of how DT impacts the performance of small and medium-sized enterprises (SMEs). The RBV worldview implies that digital technologies, such as cloud platforms, analytics, and AI-enabled tools, among others, are viewed as valuable, rare, and hard to copy, which also leads to the role of SMEs in the world of competition (Willie, 2025; Kaur and Kumar, 2024). It has been demonstrated through empirical studies that the more successful companies are in their acquisition and utilization of such digital resources, the more successful they are in their operations, decision-making, and market responsiveness (Aghazadeh et al., 2024). With digital tools changing the organizational routine, they assist SMEs to increase productivity and simplify the internal processes, allowing measuring the improvement of performance both in fiscal and non-

financial aspects (Deku et al., 2024; Sharabati et al., 2024). Nevertheless, RBV also suggests that the benefits of DT can be maximized only under the condition when the internal resources (in the form of knowledge assets and innovation competencies) are available, which can help organizations transform the technological investments into strategic deliverables (Sipos et al., 2025; Bhuiyan et al., 2024).

The DC framework, which is the complement to RBV, is concerned with the capability of firms to identify opportunities, take up technology, and re-engineer the internal capabilities in accordance with the dynamism of the environment (Mele et al., 2024; Held et al., 2025). The specified perspective is especially relevant to SMEs that work in the emerging markets, where the lack of resources, infrastructure, and uncertainty of the market make adaptability a key to success (Lahon and Chimpi, 2024; Zaki et al., 2025). DT assists in building DC through the creation of absorptive capacity and the ability of companies to integrate digital knowledge in the innovation (Hashem and Aboelimged, 2024; Kastelli et al., 2024). Studies show that SMEs that are highly innovative, such as those that develop products fast, are flexible in their processes, and experiment with technologies, are in a better place to turn digital investments into competitive advantages and better performance (Al Nuaimi et al., 2024; Otache, 2024; Bilal et al., 2025). In such a way, the capabilities of innovation are not only performance-enhancing mechanisms but also mediators that help to translate DT into value in the organization (Arroyabe et al., 2024; Escoz Barragan et al., 2025; Sherani et al., 2025). This produced RBV-DC lens offers a comprehensive theoretical perspective of how IC mediate the relationship between DT and performance.

3.1 Hypotheses Development

3.1.1 Digital Transformation on performance in the emerging markets

Digital transformation (DT) is a set of resources that supports a corporation's competitive advantage (Deku et al., 2024). Digital tools, such as data analytics and software solutions, are considered strategic resources that small and medium-sized enterprises (SMEs) can leverage to improve operational efficiency (Omowole et al., 2024).

This observation implies that internal attributes of SMEs are the primary drivers of business performance (Owoade and Oladimeji, 2024). These are the dynamics on which the RBV theory is grounded (Willie, 2025). In the RBV, technological capabilities and organizational structures are

unique strengths that create distinctive standards that competitors struggle to imitate (Sipos et al., 2025). The theory also assumes that successful resource growth and defense within a company facilitate SME management in achieving long-term success and distinction (Kaur and Kumar, 2024). Furthermore, digitalization and process upgrades enhance employees' digital competencies, thereby improving operational productivity.

Another theoretical approach that yields similar implications is the Theory of DC, which provides a conceptual framework for explaining the mechanisms of adaptation and reconfiguration in SMEs (Mele et al., 2024). This theory emphasizes SMEs' ability to identify and understand opportunities and threats, leverage technological innovation, and redefine inherent capabilities to gain a competitive advantage (Held et al., 2025).

The theory further posits that SME departments must continually adapt to technological change to enhance performance measures, including profitability and customer satisfaction (Saputra et al., 2024). This hypothesizes that:

H1: Digital transformation positively influences SMEs' performance in the emerging markets

3.1.2 Digital Transformation Positively Influences SMEs' Innovation Capabilities

DT is a fast process that leads to innovation by using information channels, collaboration tools, and data-driven insights (Arroyabe et al., 2024). In the RBV, the stimuli that drive innovative potential and mediate the digital adoption in an interactive manner are being enabled by new technologies (Hongyun et al., 2025). This tendency has also been discussed in the DC model, according to which the opportunities of digitalization only strengthen the work of SMEs and, at the same time, their absorptive capacity and the efficiency of knowledge (Aghazadeh et al., 2024). Thus, the hypothesis was the following:

H2: Digital transformation positively influences SMEs' innovation capabilities

3.1.3 Innovation capabilities positively influence SMEs' performance

The ability of small and medium-sized businesses to be innovative defines their value proposal and allows them to adjust their organizational framework to suit the ever-evolving customer demands (Al Nuaimi et al., 2024). RBV and DC describe the IC in terms of SME resources, which

enhances operational performance and leads to strategic growth (Ogrea, 2025). This hypothesis posits that:

H3: Innovation capabilities positively influence SMEs' performance

3.I.4 Innovation capabilities mediate the relationship between digital transformation and SMEs' performance

The use of technology depends on IC (Sherani et al., 2025). It is stated that digital tools do not always enhance performance unless the SMEs use the full capabilities of their resources by building IC (Kastelli et al., 2024). Both the RBV and the DC theory demonstrate that IC are important processes that empower SMEs, allowing them to correctly interpret digital signals and thereby maximize organizational performance (Hashem and Aboelmaged, 2024). This hypothesis posits that:

H4: Innovation capabilities mediate the relationship between digital transformation and SMEs' performance

3.2 Conceptual Model

The conceptual model integrates the RBV and the DC model to argue about the contribution of DT to the performance of small and medium-sized enterprises (SMEs) in emerging markets. DT is described as a strategic organizational factor that enhances the efficiency of operations, sensitivity of firms to market forces, and their competitiveness (Aghazadeh et al., 2024; Bhuiyan et al., 2024). However, the literature suggests that the performance outcomes of digital initiatives are not predetermined, but they are predetermined by the internal capacity of SMEs to obtain, comprehend, and efficiently utilize technological improvements (Hashem and Aboelmaged, 2024; Kastelli et al., 2024). The IC, i.e. the ability of firms to create new products, redesign processes and use technological knowledge are then put into the model as an intervening mechanism by which digital resources are translated into performance gains (Al Nuaimi et al., 2024; Otache, 2024). This theoretical rationale aligns with the DC theory that emphasizes the importance of perceiving technological opportunities, acquiring digital knowledge, and altering organizational routines to acquire a competitive edge (Mele et al., 2024; Held et al., 2025). Based on this, the model anticipates that the DT will have positive effects on SMEP, both direct and indirect, which will contribute to the potential of innovation and enable the firms to transform their strategies and operations with the help of digital investments. This combined framework provides a

detailed explanation of the channels through which DT influences the performance of SMEs in an emerging market setting.

4. Methodology

4.I Research Design

The research design adopted in this study is quantitative in nature, enabling a rigorous examination of the hypothesized relationships among DT, IC, and SMEP. A quantitative approach is particularly appropriate for theory-driven research that seeks to test clearly specified hypotheses and assess mediation effects within a structured conceptual framework. Grounded in the RBV and DC perspectives, the study employs statistical modeling techniques to estimate causal relationships and empirically validate the proposed theoretical linkages. This design facilitates a robust assessment of both the direct effect of DT on performance and the indirect effect transmitted through IC, particularly within the complex and heterogeneous conditions characterizing emerging markets.

Primary data were collected using a structured survey instrument, which is well suited for examining organizational constructs that are perceptual, multidimensional, and embedded in managerial practices. The questionnaire enabled the collection of standardized responses from a relatively large sample, thereby enhancing statistical power and ensuring comparability across observations. Measurement items were adapted from established and empirically validated scales to ensure content validity and conceptual consistency. All constructs were operationalized as reflective multi-item measures and assessed using a five-point Likert scale. The use of multi-item indicators strengthens reliability and construct validity, which are essential for structural equation modeling and hypothesis testing in contemporary research on SME digitalization.

4.2 Research Population and Sample

The study population comprised small and medium-sized enterprises (SMEs) in Malaysia, given the country's rapid acceleration in DT programs, government support for the industry, and the enterprises' status as key players in the Malaysian economy. Purposive sampling was used to recruit SME owners and managers with firsthand experience in DT practices, IC, and organizational performance. Such a methodological approach is justified in the literature of entrepreneurship and innovation management (Saunders et al., 2019; Creswell and Creswell, 2017). A total of 340

questionnaires were sent; 269 were considered valid for statistical analysis, yielding a response rate of 74.72%, which is a good engagement level and meets the required minimum threshold for structural model analysis in management research (Hair et al., 2014). The sample size is appropriate for small and medium-sized enterprises. It increases the reliability and generalizability of the findings in the context of emerging markets, consistent with other studies conducted in the same economic setting (Kraus et al., 2022; Rialti et al., 2019).

5. Results

5.1 Descriptive Analysis

5.1.1 Descriptive Statistics for Variables

Table 1 shows the descriptive statistics of the main variables of the study DT, IC, and SMEP, using 340 valid responses. In general, the DT ($M = 2.966$) and IC ($M = 2.994$) of Malaysian SMEs are moderately mean, and the performance of the SMEs is slightly lower but moderately mean ($M = 2.872$). These findings suggest that, although digital technologies and innovations related practices are available in the sampled companies, the scope of further development is still high, especially in the translation of digital activities into better organizational performance. These trends are consistent with the existing literature on SMEs in emerging markets, which emphasizes the gradual and asymmetric nature of the adoption of DT, which is caused by the lack of resources and the absence of capabilities (Vial, 2019; Kraus et al., 2022).

All constructs have a standard deviation of between 0.62 and 0.69, which means that there is low variability in the perceptions of the respondents. It means that the sampled SMEs share common experiences in terms of DT and innovation activities, which facilitates the further multivariate analysis (Hair et al., 2014). Moreover, the value of skewness and kurtosis are within the range of acceptable normality. In particular, the values of skewness are close to zero in all variables, which means that the distributions are almost symmetric, and the values of kurtosis are much below the critical cutoff of ± 3 , which means that the distributions are not strongly non-normal (Kline, 2016). These results substantiate the premises of structural equation modeling and inferential statistics, which gives the research a solid foundation to examine the hypothesized relations between DT, IC, and SMEP.

Table 1: Descriptive Statistics for Study Variables

	N	Mean	SD	Skewness	Kurtosis
DT	340	2.966	0.6350	-0.044	-0.049
IC	340	2.994	0.6925	0.039	0.305
SMEP	340	2.872	0.6211	0.3	1.894

5.1.2 Demographic Profile

Table 2 presents the demographic features of the sampled SMEs and respondents, providing valuable contextual information on the sample structure. In terms of distribution in the business sector, most firms are in the services sector (43.8%), then trade (27.4%) and manufacturing (17.1%), with technology-focused firms making a smaller percentage (11.8). This sectoral structure indicates the predominant position of service-based SMEs in emerging markets such as Malaysia, where digital technologies are increasingly used to facilitate customer engagement, optimize service delivery, and increase operational efficiency, rather than to produce technologies (Kallmuenzer et al., 2025; Le et al., 2024). The heterogeneity of sectors enhances the study's external validity, as it encompasses diverse DT practices and performance outcomes across different business contexts.

Table 2: Demographic Characteristics of the Respondents and Firms

	Answers	Frequency	Percent	Cumulative Percent
Business Sector	Services	149	43.8	43.8
	Trade	93	27.4	71.2
	Manufacturing	58	17.1	88.2
	Technology	40	11.8	100.0
	Total	340	100.0	
Firm Size	Small	267	78.5	78.5
	Medium	73	21.5	100.0
	Total	340	100.0	
Firm Age	Less than 5 years	92	27.1	27.1
	5–10 years	119	35.0	62.1
	More than 10 years	129	37.9	100.0
	Total	340	100.0	
Area	North	67	19.7	19.7
	South	69	20.3	40.0
	East	87	25.6	65.6
	West	51	15.0	80.6
	Central	66	19.4	100.0
	Total	340	100.0	
Position	Owner	168	49.4	49.4
	General Manager	77	22.6	72.1
	IT Manager	42	12.4	84.4

	Operations Manager	53	15.6	100.0
	Total	340	100.0	

In terms of the size of the firms, the sample is dominated by small businesses (78.5%), with medium-sized enterprises making 21.5, which is consistent with the overall representation of the SME population in the emerging economies. Smaller firms are more likely to have even more resource limitations, and their DT and innovation capabilities gain particular significance to sustain performance and competitiveness (Kraus et al., 2022; Otache, 2024). In terms of age of the firm, the sample is balanced, with 37.9% of firms having over 10 years of operation, 35.0% having 5 to 10 years of operation and 27.1% having less than 5 years of operation. This type of distribution allows concentrating the analysis on both mature and comparatively young SMEs that might vary in terms of digital maturity, learning curves, and innovation trajectories (Saputra et al., 2024; Wang and Sun, 2025).

The respondents are also spread geographically in all the major areas of Malaysia with the highest percentage of 25.6 in the eastern, 20.3 in the southern and 19.7 in the northern areas. The geographical dispersion helps to reduce the risk of regional bias and represents different degrees of digital infrastructure and market development, which is known to influence the results of DT in emerging economies (Zaki et al., 2025; Lahon and Chimpi, 2024). Finally, the profile of respondents shows that nearly half of the questionnaires were filled by the owners of the firms (49.4%), and the rest of the questionnaires were filled by the general managers, IT managers, and operations managers. This makes the information more credible and reliable because the respondents are in strategic and operational positions and can directly access digital efforts, innovation, and performance monitoring in their organizations (Saunders et al., 2019; Creswell and Creswell, 2017).

5.2 Measurement Model Assessment

The measurement model was also carefully tested before estimating the structural model to ascertain the sufficiency of the latent constructs with regard to the reliability, convergent and discriminant validity and collinearity diagnostics. Based on the guidelines of Partial Least Squares Structural Equation Modeling (PLS-SEM), several criteria were used, such as the indicator loadings, internal consistency reliability, average variance extracted (AVE), the

Fornell-Larcker criterion, the heterotrait-monotrait ratio (HTMT), and values of variance inflation factor (VIF).

First, the reliability of the indicators was determined through the outer loading. The loadings of all items were greater than the recommended value of 0.70. In particular, the DT loadings were 0.742-0.825, IC loadings were 0.757-0.836, and SMEP loadings were 0.741-0.815 (see Table 3). These values suggest that every observed indicator has a significant amount of variance with its corresponding latent construct, which supports the specification of reflective measurement and ensures that indicators are reliable enough.

The internal consistency reliability was assessed in terms of Cronbach alpha and composite reliability coefficients (rho_a and rho_c). The alpha values of Cronbach were found to be between 0.841 and 0.859 across constructs with composite reliability being higher than 0.88 in all instances. The two sets of coefficients exceed the generally accepted standard of 0.70, which shows that the items that measure each construct have a high level of internal consistency. These results prove that the measurement scales have good reliability to be used in the further structural analysis.

The convergent validity was analyzed using the average variance extracted (AVE). DT, IC, and SMEP had values of 0.612, 0.640, and 0.626 respectively, which is above the recommended minimum of 0.50. This shows that the constructs account more than fifty percent of the variance of their respective indicators which is a good indication of convergent validity and that the indicators are a good measure of the latent variables they represent.

Table 3 Measurement Model Assessment (Reliability and Convergent Validity)

Variable	Factor Loading	α	CR (rho _a)	CR (rho _c)	AVE
DT1	0.760	0.841	0.850	0.887	0.612
DT2	0.813				
DT3	0.767				
DT4	0.742				
DT5	0.825				
IC1	0.793	0.859	0.862	0.899	0.640
IC2	0.836				
IC3	0.812				
IC4	0.799				
IC5	0.757				
SMEP1	0.813	0.851	0.861	0.893	0.626
SMEP2	0.803				
SMEP3	0.815				
SMEP4	0.780				
SMEP5	0.741				

The Fornell-Larcker criterion and the heterotrait-monotrait (HTMT) ratio were used to assess discriminant validity, as indicated in Table 4. The square root of the AVE values of each construct is bigger than the inter-construct correlations, which meets the Fornell-Larcker criterion. Moreover, all HTMT values are below the conservative threshold of 0.85, indicating that the constructs are empirically distinct and that discriminant validity is well established (Henseler et al., 2015; Franke and Sarstedt, 2019).

Table 4 Discriminant validity

HTMT Matrix			
	DT	IC	SMEP
DT			
IC	0.666		
SMEP	0.553	0.609	
Fornell-Larcker Criterion			
DT	0.782		
IC	0.576	0.8	
SMEP	0.475	0.533	0.791

The variance inflation factor (VIF) was used to assess collinearity among the indicators, as shown in Table 5. The VIF values are all below the critical value of 3.3, ranging from 1.647 to 2.061. This indicates that multicollinearity is not a problem and that the structural paths are unlikely to be estimated from redundant information among indicators, thereby ensuring the stability and high quality of the model estimates (Hair et al., 2014; Kock, 2015).

Table 5 Collinearity Assessment (VIF Values)

Variable	VIF	Variable	VIF	Variable	VIF
DT1	1.707	IC1	1.874	SMEP1	1.912
DT2	1.867	IC2	2.061	SMEP2	1.731
DT3	1.676	IC3	1.979	SMEP3	1.908
DT4	1.66	IC4	1.849	SMEP4	1.828
DT5	1.903	IC5	1.647	SMEP5	1.661

5.3 Structural Model Assessment

The structural model was tested to test the hypothesized direct and indirect relationship between DT, IC, and SMEP. The estimated model and estimated path coefficients are shown in Figure 1. The findings show that DT has a positive and statistically significant direct impact on SMEP ($\beta = 0.252$). Also, the DT shows a high and a very strong impact

on the IC ($\beta = 0.576$). On the other hand, IC have a positive impact on SMEP ($\beta = 0.388$).

These results indicate that DT can drive organizational performance in two complementary directions, which are direct performance-enhancing and indirect acting through the formation of IC. Stated differently, in addition to enhancing operational efficiency and responsiveness in itself, DT enhances the capacity of firms to restructure operations, test new solutions, and utilize technological knowledge, which are critical to maintain competitiveness in dynamic and emergent market conditions.

The coefficient of determination (R^2) was used to determine the explanatory power of the model. DT predicts 33.1% of the IC ($R^2 = 0.331$), which is a moderate predictive power. Moreover, the DT and IC can explain the 32.6% of the variance in SMEP ($R^2 = 0.326$), which is a significant explanatory power in the framework of organizational research.

The relationship between the DT and performance through IC is statistically significant, and it demonstrates the presence of partial mediation. This implies that, whilst the digital initiatives have a positive performance impact by themselves, the large percentage of their impact is observed in strengthening internal innovation processes. IC are therefore a major transmission mechanism which converts digital investments in real performance benefits.

All these results justify the integrated RBV and DC approach that underlines the fact that the digital resources yield more positive outcomes when they are conditioned by the organizational capabilities that allow adapting, learning, and renewing the strategy.

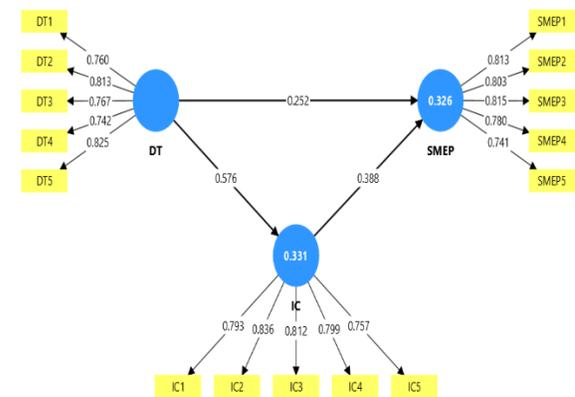


Figure 1 Structural Model Estimation Using PLS-SEM

5.4 Path Coefficients

The proposed hypotheses are completely empirically supported by the structural estimates, which are presented in Table 6. To support H1, first, DT proves to have a positive and statistically significant direct impact on the performance of SMEs ($\beta = 0.252$, $t = 2.412$, $p = 0.016$). This observation implies that the better the level of digital adoption and integration, the better the performance outcomes of the SMEs. In the perspective of RBV, this finding implies that digital technologies are strategic organizational resources that increase efficiency, responsiveness to market forces, and overall firm performance.

Second, the correlation between DT and IC is significant and strong ($\beta = 0.576$, $t = 10.272$, $p < 0.001$), which is a good support of H2. This high coefficient highlights the catalytic nature of DT in enhancing the innovative ability of firms. In particular, it seems that digital initiatives can increase the capacity of SMEs to absorb and recombine knowledge, redesign operational processes, and test new products and services. It is these results that are consistent with the DC framework that highlights the need to sense opportunities, capture technological change, and re-organize internal resources in response to environmental change.

Third, IC has a strong positive effect on SMEP ($\beta = 0.388$, $t = 3.323$, $p = 0.001$), which proves H3. These finding underscores innovation capability as a key success factor in an organization. SMEs that develop innovation-related capabilities in a systematic way, i.e., flexibility in processes, agility in product development, and technological experimentation, are in a better position to turn strategic initiatives into actual performance improvements. The scale of this effect also supports the point that the ability to remain competitive in dynamic markets is based on the ability to renew capabilities continuously, as opposed to the ability to hold resources in place.

Lastly, the indirect impact of DT on the performance of SMEs via IC is positive and statistically significant ($\beta = 0.223$, $t = 2.952$, $p = 0.003$), proving H4 and confirming partial mediation. The fact that there are both high direct and indirect paths suggests that DT improves performance on its own and via its impact on IC. This trend of findings indicates that digital technologies are not enough to achieve the maximum performance results unless they are incorporated into organizational processes that facilitate learning, adaptation and innovation.

In general, the results of this study are good empirical evidence of the integrated RBV- DC framework. They show that digital resources produce better performance in the presence of innovation-oriented capabilities that transform technological investments into sustainable competitive advantages, especially in the institutional and resource constraints that are inherent in emerging markets.

Table 6 Structural Model Results (Direct and Indirect Effects)

	Path	Original Sample	T Test	P Values	Decision
H1	DT to SMEP	0.252	2.412	0.016	Supported
H2	DT to IC	0.576	10.272	0.000	Supported
H3	IC to SMEP	0.388	3.323	0.001	Supported
H4 (Indirect Effect)	DT to IC to SMEP	0.223	2.952	0.003	Supported (Partial Mediation)

5.5 Model Assessment

Table 7 presents the coefficient of determination (R^2) and adjusted R^2 for the endogenous constructs, which assess the model's explanatory power. The findings show that DT accounts for 33.1 percent ($R^2 = 0.331$) of the variance in IC, and that DT and IC together account for 32.6 percent ($R^2 = 0.326$) of the variance in SMEP. According to existing guidelines for PLS-SEM, these values indicate a moderate degree of explanatory power, which is considered acceptable and meaningful in organizational and behavioral studies, particularly in heterogeneous SME settings in emerging markets (Hair et al., 2014; Chin, 2010).

The adjusted R^2 values are a bit lower than the R^2 values, which means that the model is stable, and overfitting is not critical. It means that the predictors included in the model are substantive in describing the variance in SME IC and performance, without overly complex models. On the whole, the model has a decent predictive relevance and it helps to prove the theoretical hypothesis according to which DT and IC are the main causes of SMEP. The findings are also indicative of the relevance of the proposed model and give a solid basis to describe the hypothesized relationships in the framework of the RBV and DC (Kraus et al., 2022; Otache, 2024).

Table 7 Structural Model Assessment

Variable	R-square	R-square adjusted
IC	0.331	0.324
SMEP	0.326	0.313

6. Discussion

The findings are good empirical data to prove the thesis statement that DT is among the most important performance drivers of SMEs in the emerging market environment. The presence of the positive correlation between DT and performance and the statistical significance of the correlation suggests that SMEs that actively use digital technologies in their operations have more efficient, responsive, and effective results. This confirms the view that digital tools, such as analytics systems, digital platforms, and cloud-based infrastructures, may help smaller companies to overcome structural constraints and expand the competitive spectrum. Theoretically, the RBV can be used to explain this finding because it is believed that digital technologies are viewed as a considerable organizational resource that can be utilized to generate performance advantages when effectively incorporated into routines and processes. In the meantime, the moderate magnitude of the effect indicates that DT itself does not always presuppose improved performance, particularly in the new markets with the institutional instability and resources scarcity.

Among the most important additions to the existing body of knowledge is the fact that the research indicates that the DT plays a great role in the capacity to become innovative. These constructs have a high correlation, which indicates that digitalization is a facilitator of organizational learning, experimentation and recombination of knowledge. SMEs that are advancing in their DT efforts appear to be in a better position to redesign processes, introduce new solutions, and apply technological knowledge in a strategic way. This point is quite comparable with the DC viewpoint that emphasizes the importance of feeling opportunities, exploiting technological shifts, and reorganizing internal resources to stay competitive in turbulent environments. DT may be a compensatory element in new markets, where inadequate infrastructure and financial limitations may constrain expansion, by enhancing coordination, agility, and informed decision-making.

The positive role of innovation skills in SMEP extends to confirm the strategic role of innovation as a value creation mechanism. More innovative companies are better placed to respond to the changing customer demands, differentiate their products and services and continue to enhance their operations. This conforms to the overall literature that innovation capability is one of the determinants of SME success, especially in dynamic and competitive environments. It is worth noting that the IC appear to be a process of conversion, i.e. changing digital inputs into real outputs i.e. improved services, more efficient workflows and flexible business models. In this respect, the innovation capability bridges the gap between strategic digital investments and performance gains achieved.

The theoretically most important observation that can emerge as a result of this study is the possibility of the partial mediation of IC. The results show that the DT has a direct and indirect positive impact on the performance, as it affects the formation of the innovation capability. This finding does not favor purely deterministic perceptions of the connection between the DT and performance, but instead, it highlights the mechanisms through which value is created. The existence of the direct and mediated effects means that there is a complementary relationship between the technological resources and the intangible organizational capabilities. As far as the RBV approach is concerned, the digital resources should be supplemented by other competencies, such as knowledge integration and innovation competence, to achieve the potential. Simultaneously, the DC framework describes that the ongoing enhancement of performance is not merely associated with the implementation of technology, but the regeneration and reorganization of capabilities.

The relevance of these relationships is also enhanced by the explanatory power of the model. Despite the fact that the variance explained in IC and SMEP is moderate, it is large in the context of heterogeneous SME environments, where performance outcomes are determined by a large number of contextual variables. In the emerging markets, especially, regulatory complexity, infrastructural differences and unstable market environments influence the market. In these settings, the strategic significance of DT and IC is reflected in the contribution that they have to the performance variance. The results of the study contribute to the increasing number of scholars who believe that DT cannot be considered a single intervention, but a component of a

larger strategic configuration with complementary organizational capabilities.

The contextual information provided by the descriptive patterns found in the sample is also valuable. The average scores of DT and innovation capability adoption among Malaysian SMEs indicate that a large number of firms are still in the middle of the digital maturity. Instead of introducing radical transformation programs, SMEs seem to embrace digital technologies at a slow pace. This gradual development is in line with the financial and human resource limitations that are normally experienced by small companies in emerging economies. Interestingly, the findings show that even small-scale digital investments can lead to significant gains in innovation ability and performance in case they are coordinated with learning-based organizational activities. This observation is especially useful to SMEs that have fewer resources, since it suggests that strategic and capability-based digital projects can be more viable and effective than massive transformation initiatives.

Theoretically, in a broader sense, this research contributes to the knowledge of value creation in emerging-market SMEs by empirically combining the RBV and DC approaches. Whereas RBV describes the role of digital technologies as strategic resources, the DC lens elucidates the processes by which companies change and reorganize their internal operations to maintain performance benefits in the long run. The study addresses the call to include more mechanism-based studies of the results of DT, particularly in less studied emerging market settings, by showing the mediating role of IC.

On the whole, the evidence implies that the concept of DT must not be viewed only as the implementation of technology, but as a change in the organization and strategy. The ability to innovate is central to the ability to convert digital opportunities into continued performance gains, which justifies the importance of SMEs to match technological investments with capability building in order to gain long-term competitive advantage.

7. Conclusion

The research contributes to the existing body of research on DT and SMEP by providing an empirically tested framework, which combines the RBV and the DC perspective in the environment of an emerging market. Though the previous studies have mostly focused on the direct performance implications of DT, the current findings

provide an addition to the existing body of knowledge by showing that IC are a key internal process through which digital initiatives create value. This way, the research goes beyond the linear and deterministic understanding of the DT -performance relationship and offers a more process-oriented account of how technological investments will be converted into quantifiable organizational performance.

The findings show that digital technologies are not to be considered only as strategic resources, as it is implied by RBV, but also as facilitators of capability building. In terms of DC, the DT contributes to the ability of firms to feel opportunities, re-organize resources, and maintain innovation in dynamic settings. The study adds to the SME and innovation literature by empirically validating the partial mediating effect of IC by elucidating that innovation is not a by-product of digitalization, but a complementary capability that enhances the performance effect of digital investments.

Moreover, this study is geographically balanced as it targets Malaysian SMEs, unlike other studies that have concentrated on developed economies. The results thus give context-specific information that captures the institutional, infrastructural, and resource limitations that are inherent in the emerging markets, and contribute to the theoretical discussions with information on under-researched settings.

In a practical sense, the findings highlight the fact that DT brings about the greatest performance benefits when it is supported by purposeful actions to develop IC. This means that organizational efforts that encourage learning, experimentation, process flexibility, and knowledge integration should be complemented by digital investments to SME owners and managers. The digital adoption and innovation-based practices, including cross-functional collaboration, staff skill development, and making decisions based on data, should be strategically aligned to achieve the best returns on digital initiatives.

The implications of the results to policymakers are that the support efforts to improve the digitalization of SMEs should extend beyond the infrastructure and financial aid. The innovation ecosystems, managerial competencies, and knowledge-sharing networks should also be strengthened through the assistance of effective policy interventions to ensure that firms possess the internal competencies to exploit digital technologies in an efficient way. Overall, the study confirms the notion that the concept of DT should be

considered as an organizational development channel and not a technological upgrade.

8. Limitations and Future Research Directions

Despite its theoretical and practical contributions, this study has several limitations that make future research open. Firstly, the cross-sectional design excludes the opportunity to quantify the dynamic development of capability and the long-term effect on performance. DT and innovation capacity building are evolutionary processes; therefore longitudinal research designs would provide more information on the causal processes and temporal changes in these associations. Second, the empirical setting is limited to SMEs that are based in a single emerging economy. Although this background makes the study more internally relevant, it may restrict external generalizability. The role of institutional conditions, regulatory frameworks, and maturity of digital infrastructure in the DT-performance nexus in various contexts may be explored in future studies through cross-country comparative designs.

Third, the model takes IC as the sole mediating construct. Even though the results indicate that it is at the center, other organizational aspects such as digital culture, leadership orientation, absorptive capacity, and strategic flexibility may be mediators or moderators. The framework could have been enhanced by the addition of more capability-based or environmental variables to provide a better understanding of the value creation in SMEs by DT. Addressing these disadvantages would not only improve the conceptualizations of DT in theory, but also provide more practical recommendations to SMEs that are working in the environment of complex and rapidly evolving markets. The future research integrating longitudinal, comparative, and multi-capability perspectives will be particularly helpful in building the knowledge regarding how firms can successfully orchestrate DT to gain sustainable competitive advantage.

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