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FROM DIGITAL TRANSFORMATION CAPABILITY TO PERFORMANCE AND RESILIENCE: THE MEDIATING ROLE OF ORGANIZATIONAL AGILITY IN VIETNAMESE SMEs

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ABSTRACT

This study examines how digital transformation capability (DTC) influences firm performance and organizational resilience through organizational agility in Vietnamese SMEs. DTC is conceptualized as a reflective-formative higher-order construct comprising technological infrastructure, digital integration, and managerial support. Using survey data from 445 SME respondents and Partial Least Squares Structural Equation Modeling (PLS-SEM), the results show that DTC significantly enhances organizational agility, firm performance, and organizational resilience. Organizational agility also positively affects both outcomes and significantly mediates the relationships between DTC and firm performance and between DTC and organizational resilience. The findings indicate that digital transformation creates value not only directly but also through an agility-based capability-conversion mechanism. This study extends the digital transformation literature by integrating performance and resilience outcomes within a unified framework and highlights the importance of organizational agility in translating digital capabilities into organizational value.

KEYWORDS

Digital Transformation Capability, Organizational Agility, Firm Performance, Organizational Resilience, SMEs

1. INTRODUCTION

Digital transformation has evolved from a technology-adoption agenda into a strategic organizational imperative. Firms increasingly rely on digital technologies not merely to automate existing activities, but to redesign business processes, reconfigure organizational structures, improve decision-making, and create new paths to value creation (Bharadwaj et al., 2013; Vial, 2019). Yet the possession or deployment of digital technologies does not, by itself, guarantee superior organizational outcomes. The benefits of digital transformation depend on firms' ability to mobilize technological resources, integrate them with organizational processes, and continuously reconfigure their resource base in response to changing environmental conditions (Teece, 2007; Warner & Wäger, 2019). This distinction is particularly important for small and medium-sized enterprises (SMEs), whose resource constraints can make the conversion of digital investments into tangible organizational value more difficult. Accordingly, recent research has increasingly shifted attention from digital adoption per se toward the organizational capabilities that enable firms to capture value from digital transformation (Saeedikiya et al., 2024; Zhang et al., 2024).

The Dynamic Capabilities View (DCV) provides a useful theoretical lens for explaining this capability-conversion process. Dynamic capabilities enable firms to sense environmental changes, seize emerging opportunities, and reconfigure organizational resources as competitive conditions evolve (Teece, 2007). Within this perspective, digital transformation capability (DTC) can be understood as a firm-level capability that enables organizations to mobilize and integrate digital resources in support of strategic and operational renewal. However, the strategic value of DTC may depend on complementary capabilities that convert digital potential into timely organizational action. Organizational agility (OA) - the capacity to detect changes rapidly, make timely decisions, and flexibly reconfigure resources - represents one such conversion mechanism. Empirical research has shown that digital and information-technology capabilities can facilitate organizational agility and that agility, in turn, contributes to SME performance in volatile environments (Troise et al., 2022). More recent studies similarly demonstrate that SMEs achieve agility through combinations of operational and dynamic IT capabilities and that successful digital transformation requires the alignment of technological and organizational capabilities rather than isolated technological investments (Pelletier et al., 2025; Saeedikiya et al., 2024).

Despite this progress, the mechanisms through which digital transformation capabilities generate organizational value remain insufficiently resolved. One stream of research has primarily examined the relationship among digital transformation, dynamic capabilities, organizational agility, and performance. For example, Setiawan et al. (2025) show that digital transformation and dynamic and agile capabilities jointly contribute to MSME performance, while Troise et al. (2022) demonstrate that digital technology capability promotes organizational agility, which subsequently improves financial and innovation performance. Other research has investigated the antecedents and internal mechanisms of SME digital transformation, emphasizing the interdependence among digital capability, organizational agility, and top-management support (Zhang et al., 2024). Collectively, these studies establish a strong basis for expecting positive relationships among digital capabilities, agility, and firm performance. However, they leave open an important theoretical issue: whether DTC creates organizational value primarily through an agility-based conversion mechanism or whether it also generates value through direct pathways independent of organizational agility.

A parallel research stream has increasingly emphasized organizational resilience (OR) as a critical outcome of digitalization. Organizational resilience refers to a firm's capacity to anticipate potential threats, withstand disruptions, adapt to changing conditions, and recover or renew itself following adversity (Duchek, 2020). Recent evidence indicates that digital technologies can strengthen resilience in SMEs by improving information processing, coordination, flexibility, innovation, and adaptive capacity (Martín-Rojas et al., 2026). At the same time, the relationship between agility and resilience is more nuanced than a simple assumption that both capabilities are interchangeable. A recent systematic review of 121 studies concludes that agility and resilience can be complementary but may also involve different organizational priorities and trade-offs, particularly in resource-constrained SMEs operating in emerging economies (Idrovo Hurel et al., 2026). These developments suggest that performance and resilience should be treated as conceptually distinct forms of organizational value: firm performance captures the effectiveness with which organizations achieve economic, market, and operational objectives, whereas organizational resilience captures their capacity to maintain, adapt, and renew operations under disruption.

Taken together, these research streams reveal two related gaps. First, although prior research provides substantial evidence linking digital capabilities to agility and organizational outcomes, the relative roles of direct and agility-mediated pathways remain unclear. Treating organizational agility solely as an intermediate mechanism may overlook the possibility that DTC also contributes directly to performance and resilience by improving information accessibility, process integration, coordination, and resource deployment. Conversely, focusing only on direct relationships risks obscuring the adaptive organizational processes through which digital resources are converted into realized value. A more complete explanation therefore requires simultaneous examination of both direct and indirect effects. Second, prior studies often emphasize either performance-oriented outcomes or resilience-oriented outcomes. Consequently, less is known about whether the same digital capability and agility mechanisms simultaneously generate economic/operational value and adaptive value, particularly within SMEs where resource constraints make effective capability deployment especially consequential. Addressing these gaps, this study examines DTC, organizational agility, firm performance, and organizational resilience within a unified framework and distinguishes between direct and agility-mediated mechanisms of value creation. Specifically, it addresses the following research questions:

RQ1. How does digital transformation capability influence organizational agility, firm performance, and organizational resilience in SMEs?

RQ2. To what extent does organizational agility mediate the relationships between digital transformation capability and the two distinct organizational outcomes of firm performance and organizational resilience?

To answer these questions, the study draws on the DCV and empirically examines Vietnamese SMEs. The proposed framework specifies DTC as an antecedent of organizational agility while simultaneously allowing DTC to influence firm performance and organizational resilience directly. Organizational agility is further expected to enhance both outcomes and to transmit part of the effects of DTC to them. This structure makes it possible to determine whether digital transformation generates organizational value primarily through agility, through direct capability deployment, or through complementary direct and indirect pathways.

This study makes three contributions. First, it extends the digital transformation literature from a focus on capability possession toward a more explicit examination of capability conversion. Rather than assuming that DTC automatically produces favorable outcomes, the

framework distinguishes the value generated directly by DTC from the value realized through organizational agility. Second, the study integrates firm performance and organizational resilience within the same explanatory model, thereby differentiating between performance-oriented and adaptive outcomes of digital transformation. This provides a more comprehensive account of organizational value creation than approaches centered on a single outcome. Third, by examining these relationships among Vietnamese SMEs, the study extends the empirical application of the DCV to an emerging-economy SME context in which firms must simultaneously pursue digital transformation, operational effectiveness, and adaptive capacity under resource constraints. Together, these contributions provide a more nuanced explanation of how SMEs can translate digital transformation capability into both immediate organizational effectiveness and sustained capacity to respond to disruption.

2. THEORETICAL FRAMEWORKS AND RESEARCH HYPOTHESES

2.1 Theoretical Frameworks

2.1.1 Resource-Based View

The Resource-Based View (RBV) explains differences in firm performance through heterogeneous organizational resources and capabilities (Wernerfelt, 1984; Barney, 1991). According to RBV, resources can support sustained competitive advantage when they are valuable, rare, difficult to imitate, and non-substitutable (Barney, 1991). In technology-intensive contexts, competitive advantage therefore depends not only on access to digital technologies but also on firms' ability to combine them with complementary managerial and organizational resources (Bharadwaj, 2000; Wade & Hulland, 2004).

This perspective provides the foundation for conceptualizing DTC as a multidimensional organizational capability. Digital transformation extends beyond technology adoption and involves the integration of digital technologies with organizational processes, structures, and strategic activities (Bharadwaj et al., 2013; Vial, 2019). In this study, DTC is formed through three complementary components: technological infrastructure, digital integration, and managerial support. Technological infrastructure provides the digital resource base, digital integration connects technologies and information across organizational processes, while managerial support ensures strategic commitment and resource allocation for transformation initiatives. These components are distinct but jointly contribute to a firm's overall digital transformation capability.

RBV therefore explains the resource foundation of DTC and why firms with different configurations of technological and organizational resources may exhibit different levels of digital transformation capability. However, RBV provides a more limited explanation of how these resources are continually adapted and reconfigured in rapidly changing environments. The Dynamic Capabilities View addresses this limitation.

2.1.2 Dynamic Capabilities View

The Dynamic Capabilities View (DCV) focuses on a firm's ability to integrate, build, and reconfigure internal and external competences in response to environmental change (Teece et al., 1997). Teece (2007) further conceptualizes dynamic capabilities through three core processes: sensing opportunities and threats, seizing opportunities, and reconfiguring organizational resources. These processes are particularly relevant to digital transformation, which requires continuous strategic and organizational adaptation rather than one-time technology adoption (Warner & Wäger, 2019).

From this perspective, DTC enables firms to mobilize and integrate digital resources in response to technological and market changes. However, possessing such capability does not automatically generate superior organizational outcomes. Firms must also be able to translate digital resources and information into rapid organizational action. OA represents this adaptive mechanism, reflecting a firm's ability to sense environmental changes and respond quickly through flexible decision-making and resource reconfiguration (Overby et al., 2006; Teece et al., 2016). Empirical evidence further suggests that digital capabilities can enhance organizational agility, which subsequently contributes to SME performance (Troise et al., 2022).

Accordingly, this study positions OA as a capability-conversion mechanism through which DTC is translated into organizational outcomes. At the same time, DTC may also generate direct value by improving information flows, process integration, coordination, and resource deployment. The proposed framework therefore considers both direct effects of DTC and indirect effects through organizational agility.

The study examines two distinct organizational outcomes. Firm performance (FP) reflects economic, market, and operational effectiveness, whereas organizational resilience (OR) refers to the ability to anticipate, withstand, adapt to, and recover from disruptions (Duchek, 2020). Integrating RBV and DCV therefore provides a coherent explanation of how complementary digital resources form DTC and how this capability generates both performance-oriented and adaptive value, directly and through organizational agility.

2.2 Research Hypotheses

2.2.1 Digital Transformation Capability and Organizational Agility

Digital transformation capability enhances a firm’s ability to identify technological opportunities, integrate digital resources, and reconfigure organizational processes in response to environmental change (Sambamurthy et al., 2003; Mikalef et al., 2021). Firms with stronger digital capabilities can access and process information more rapidly, improve cross-functional coordination, and develop digital platforms that facilitate faster strategic and operational responses (Lu & Ramamurthy, 2011; Ravichandran, 2018). These capabilities are particularly important in turbulent environments because organizational responsiveness depends not simply on technology investment but on the firm’s ability to mobilize technological resources and complementary organizational capabilities effectively (Ravichandran, 2018; Mikalef et al., 2021). Recent evidence from SMEs similarly indicates that digital technology capabilities contribute to the development of organizational agility by strengthening firms’ capacity to anticipate and respond to changes in increasingly volatile business environments (Troise et al., 2022; Pelletier et al., 2025).

From a dynamic capabilities perspective, organizational agility represents the ability to convert digitally enabled sensing and resource-reconfiguration potential into timely organizational action (Sambamurthy et al., 2003; Lu & Ramamurthy, 2011). Empirical studies show that firms with superior IT and digital capabilities are better able to adjust operational processes, exploit emerging market opportunities, and respond rapidly to environmental shifts (Lu & Ramamurthy, 2011; Ravichandran, 2018). In the SME context, digital technologies are particularly relevant to agility because they improve information availability and coordination while enabling resource-constrained firms to adapt more effectively to uncertainty (Troise et al., 2022; Pelletier et al., 2025). Accordingly, stronger digital transformation capability should increase the firm's capacity to sense environmental changes, make timely decisions, and reconfigure resources rapidly, thereby enhancing organizational agility (Troise et al., 2022; Mikalef et al., 2021).

H1. Digital transformation capability positively influences organizational agility.

2.2.2 Organizational Agility and Organizational Outcomes

Organizational agility enables firms to detect changes in markets and customer needs, accelerate decision-making, and reconfigure organizational resources in response to emerging opportunities and threats (Tallon & Pinsonneault, 2011; Shin et al., 2015). By shortening response times and improving coordination across organizational functions, agile firms can adapt operations more efficiently and align products, processes, and resource allocation with changing competitive conditions (Roberts & Grover, 2012; Shin et al., 2015). Empirical evidence from SMEs shows that strategic agility enhances operational responsiveness and contributes to important dimensions of firm performance, including customer retention and financial and innovation outcomes (Shin et al., 2015; Troise et al., 2022). Accordingly, organizational agility can improve firm performance by enabling firms to respond more rapidly to environmental changes and exploit emerging opportunities more effectively than less agile competitors (Shin et al., 2015; Troise et al., 2022).

Organizational agility is also closely associated with a firm's capacity to withstand and adapt to disruptions because rapid sensing and flexible resource reallocation allow organizations to respond before environmental shocks substantially impair their operations (Duchek, 2020; Yağmur & Myrvang, 2023). Agile organizations can modify processes, redirect resources, and coordinate responses more rapidly during crises, thereby strengthening their capacity to maintain continuity and adapt under adverse conditions (Yağmur & Myrvang, 2023; Loh & Tan, 2026). Empirical evidence demonstrates a significant positive effect of organizational agility on organizational resilience, while recent research among manufacturing SMEs similarly confirms that agility acts as an important antecedent of resilience and subsequent organizational recovery (Yağmur & Myrvang, 2023; Loh & Tan, 2026). Thus, the ability to respond rapidly and flexibly to environmental change should enhance not only immediate organizational effectiveness but also the firm's longer-term capacity to absorb, adapt to, and recover from disruption (Duchek, 2020; Loh & Tan, 2026).

H2. Organizational agility positively influences firm performance.

H3. Organizational agility positively influences organizational resilience.

2.2.3 Direct Effects of Digital Transformation Capability

Beyond its role in enabling organizational agility, digital transformation capability can generate organizational value directly through two complementary pathways: improving the efficiency and competitiveness of current operations and strengthening the firm's capacity to function

under disruption (Trieu et al., 2023; Khurana et al., 2022). From a performance-enhancing pathway, stronger digital capabilities improve information accessibility, process coordination, data-driven decision-making, and the utilization of organizational resources, allowing firms to reduce operational inefficiencies and respond more effectively to market opportunities (Prakasa & Jumani, 2024; Kim & Jin, 2024). Recent empirical evidence confirms that digital capabilities exert a significant positive effect on SME performance, including financial, operational, flexibility, and quality-related outcomes (Prakasa & Jumani, 2024; Kim & Jin, 2024). Evidence from Vietnamese SMEs similarly demonstrates that IT capabilities directly enhance firm performance, indicating that technologically enabled organizational capabilities can create economic value even when other adaptive mechanisms are simultaneously considered (Trieu et al., 2023).

At the same time, DTC can create resilience-enhancing value by improving information visibility, communication, digital connectivity, and the ability to reorganize activities when normal operations are disrupted (Khurana et al., 2022; Martín-Rojas et al., 2026). Digital technologies allow SMEs to maintain critical activities, access alternative channels, coordinate dispersed resources, and modify business processes during crises, thereby strengthening their capacity to absorb and adapt to environmental shocks (Khurana et al., 2022; Martín-Rojas et al., 2026). Empirical evidence from Vietnamese SMEs shows that IT capabilities have a significant direct effect on organizational resilience, while more recent evidence confirms that digital technologies constitute an important driver of resilience development among SMEs operating under uncertain conditions (Trieu et al., 2023; Martín-Rojas et al., 2026). Therefore, DTC is expected to generate both performance-oriented value through more effective resource utilization and adaptive value through enhanced continuity and response capacity, independently of the additional benefits transmitted through organizational agility (Trieu et al., 2023; Kim & Jin, 2024; Martín-Rojas et al., 2026).

H4. Digital transformation capability positively influences firm performance.

H5. Digital transformation capability positively influences organizational resilience.

2.2.4 The Mediating Role of Organizational Agility

The existence of direct benefits from digital transformation capability does not fully explain how digital resources are converted into superior organizational outcomes, because the realization of digital value often depends on complementary organizational capabilities that enable firms to act on technological resources and information (Mikalef & Pateli, 2017; Ayadi et al., 2024). Organizational agility provides such a transmission mechanism by enabling firms to transform digitally enabled information, connectivity, and coordination into faster decisions, flexible process adjustments, and timely resource reallocation (Li et al., 2025; Ayadi et al., 2024). Empirical evidence shows that agility mediates the relationship between IT-enabled dynamic capabilities and competitive performance, indicating that technological capabilities generate performance benefits partly by strengthening firms' ability to respond and adapt to environmental change (Mikalef & Pateli, 2017). More recent evidence similarly demonstrates that firm agility transmits the effects of digital platform capabilities to firm performance and that digitally enabled organizational agility improves decision-making performance by converting digital capabilities into more responsive organizational action (Ayadi et al., 2024; Li et al., 2025). Thus, DTC is expected to enhance firm performance not only through its direct operational benefits but also indirectly by developing the organizational agility required to exploit digital resources more effectively (Mikalef & Pateli, 2017; Ayadi et al., 2024).

A similar transmission mechanism is expected for organizational resilience, because digital resources enhance resilience most effectively when firms can use them to detect disruptions rapidly, coordinate responses, and reconfigure activities as conditions change (Zhang et al., 2025; Ahmed et al., 2025). Recent longitudinal evidence shows that digital transformation strengthens organizational resilience partly through agile response, as digitally enabled information processing and rapid decision-making improve firms' capacity to adjust to environmental shocks (Zhang et al., 2025). Evidence from manufacturing SMEs likewise demonstrates that digital agility mediates the effects of digital technologies and digital capabilities on resilience, supporting the argument that digital resources must be mobilized through adaptive organizational capabilities to generate resilient responses (Ahmed et al., 2025). Organizational agility therefore represents a common conversion mechanism through which DTC can generate both performance-oriented value, by improving the speed and effectiveness of organizational action, and adaptive value, by strengthening the capacity to respond to and recover from disruption (Ayadi et al., 2024; Zhang et al., 2025; Ahmed et al., 2025). Accordingly, the following mediation hypotheses are proposed:

H6. Organizational agility mediates the relationship between digital transformation capability and firm performance.

H7. Organizational agility mediates the relationship between digital transformation capability and organizational resilience.

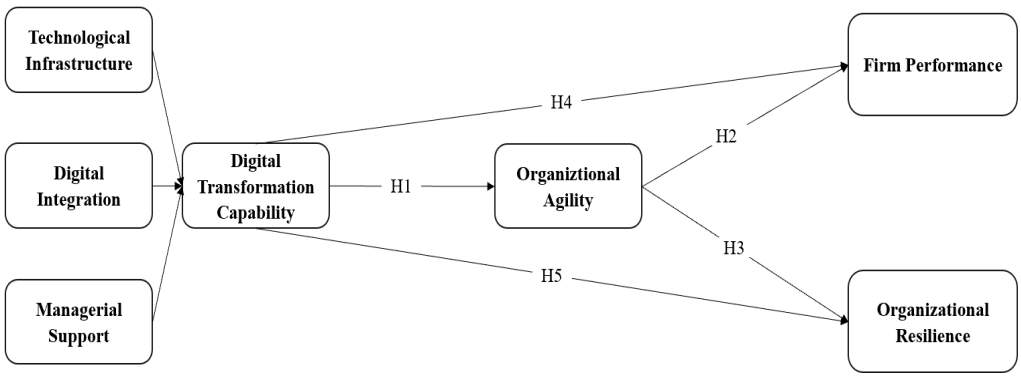


Figure 1. Conceptual framework
Source(s): Authors' own work

3. METHODOLOGY

3.1 Instruments

This study employed a structured questionnaire to measure the constructs included in the proposed research model. All measurement items were adapted from established literature and assessed using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). The questionnaire covered digital transformation capability (DTC), organizational agility (OA), firm performance (FP), and organizational resilience (OR). Consistent with the

multidimensional nature of digital transformation, DTC was specified as a Type II reflective-formative higher-order construct, comprising three reflective lower-order components: technological infrastructure (TI), digital integration (DI), and managerial support (MS). These dimensions capture the technological, integrative, and managerial foundations required for firms to develop and sustain digital transformation capability (Bharadwaj, 2000; Vial, 2019; Warner & Wäger, 2019). At the higher-order level, TI, DI, and MS were modeled as complementary components that jointly form DTC, consistent with established guidelines for hierarchical component models in PLS-SEM (Becker et al., 2012; Sarstedt et al., 2019).

Organizational agility was measured using items reflecting firms' ability to sense environmental changes, respond rapidly to emerging opportunities and threats, and adjust organizational activities, accordingly, drawing primarily on established agility measures in the information systems and strategic management literature (Lu & Ramamurthy, 2011; Tallon & Pinsonneault, 2011). Firm performance was assessed using subjective indicators capturing firms' perceived operational, market, and overall business performance relative to their organizational objectives and competitive environment, following established approaches commonly adopted in SME and strategic management research (Venkatraman & Ramanujam, 1986; Shin et al., 2015). Organizational resilience was measured through items reflecting the organization's capacity to anticipate disruptions, maintain critical operations, adapt to adverse conditions, and recover following unexpected events (Lengnick-Hall et al., 2011; Duchek, 2020; Hillmann & Guenther, 2021).

To ensure linguistic and contextual equivalence, the original English questionnaire was translated into Vietnamese and subsequently back-translated into English following established cross-cultural survey procedures (Brislin, 1970). The preliminary instrument was reviewed by academic experts and managerial respondents to evaluate content clarity, relevance, and contextual appropriateness. A pilot test involving 30 SME managers was subsequently conducted before the main survey, and minor wording modifications were made based on respondent feedback. Internal consistency of the reflective constructs was initially examined during the pilot stage, with Cronbach's alpha values exceeding the recommended threshold of 0.70 (Hair et al., 2021). The final measurement model was subsequently subjected to comprehensive reliability and validity assessment using PLS-SEM.

3.2 Sampling and Data Collection

The target population comprised Vietnamese SMEs that had adopted or were actively implementing digital transformation initiatives. SMEs were identified in accordance with the national classification criteria stipulated in Decree No. 80/2021/ND-CP of the Government of Vietnam. Because the study required respondents with sufficient knowledge of firm-level digital and organizational activities, a purposive sampling approach was employed. Eligible respondents were managers who were directly involved in, or sufficiently familiar with, digital transformation, strategic decision-making, and operational processes within their organizations.

Data were collected over a three-month period through both online and direct questionnaire distribution. Before completing the survey, respondents were informed of the academic purpose of the study and assured that their responses would remain anonymous and confidential. The questionnaire targeted senior, middle, and junior managers because these respondents were considered sufficiently knowledgeable to evaluate their firms' digital capabilities,

organizational agility, performance, and resilience. The demographic characteristics of the respondents are summarized in Table 1.

Returned questionnaires were screened for completeness and response quality before the final analysis. Responses containing substantial missing information or indications of inattentive answering were excluded. Each respondent represented a different SME, resulting in a final analytical sample of 445 firms. This sample size was considered adequate for PLS-SEM analysis given the complexity of the proposed structural model and was substantially above commonly recommended minimum levels for variance-based structural equation modeling (Kock & Hadaya, 2018; Hair et al., 2021).

Table 1. Description of the research sample

Characteristics			
Category	**Classification**	**Sample**	**Proportion (%)**
Gender	Male	232	52.1
	Female	207	46.5
	Others	6	1.3
Managerial Position	Senior Managers	96	21.6
	Middle Managers	181	40.7
	Junior Managers	168	37.8
Age	Under 30	124	27.9
	30-39	186	41.8
	40 and above	135	30.3
Firm size	Micro Enterprise	74	16.6
	Small Enterprise	218	49.0
	Medium Enterprise	153	34.4
Industry	Manufacturing	142	31.9
	Services	177	39.8
	Trade and Retail	96	21.6
	Other Industries	30	6.7
Firm Age	Less than 5 years	101	22.7
	5 - 10 years	196	44.0
	More than 10 years	148	33.3
Total respondents = 445			

Source(s): Authors' own work

3.3 Data Analysis

Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed using SmartPLS 3 to estimate the proposed research model. PLS-SEM was considered appropriate because the study examines a relatively complex model involving a higher-order construct, multiple endogenous variables, and mediation relationships, while emphasizing the explanation of variance in organizational outcomes (Hair et al., 2021; Sarstedt et al., 2019). The approach is

also suitable for models containing both reflective and formative measurement specifications and relies on nonparametric bootstrapping for statistical inference (Hair et al., 2021).

An embedded two-stage approach was employed to estimate the reflective-formative higher-order construct. In Stage 1, the repeated-indicators approach was used to estimate the reflective lower-order components and obtain their latent variable scores. In Stage 2, the scores of technological infrastructure, digital integration, and managerial support were used as formative indicators of DTC, after which the structural model was estimated (Becker et al., 2012; Sarstedt et al., 2019).

In the first analysis, the reflective constructs were assessed using conventional measurement-model criteria. Indicator reliability was examined through outer loadings, while internal consistency and convergent validity were evaluated using Cronbach's alpha, composite reliability, and average variance extracted (AVE) (Hair et al., 2021). Discriminant validity was assessed using both the Fornell-Larcker criterion and the heterotrait-monotrait ratio (HTMT) (Fornell & Larcker, 1981; Henseler et al., 2015). In the second analysis, DTC was evaluated as a formative higher-order construct following a causal-formative specification, in which technological infrastructure, digital integration, and managerial support jointly form DTC. Accordingly, collinearity among these formative components was examined using variance inflation factors (VIFs), while the magnitude, significance, and relevance of their contributions to DTC were assessed through outer weights and bootstrapping results (Hair et al., 2021; Sarstedt et al., 2019).

After establishing the adequacy of both reflective and formative measurement specifications, the structural model was assessed using collinearity diagnostics, standardized path coefficients, coefficients of determination (R^2), and effect sizes (f^2) (Hair et al., 2021). Statistical significance was evaluated through a nonparametric bootstrapping procedure with 5,000 subsamples and 95% confidence intervals. The mediating role of organizational agility was examined using the specific indirect effects of DTC on firm performance and organizational resilience, with mediation established when the corresponding bootstrapped confidence intervals excluded zero (Nitzl et al., 2016; Hair et al., 2021).

4. RESULTS

4.1 Measurement Model Evaluation

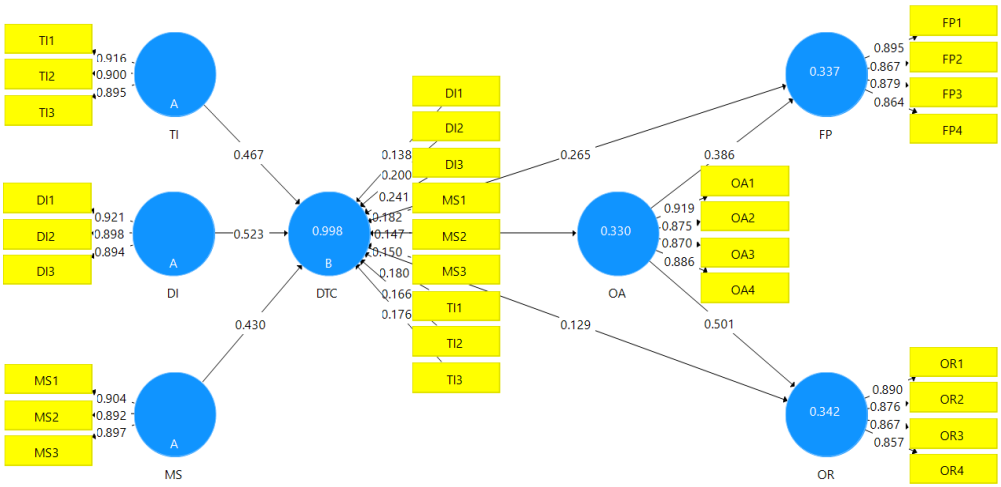


Figure 2. Stage-1 estimation of the reflective-formative higher-order construct
Source(s): Authors' own work

The results of the first-order measurement model are presented in Table 2. All indicator loadings exceeded the recommended threshold of 0.708, ranging from 0.857 to 0.921, indicating satisfactory indicator reliability. Cronbach's alpha values ranged from 0.880 to 0.910, while composite reliability values ranged from 0.926 to 0.937, confirming adequate internal consistency across all reflective constructs. In addition, the AVE values ranged from 0.761 to 0.818, well above the minimum threshold of 0.50.

Discriminant validity was assessed using both the Fornell-Larcker criterion and the HTMT, as reported in Table 3. For the Fornell-Larcker criterion, the square root of the AVE for each construct exceeded its correlations with all other constructs. Specifically, the diagonal values ranged from 0.873 to 0.905, whereas the inter-construct correlations were considerably lower, with the highest correlation observed between organizational agility and organizational resilience ($r = 0.575$). The HTMT results further supported discriminant validity, as all values remained below the conservative threshold of 0.85. The highest HTMT value was 0.636 between organizational agility and organizational resilience.

The assessment of the higher-order construct is shown in Table 4. All three lower-order components contributed positively and significantly to DTC. Digital integration exhibited the largest relative contribution to DTC ($w = 0.523$, $t = 8.673$, $p < 0.001$), followed by technological infrastructure ($w = 0.467$, $t = 8.054$, $p < 0.001$) and managerial support ($w = 0.430$, $t = 6.899$, $p < 0.001$). The VIF values for digital integration (1.116), managerial support (1.090), and technological infrastructure (1.103) were all substantially below the commonly recommended threshold of 3.0, indicating that multicollinearity is not a concern among the formative components. These results support the use of DI, MS, and TI as distinct and complementary dimensions in forming the higher-order DTC construct. The corresponding sample means were highly consistent with the original estimates, indicating stable bootstrap results.

Table 2. Reflective Measurement Model Assessment

Constructs	Items	Outer Loadings	Cronbach's Alpha	Composite Reliability	AVE
Digital Integration (DI)	DI1	0.921	0.889	0.931	0.818
	DI2	0.898			
	DI3	0.894			
Technological Infrastructure (TI)	TI1	0.916	0.888	0.931	0.817
	TI2	0.900			
	TI3	0.895			
Managerial Support (MS)	MS1	0.904	0.880	0.926	0.806
	MS2	0.892			
	MS3	0.897			
Organizational Agility (OA)	OA1	0.919	0.910	0.937	0.788
	OA2	0.875			
	OA3	0.870			
	OA4	0.886			
Firm Performance (FP)	FP1	0.895	0.900	0.930	0.769
	FP2	0.867			
	FP3	0.879			
	FP4	0.864			
Organizational Resilience (OR)	OR1	0.890	0.895	0.927	0.761
	OR2	0.876			
	OR3	0.867			
	OR4	0.857			

Source(s): Authors' own work

Table 3. Fornell-Larcker Criterion and Heterotrait-Monotrait Ratio (HTMT)

	DI	FP	MS	OA	OR	TI
Fornell-Larcker criterion results						
DI	0.905					
FP	0.350	0.877				
MS	0.240	0.352	0.898			
OA	0.423	0.538	0.372	0.888		
OR	0.334	0.373	0.239	0.575	0.873	
TI	0.262	0.320	0.215	0.407	0.299	0.904
The Heterotrait–Monotrait ratio results						
Construct						
DI						
FP	0.392					
MS	0.271	0.395				
OA	0.470	0.593	0.415			
OR	0.374	0.415	0.270	0.636		
TI	0.293	0.356	0.242	0.451	0.335	

Source(s): Authors' own work

Table 4. Assessment of the Formative Higher-Order Construct

Constructs	Outer Weight	T-value	P-value	VIF
Digital Transformation Capability (DTC)				
Digital Integration (DI)	0.523	8.673	<0.001	1.116
Managerial Support (MS)	0.430	6.899	<0.001	1.090
Technological Infrastructure (TI)	0.467	8.054	<0.001	1.103

Source(s): Authors' own work

4.2 Structural Model Evaluation

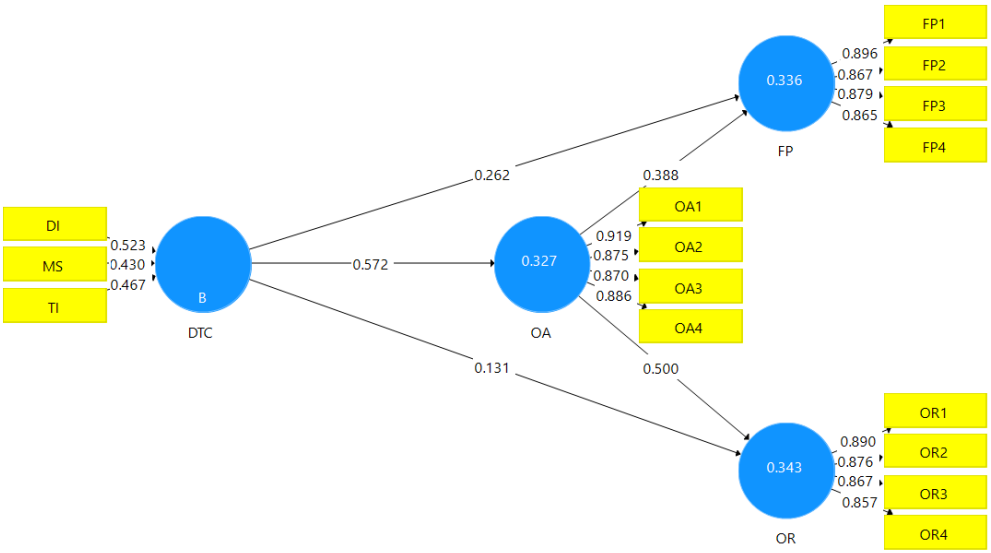


Figure 3. Stage-2 PLS-SEM structural model results
Source(s): Authors' own work

Table 5 further reports the collinearity assessment among the predictor constructs in the structural model. The VIF value for DTC in predicting organizational agility was 1.000, while the VIF values for DTC and organizational agility in predicting firm performance and organizational resilience were 1.486. All values remained well below the recommended threshold, indicating the absence of problematic collinearity among the predictor constructs.

Table 5. Assessment of Inner VIF Values in the Structural Model

	DTC	FP	OA	OR
DTC		1.486	1.000	1.486
OA		1.486		1.486

Source(s): Authors' own work

Table 6 presents the results of the structural model and hypothesis testing. All direct relationships were positive and statistically significant. Digital transformation capability had a significant positive effect on firm performance ($\beta = 0.262$, $t = 5.563$, $p < 0.001$), organizational agility ($\beta = 0.572$, $t = 17.476$, $p < 0.001$), and organizational resilience ($\beta = 0.131$, $t = 2.767$, $p = 0.006$). Organizational agility also exerted significant positive effects on firm performance ($\beta = 0.388$, $t = 8.160$, $p < 0.001$) and organizational resilience ($\beta = 0.500$, $t = 12.571$, $p < 0.001$). These findings provide support for all proposed direct-effect hypotheses.

The mediation results further show that organizational agility significantly transmitted the effects of digital transformation capability to both organizational outcomes. The indirect effect of DTC on firm performance through organizational agility was significant ($\beta = 0.222$, $t = 7.299$, $p < 0.001$), while the indirect effect on organizational resilience was also significant ($\beta = 0.286$, $t = 9.481$, $p < 0.001$).

Table 6. Testing hypotheses in the structural model

Hypothesis	Original Sample (O)	Confidence Intervals (97.5%)	Confidence Intervals (2.5%)	Standard Deviation (STDEV)	*t*-statistics (|O/STDEV|)	*p*-value	Results
DTC -> FP	0.262	0.355	0.169	0.047	5.563	<0.001	Supported
DTC -> OA	0.572	0.635	0.508	0.033	17.476	<0.001	Supported
DTC -> OR	0.131	0.224	0.039	0.047	2.767	0.006	Supported
OA -> FP	0.388	0.480	0.293	0.048	8.160	<0.001	Supported
OA -> OR	0.500	0.576	0.423	0.040	12.571	<0.001	Supported
DTC -> OA -> FP	0.222	0.283	0.162	0.030	7.299	<0.001	Supported
DTC -> OA -> OR	0.286	0.348	0.230	0.030	9.481	<0.001	Supported

Source(s): Authors' own work

Table 7 reports the coefficients of determination (R^2) for the endogenous constructs. The model explains 33.6% of the variance in FP, 32.7% in OA, and 34.3% in OR. The adjusted R^2 values are only slightly lower than the corresponding R^2 values (0.333 for FP, 0.326 for OA, and 0.340 for OR), indicating limited inflation due to model complexity.

Table 8 presents the effect sizes (f^2) of the individual structural relationships. DTC has a large effect on organizational agility ($f^2 = 0.486$), indicating that DTC is a major explanatory factor for OA. Its effect on firm performance is small ($f^2 = 0.070$), while its direct effect on organizational resilience is negligible to very small ($f^2 = 0.018$). In contrast, organizational agility exhibits a moderate effect on firm performance ($f^2 = 0.153$) and a moderate effect on organizational resilience ($f^2 = 0.256$).

Table 7. Coefficients of Determination (R^2)

	R Square	R Square Adjusted
FP	0.336	0.333
OA	0.327	0.326
OR	0.343	0.340

Source(s): Authors' own work

Table 8. Effect Sizes (f^2)

	DTC	FP	OA	OR
DTC		0.070	0.486	0.018
FP				
OA		0.153		0.256
OR				

Source(s): Authors' own work

4.3 Discussion

The primary objective of this study is to explain how DTC contributes to FP and OR through both direct pathways and the mediating role of OA in Vietnamese SMEs. While previous studies have established important links between digital capabilities, agility, and organizational outcomes, these relationships have often been examined separately or with a primary emphasis on performance-related outcomes (Mikalef & Pateli, 2017; Troise et al., 2022). By simultaneously examining performance and resilience and distinguishing between direct and agility-mediated effects, the present study provides a more integrated account of how SMEs convert digital transformation capability into economic and adaptive value. In addition, the formative higher-order specification shows that DTC is jointly constituted by digital integration, technological infrastructure, and managerial support, with all three components contributing significantly to the construct. This result reinforces the view that digital transformation is not merely a technological investment but a broader organizational capability that depends on the integration of technological resources with managerial and organizational mechanisms (Matarazzo et al., 2021; Warner & Wäger, 2019).

First, the results show that DTC strongly enhances organizational agility ($\beta = 0.572$, $p < 0.001$), with a large effect size ($f^2 = 0.486$). This finding is consistent with Troise et al. (2022), who found that digital technology capabilities are important antecedents of organizational agility in SMEs, and with Ahmed et al. (2022), who showed that digital platform capability facilitates agility in emerging-market manufacturing SMEs. The result can be explained by the informational and coordinative advantages created by digital transformation capability. Firms with stronger DTC can access information more rapidly, integrate data across functions, and use digital systems to shorten communication and decision-making cycles, thereby improving their ability to respond to environmental changes (Ravichandran, 2018). This mechanism is particularly relevant to SMEs because their relatively limited financial, human, and managerial resources make rapid information processing and resource redeployment especially important when market conditions change. Digital tools alone, however, are unlikely to produce such responsiveness unless technological infrastructure is integrated into organizational routines and supported by managerial commitment. The significant contributions of digital integration, technological infrastructure, and managerial support to DTC therefore help explain why DTC has such a substantial effect on agility. From the Dynamic Capabilities View, this finding suggests that digital transformation strengthens the organizational foundation required for sensing changes and rapidly reconfiguring resources, thereby translating digital potential into adaptive action (Teece, 2007; Warner & Wäger, 2019).

Second, organizational agility significantly improves both firm performance and organizational resilience, although the magnitude of these relationships differs. OA positively affects firm performance ($\beta = 0.388$, $p < 0.001$), confirming that the capacity to respond rapidly and flexibly to changing conditions can generate tangible organizational benefits. This finding broadly supports Shin et al. (2015), who showed that strategic agility improves operational responsiveness and customer retention among Korean SMEs, although their evidence for financial performance was less conclusive. It is also consistent with Troise et al. (2022), who reported positive effects of agility on financial and innovation performance in SMEs. In Vietnamese SMEs, agility may be particularly valuable because firms frequently operate with limited slack resources and therefore cannot rely solely on large resource buffers when customer requirements, technological conditions, or competitive pressures change. Faster decision-making, flexible coordination, and timely resource reallocation allow SMEs to exploit new opportunities while reducing the costs associated with delayed organizational responses. The moderate effect size of OA on FP ($f^2 = 0.153$) indicates that agility is therefore not simply an abstract adaptive capability but an important mechanism through which firms improve operational and market effectiveness.

OA also exhibits a substantial positive effect on organizational resilience ($\beta = 0.500$, $p < 0.001$; $f^2 = 0.256$). This result indicates that agility may be particularly important when organizational value depends on adaptation under disruption rather than efficiency under relatively stable conditions. Organizational resilience requires firms to anticipate threats, cope with unexpected disturbances, maintain essential activities, and adapt after disruptive events (Duchek, 2020). Agility supports these processes by enabling organizations to detect emerging problems earlier, accelerate decisions, modify routines, and redirect resources as circumstances evolve. The result is consistent with Yağmur and Myrvang (2023), whose findings demonstrate a close relationship between organizational agility, crisis management, and resilience. The numerically larger OA-OR coefficient suggests that agility may play a particularly important role in resilience: while agility improves both economic effectiveness and adaptive capacity, its value becomes especially visible when firms must adjust to uncertainty and disruption. For resource-constrained SMEs, resilience may depend less on maintaining excess resources and more on the ability to redeploy available resources quickly and effectively.

Third, DTC directly enhances both firm performance and organizational resilience, but the magnitude of these effects reveals an important distinction. The positive effect of DTC on firm performance ($\beta = 0.262$, $p < 0.001$) indicates that firms can derive performance benefits directly from their digital transformation capabilities. Digital integration can reduce information fragmentation, technological infrastructure can improve process efficiency and information availability, and managerial support can facilitate coordinated deployment of digital resources. This result is broadly consistent with Trieu et al. (2023), who found that IT capabilities contribute to both performance and resilience among Vietnamese SMEs. It also corresponds with research showing that digital transformation can alter value-creation processes and strengthen SME competitiveness when digital technologies are supported by appropriate organizational capabilities (Matarazzo et al., 2021). However, the relatively small effect size of DTC on FP ($f^2 = 0.070$) indicates that the direct possession and deployment of digital capability explain only part of the resulting performance gains. This result supports the broader dynamic-capability argument that resources create greater value when they are translated into organizational responses rather than merely accumulated.

The direct DTC-OR relationship is also statistically significant ($\beta = 0.131$, $p = 0.006$), but its effect size is very small ($f^2 = 0.018$). This finding is particularly important because statistical significance alone could otherwise lead to an overstatement of the substantive role of DTC in building resilience. Prior research shows that digital technologies can help SMEs maintain operations, reorganize business activities, and develop resilience during periods of severe disruption (Khurana et al., 2022). Similarly, evidence from Vietnamese SMEs indicates that IT capabilities can directly facilitate organizational resilience (Trieu et al., 2023). Nevertheless, the small effect observed here suggests that digital capability by itself is insufficient to create substantial resilience. An SME may possess digital platforms, integrated information systems, or advanced technological infrastructure, but such resources provide limited protection if the organization cannot act rapidly on the information they generate. In this sense, DTC provides the technological and organizational potential for resilience, whereas adaptive capabilities determine whether that potential is effectively activated when disruption occurs.

Fourth, the mediation results clarify this capability-conversion mechanism. Organizational agility significantly mediates the effect of DTC on firm performance ($\beta = 0.222$, $p < 0.001$), while the direct DTC-FP relationship remains significant. Thus, OA exhibits complementary partial mediation. This finding is consistent with Mikalef and Pateli (2017), who showed that IT-enabled dynamic capabilities enhance competitive performance indirectly through organizational agility. Rather than suggesting that digital transformation capability and agility are alternative explanations for performance, the results indicate that they operate sequentially and complementarily. DTC can generate direct efficiency and coordination benefits, but it also develops the firm's capacity to sense changing conditions, adjust processes, and exploit market opportunities through OA. For SMEs, this distinction is particularly relevant because technological investment does not necessarily generate performance improvements when organizational routines remain rigid. The performance value of digital transformation is therefore partly embedded in technology and integration themselves and partly created when those resources enable more responsive organizational action.

A similar but even more pronounced mechanism emerges for organizational resilience. OA significantly mediates the DTC-OR relationship ($\beta = 0.286$, $p < 0.001$), while the direct effect of DTC on OR remains positive and significant. The coexistence of significant direct and indirect effects again indicates complementary partial mediation. However, the indirect effect through agility is considerably larger than the direct DTC-OR effect ($\beta = 0.131$), suggesting that an important part of the association between DTC and resilience operates through organizational agility. This result closely aligns with Zhang et al. (2025), who found that agile response mediates the relationship between digital transformation and organizational resilience by improving information processing, decision efficiency, and organizational adaptability. It also parallels recent evidence from manufacturing SMEs showing that digital agility transmits the effects of digital technologies and capabilities to resilience-related outcomes (Ahmed et al., 2025). Thus, digital transformation appears to provide SMEs with greater visibility and connectivity during uncertainty, whereas agility determines whether these digital advantages can be converted into rapid adjustment, operational continuity, and recovery.

Finally, the overall pattern of explanatory power and effect sizes reinforces the study's central capability-conversion argument. The proposed model explains 32.7% of the variance in organizational agility, 33.6% in firm performance, and 34.3% in organizational resilience. More importantly, DTC has its largest substantive effect on OA ($f^2 = 0.486$), whereas OA subsequently has stronger effects on FP ($f^2 = 0.153$) and OR ($f^2 = 0.256$) than the respective direct effects of DTC. This pattern suggests a layered value-creation process in which

technological infrastructure, digital integration, and managerial support first form a digital transformation capability, which then produces organizational outcomes both directly and by strengthening agility. The findings therefore refine the simple assumption that digital transformation automatically generates superior outcomes. Consistent with the Resource-Based View, complementary technological and organizational resources establish the foundation for DTC; however, consistent with the Dynamic Capabilities View, these resources generate greater value when they are mobilized through adaptive capabilities that enable rapid sensing, decision-making, and resource reconfiguration (Teece, 2007; Mikalef & Pateli, 2017). In Vietnamese SMEs, digital transformation capability can therefore be understood not as an endpoint but as an enabling capability whose organizational value is substantially amplified through agility.

5. THEORETICAL IMPLICATIONS

This study provides several theoretical contributions to the literature on digital transformation and organizational capabilities. First, it extends the RBV and DCV by demonstrating that DTC generates organizational value through both direct and indirect pathways. While RBV emphasizes the strategic value of firm-specific resources, the findings show that possessing digital resources alone is not sufficient to maximize organizational outcomes. Instead, organizational agility acts as an important conversion mechanism through which digital capabilities are transformed into improved firm performance and organizational resilience. This supports the dynamic capability argument that resources create greater value when firms can rapidly sense environmental changes and reconfigure their activities accordingly (Teece, 2007; Mikalef & Pateli, 2017).

Second, the study contributes by conceptualizing DTC as a multidimensional higher-order capability formed by technological infrastructure, digital integration, and managerial support. This perspective moves beyond technology-centered interpretations of digital transformation and emphasizes the complementary role of technological and managerial resources. In addition, by examining firm performance and organizational resilience simultaneously, the study distinguishes between performance-oriented value and adaptive value. The relatively larger estimated effect of organizational agility on resilience suggests that the mechanisms through which digital transformation creates value may differ depending on the organizational outcome being considered.

6. PRACTICAL IMPLICATIONS

The findings also provide several practical implications for SME managers. First, digital transformation should not be treated simply as the adoption of new technologies. Managers should develop technological infrastructure together with effective digital integration and sustained managerial support. Investments in digital systems are more likely to generate value when information and technologies are integrated across organizational functions and supported by managers who encourage digital initiatives and allocate appropriate resources.

Second, SMEs should place particular emphasis on developing organizational agility. The results indicate that DTC has its strongest effect on organizational agility, while agility subsequently contributes substantially to both firm performance and organizational resilience. Managers can strengthen agility by improving real-time information sharing, shortening decision-making processes, increasing cross-functional coordination, and allowing resources to be reallocated quickly when market conditions change. This is particularly important for organizational resilience because the direct effect of DTC on resilience is relatively small, whereas its indirect effect through agility is considerably stronger. Therefore, SMEs seeking to become more resilient should combine digital investment with organizational practices that enable rapid and flexible responses to disruptions.

7. CONCLUSION

This study examines how digital transformation capability (DTC) contributes to firm performance and organizational resilience through the mediating role of organizational agility in Vietnamese SMEs. By conceptualizing DTC as a higher-order capability formed by technological infrastructure, digital integration, and managerial support, the study highlights that digital transformation extends beyond the adoption of digital technologies and requires the coordinated development of technological and organizational resources. The findings show that DTC is significantly and positively associated with organizational agility, firm performance, and organizational resilience. Organizational agility also positively affects both outcomes and significantly mediates the relationships between DTC and firm performance and between DTC and organizational resilience. In particular, the relatively stronger indirect effect on organizational resilience indicates that the benefits of digital transformation are more fully realized when digital capabilities are converted into rapid and flexible organizational responses. Overall, the results support a capability-conversion perspective in which DTC provides the foundation for digital value creation, while organizational agility enables firms to transform this capability into performance and adaptive outcomes.

Despite these contributions, several limitations should be acknowledged. First, the study employs a cross-sectional research design, which limits the ability to establish causal relationships and capture how digital transformation capability, agility, and organizational outcomes evolve over time. Second, the data are based on self-reported responses from managers, which may introduce perceptual bias and common method concerns, particularly for subjective measures of firm performance and resilience. Third, the use of purposive sampling and the focus on Vietnamese SMEs may limit the generalizability of the findings to larger firms or organizations operating in different institutional and economic environments. Finally, although the model explains a meaningful proportion of the variance in firm performance and organizational resilience, other organizational and environmental factors may also influence these outcomes.

Future research could address these limitations by employing longitudinal or panel designs to examine the dynamic development of digital transformation capabilities and their longer-term organizational effects. Researchers could also combine perceptual measures with objective indicators of financial, operational, or resilience performance to strengthen the robustness of the findings. Comparative studies across countries, industries, and firm sizes would help determine whether the proposed relationships remain consistent under different institutional and

competitive conditions. In addition, future studies could extend the model by examining contextual factors such as environmental dynamism, technological turbulence, organizational culture, leadership, or resource orchestration as moderators. Other mediating mechanisms, including innovation capability, organizational learning, or ambidexterity, may also be investigated to provide a more comprehensive explanation of how digital transformation generates sustainable organizational value.

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