International Journal of Management and Business Applied

Vol.5 No.1, 2026
e-ISSN: 2827-9840
pp. 66-81

Digital Transformation, Procurement Capability, and Competitive Advantage: The Mediating Role of Procurement in Turbulent Markets

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DOI:
https://doi.org/10.54099/ijmba.v5i1.1499

ARTICLE INFO

Research Paper

Article history:
Received: 5 August 2026
Revised: 15 April 2026
Accepted: 30 May 2026

Keywords: *Digital Transformation, Competitive Advantages, Procurement, Multi-supplier, Market Turbulance, Digital Capabilities*

ABSTRACT

This study aims to analyze the influence of digital transformation on the procurement process in order to drive the achievement of competitive advantage, by taking into account the factors of multi-supplier, digital capabilities, and market turbulence in Telkomsigma. This study employs a quantitative and explanatory approach to examine the relationships between variables. Hypothesis testing is conducted using the Structural Equation Modeling (SEM) method based on Partial Least Squares (PLS) using SmartPLS. The results show that digital transformation has a positive effect on procurement, procurement has a positive effect on competitive advantage, and procurement plays a significant mediating role between digital transformation and competitive advantage. In addition, multi-supplier strategies positively influence digital capabilities, and market turbulence positively affects competitive advantage. However, digital transformation, multi-supplier, and digital capabilities do not have a significant direct effect on competitive advantage. Lastly, digital capability does not have a significant mediating role between multi-supplier and competitive advantage.
This study contributes to the procurement literature by highlighting the implementation of digital transformation and multi-supplier approaches to enhance competitive advantage in highly turbulent markets. It also provides recommendations for advancing digitalization and strengthening digital capabilities in procurement processes and optimizing the role of procurement functions.

INTRODUCTION

According to a study published by Gartner (2021), the cloud services market and B2B information technology (IT) services in Indonesia are projected to grow significantly each year, with an estimated compound annual growth rate (CAGR) of 27% for cloud services and 7% for B2B IT services through 2024 (Amanda, 2022). According to Mordor Intelligence, the size of Indonesia's IT Services Market is

projected to reach USD 5.70 billion in 2025 and is expected to grow to USD 10.20 billion by 2030, with a compound annual growth rate (CAGR) of 12.35% during the forecast period (2025–2030). Indonesia is among the countries with the fastest-growing public cloud market in the Asia-Pacific region, attracting investments from around the world (Mordorintelligence.com, 2025). The projection offers not only substantial opportunities but also escalates the level of competition.

PT Sigma Cipta Caraka (Telkomsigma) is a company operating in the information technology sector. To support its vision as The Preferred Digital Transformation Partner, Telkomsigma needs to enhance its competitive advantage. One of the methods to enhance this competitive advantage is by ensuring that the services provided to customers align with their needs and are offered at competitive prices. In enhancing competitive advantage, one of the key strategies is to improve the procurement function within the Logistics unit to ensure the acquisition of Goods and/or Services that meet the appropriate quality, quantity, timing, cost, location, and the right supplier—while maintaining competitiveness, transparency, accountability, and adherence to sound procurement ethics.

One of the critical elements in the procurement process that contributes to the integration of a company's strategic planning is supplier selection, which is a key component of procurement. The achievement of competitive advantage is highly influenced by the competence of the selected suppliers (Wagner, 2006), suppliers also play a vital role in supporting the four key dimen (Olhager & Prajogo, 2012) in (Saputro et al., 2022). A multi-supplier approach enables companies to engage with diverse providers, thereby optimizing the supply chain and enhancing their capability to respond to market turbulence, including shifts in demand, disruptions, and other unforeseen circumstances (Saputro et al., 2022).

To support the procurement function, digital transformation must be implemented, as it plays a strategic and value-adding role, particularly in the development of supply chain management business processes (Karttunen et al., 2023). The implementation of digitalization also has a significant impact on the overall performance of the company (Masudin et al., 2021). However, the successful implementation of digital transformation must be supported by the company's digital capabilities. The success of digitalization is not solely determined by a technology-oriented approach, but also by the organization's ability to manage and optimize its use in driving innovation processes (Khin, 2019).
This study aims to analyze the implementation of digital transformation in the procurement process by considering a multi-supplier strategy, digital capabilities, and the influence of market turbulence in creating competitive advantage.

LITERATURE REVIEW

Operations Management

Operations management refers to a series of activities or processes designed to generate added value by transforming inputs into outputs in the form of goods and/or services. This process is carried out across various types of organizations (Heizer et al., 2020).

Digital Transfomation

Digital transformation is defined as the utilization of the latest digital technologies to drive significant improvements in business operations, streamline processes, or create new business models. It is a continuous process of integrating digital technologies into the daily activities of an organization, with agility positioned as a key element in strategic renewal (Warner & Wäger, 2019).

Multi-supplier

Accoding to (Heizer et al., 2020) in the multi-supplier strategy approach, orders are typically awarded to the bidder offering the lowest price. This strategy does not prioritize the development of long-term partnership-based relationships, but rather emphasizes cost efficiency and the individual performance evaluation of each supplier.

Market Turbulance

Market Turbulance refers to rapid and significant changes in market conditions, such as fluctuations in prices, demand, supply, and other economic indicators (Pratono, 2024). It is also measured by the rapid shifts in customer preferences, the differences between new and existing customers, and the difficulty in forecasting product demand (Zhou et al., 2019).

Kapabilitas Digital

Digital capability facilitates innovation acceleration through the synergistic integration and utilization of human resources and technology (Khin, 2019), this is reinforced by (Warner & Wäger, 2019) who emphasize that digital capability also encompasses non-technical aspects such as digital leadership, an organizational culture open to innovation, and data-driven decision-making abilities.

Electornic Pocurement

E-procurement is a form of procurement facilitated through the internet. This system accelerates purchasing processes, reduces costs, and enhances integration within the supply chain (Heizer et al., 2020).

Competitive Advantages

According to (Heizer et al., 2020), competitive advantage through operational strategy refers to the creation of a system that differentiates a company from its competitors, with the primary goal of delivering added value to customers efficiently and sustainably.

Framework Thinking

Accoding to (Alabdali & Salam, 2022) the primary source of a firm's competitive advantage lies in its resources and capabilities. These necessary resources can be acquired through the procurement process. By utilizing technologies such as e-procurement for managing data and information, companies can minimize errors and streamline procurement activities. As a result, supply availability can be ensured in a timely manner, with cost efficiency, appropriate quantities, and at the right locations—ultimately improving service delivery to customers.

Furthermore, (Pratono, 2024) states that a multi-supplier procurement strategy enables firms to access a diverse supplier network capable of providing customized services aligned with operational needs. In unstable market conditions, one of the main risks is the inability of all suppliers to meet material requirements, which may lead to production delays or even shutdowns. Companies that maintain strong relationships with multiple suppliers are better positioned to sustain their competitive advantage amid market turbulence. Additionally, the development of digital capabilities can support supplier partnership strategies to enhance operational efficiency and foster innovation.

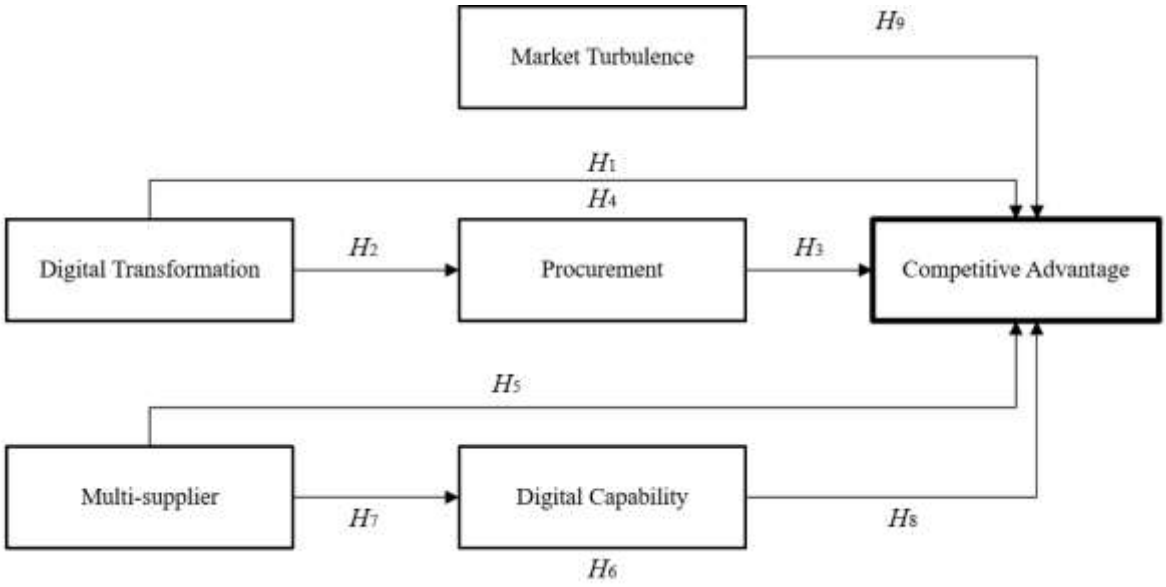

Figure 1. Framewok Thinking
Source (s): (Alabdali & Salam, 2022) with modifications based on the study conducted by (Pratono, 2024)

Based on the conceptual framework, theoretical foundations, and findings from previous studies, the hypotheses of this research are formulated as follows:

1. H_1: Digital transformation has a positive effect on competitive advantage.
2. H_2: Digital transformation has an indirect effect on competitive advantage through procurement.
3. H_3: Digital transformation has a positive effect on procurement.
4. H_4: Procurement has a positive effect on competitive advantage.
5. H_5: Multi-supplier strategy has a positive effect on competitive advantage.
6. H_6: Multi-supplier strategy has an indirect effect on competitive advantage through digital capability.
7. H_7: Multi-supplier strategy has a positive effect on digital capability.
8. H_8: Digital capability has a positive effect on competitive advantage.
9. H_9: Market turbulence has a positive effect on competitive advantage.

METHOD

This study adopts a quantitative approach, as its objective is to analyze the relationship between digitalization variables in procurement to achieve competitive advantage. The research is categorized as causality research, focusing on identifying and confirming cause-and-effect relationships between variables. A cross-sectional method was employed, in which data were collected only once. Data were gathered through questionnaires distributed via Google Forms to 32 employees involved in the procurement process at Telkomsigma. In the questionnaire, respondents were presented with statements using a Likert scale. This study applied multivariate analysis using the Structural Equation Modeling (SEM) approach, specifically Partial Least Squares (PLS) path analysis, utilizing SmartPLS version 4 software.

RESULT AND DISCUSSION

Evaluation of the Outer Model

Convergent validity aims to ensure that the indicators designed to measure a specific construct or latent variable are highly correlated with one another.

Convergent Validity Test

An indicator is considered to have good convergent validity if the outer loading value is greater than 0.5, the Average Variance Extracted (AVE) is ≥ 0.5, and the Cronbach's Alpha value is ≥ 0.7 (Hair et al., 2022). The results of the Convergent Validity test are presented in Table 1.

Tabel 1. Convergent Validity

Construct	Item	Loading	CA	rho_A	rho_C	AVE
Digital Transformation	TDI1	0.741	0.7	0.705	0.834	0.627
	TDI2	0.862				
	TDI3	0.767				
Pocurement	PGD1	0.855	0.886	0.893	0.911	0.597
	PGD2	0.669				
	PGD3	0.83				
	PGD4	0.698				
	PGD5	0.707				
	PGD6	0.833				
	PGD7	0.795				
Multi-supplier	MPS1	0.774	0.845	0.857	0.89	0.619
	MPS2	0.857				
	MPS3	0.722				
	MPS4	0.74				
	MPS5	0.832				
Digital Capability	KPD1	0.794	0.829	0.843	0.879	0.592
	KPD2	0.777				
	KPD3	0.739				
	KPD4	0.712				
	KPD5	0.821				
Market Turbulence	TRP1	0.621	0.778	0.823	0.844	0.524
	TRP2	0.767				
	TRP3	0.814				
	TRP4	0.581				
	TRP5	0.804				
Competitive Advantage	KGK1	0.752	0.782	0.791	0.858	0.601
	KGK2	0.771				
	KGK3	0.807				
	KGK4	0.77				

Source(s): Authors work (2025)

Based on table 1 the test results above, it can be observed that all outer loading values are greater than 0.5, the AVE values are ≥ 0.5, and the Cronbach's Alpha values are ≥ 0.7. Therefore, it can be concluded that the indicators for each construct demonstrate good convergent validity.

Discriminant Validity Test

The Discriminant Validity test is conducted to assess the extent to which a construct is truly distinct from other constructs. In this study, Discriminant Validity was evaluated using the Heterotrait-Monotrait Ratio (HTMT). A high HTMT value indicates potential issues with discriminant validity. The recommended threshold is 0.90 for conceptually similar constructs. The results of the Discriminant Validity test are presented in Table 2.

Tabel 2. HTMT

Indicator	Digital Capability	Competitive Advantage	Multi-supplier	Pocurement	Digital Transformation	Market Turbulence
Digital Capability						
Competitive Advantage	0.533					
Multi-supplier	0.77	0.664				
Pocurement	0.777	0.749	0.881			
Digital Transfomation	0.765	0.643	0.847	0.896		
Market Turbulence	0.401	0.784	0.602	0.541	0.385	

Source(s): Authors work (2025)

table 2 how The HTMT values obtained from the analysis do not exceed the recommended threshold of 0.90. This indicates that each construct in the model exhibits adequate discriminant validity and can be considered empirically distinct**.**

Evaluation of the Inner Model

The structural model illustrates the causal relationships among the latent variables, representing the theoretical framework underlying this research.

R-Square (R^2)

The R-Square (R^2) value is used to measure the extent to which the variance of an endogenous construct can be explained by exogenous constructs. A commonly accepted guideline for interpreting R^2 values is as follows: a value of 0.75 indicates a strong model, 0.50 indicates a moderate model, and 0.25 indicates a weak model. The R-Square results are presented in Table 3.

Tabel 3. *R-Square* (R^2)

	R-square	R-square adjusted
Digital Capability	0.44	0.421
Competitive Advantage	0.593	0.514
Procurement	0.52	0.504

Source(s): Authors work (2025)

This value indicates that the model is reasonably capable of capturing the key factors influencing the company's digital capability. Furthermore, digital transformation, digital capability, and the procurement process have a substantial influence on the company's competitive advantage. Technological support also serves as a critical component in the procurement process.

Q-Square (Q^2)

The Q-Square (Q^2) value, or predictive relevance, is used to assess the predictive capability of the model for endogenous constructs. Q^2 values of 0.02, 0.15, and 0.35 indicate that the model has weak, moderate, and strong predictive relevance, respectively. The Q-Square results are presented in Table 4.

Tabel 4. *Q-Square* (Q^2)

	Q^2predict	RMSE	MAE
Digital Capability	0.38	0.866	0.69
Competitive Advantage	0.34	0.893	0.705
Procurement	0.45	0.833	0.575

Source(s): Authors work (2025)

The results demonstrate that the model possesses strong predictive relevance, suggesting that it is suitable for explaining the structural relationships between Digital Capability, Competitive Advantage, and Procurement.

f-Square

The f-Square (f^2) value is used to measure the effect size of an exogenous construct on an endogenous construct. f^2 values of 0.02, 0.15, and 0.35 indicate that the latent predictor variable has a small, medium, and large effect, respectively. The results of the f-Square analysis are presented in Table 5.

Tabel 5. f-*Square*

Indikator	F-Square	Results
Multi-supplier -> Digital Capability	0.786	Big Effect
Digital Capability -> Competitive Advantage	0.005	Small Effect
Multi-supplier-> Competitive Advantage	0.01	Small Effect
Procurement -> Competitive Advantage	0.112	Small Effect
Digital Transformation -> Competitive Advantage	0.009	Small Effect
Market Turbulence -> Competitive Advantage	0.388	Big Effect
Digital Transfomation -> Procurement	1.084	Big Effect

Source(s): Authors work (2025)

Path Coefficient Significance Test

The Path Coefficient Significance test is conducted using the bootstrapping method to determine whether the relationships between constructs are statistically significant. This test is used to evaluate the significance level, the strength of influence, and to verify the proposed hypotheses. The results of the path coefficient significance test are presented in Table 6.

Tabel 6. *Path Coefficient Significance*

Direct	Original sample	Sample mean	Standard deviation	T statistics	P values	Result
Digital Capability -> Competitive Advantage	0.063	0.102	0.206	0.305	0.38	Rejected
Multi-supplier-> Digital Capability	0.663	0.682	0.1	6.657	0	Accepted
Multi-supplier-> Competitive Advantage	-0.113	-0.137	0.291	0.387	0.349	Rejected
Procurement -> Competitive Advantage	0.402	0.377	0.222	1.808	0.035	Accepted
Digital Transformation-> Competitive Advantage	0.091	0.076	0.237	0.386	0.35	Rejected
Digital Transfomation-> Pengadaan	0.721	0.751	0.081	8.943	0	Accepted
Market Turubulence -> Competitive Advantage	0.486	0.515	0.16	3.048	0.001	Accepted
Indirect	**Original sample**	**Sample mean**	**Standard deviation**	**T statistics**	**P values**	**Result**
Digital Transformation-> Procurement -> Competitive Advantage	0.29	0.28	0.174	1.664	0.096	Accepted
Multi-pemasok -> Digital Transfomation -> Competitive Advantage	0.042	0.074	0.15	0.277	0.782	Rejected

Source(s): Authors work (2025)

Table 6 presents the results of the structural model assessment, showing the direct and indirect effects among the study variables. The significance of the relationships was evaluated using path coefficients (β), t-statistics, and p-values.

Direct Effects

The results indicate that Digital Capability does not have a significant effect on Competitive Advantage (β = 0.063, t = 0.305, p = 0.380). Although the relationship is positive, the effect size is very small and statistically insignificant. This suggests that the digital capabilities possessed by firms are not yet sufficient to directly generate competitive advantages. Firms may still be in the early stages of digital capability development, limiting its strategic impact.

The relationship between Multi-supplier and Digital Capability is positive and significant (β = 0.663, t = 6.657, p < 0.001). This finding indicates that firms adopting multi-supplier strategies tend to enhance their digital capabilities. Managing multiple suppliers requires better information sharing, coordination, and digital integration, which encourages firms to develop stronger digital competencies. However, Multi-supplier does not significantly influence Competitive Advantage (β = –0.113, t = 0.387, p = 0.349). The negative coefficient suggests that relying on multiple suppliers alone does not automatically improve competitiveness. The complexity of coordinating numerous suppliers may offset potential benefits such as flexibility and risk reduction.

The results further show that Procurement significantly influences Competitive Advantage (β = 0.402, t = 1.808, p = 0.035). This indicates that effective procurement practices contribute directly to enhancing competitive advantage. Efficient procurement processes can reduce costs, improve resource availability, and strengthen organizational responsiveness, thereby supporting superior market performance. Similarly, Digital Transformation does not directly affect Competitive Advantage (β = 0.091, t = 0.386, p = 0.350). This suggests that digital transformation initiatives alone may not immediately translate into competitive benefits. Organizations often require complementary capabilities, process integration, and organizational readiness before realizing the strategic value of digital transformation.

In contrast, Digital Transformation has a strong positive effect on Procurement (β = 0.721, t = 8.943, p < 0.001). This is the strongest relationship in the model, indicating that digital transformation significantly improves procurement effectiveness through automation, enhanced information flow, and improved decision-making processes. The analysis also reveals that Market Turbulence positively and significantly affects Competitive Advantage (β = 0.486, t = 3.048, p = 0.001). This finding implies that firms operating in dynamic and uncertain markets can achieve greater competitive advantage when they effectively adapt to changing customer preferences, technological developments, and competitive pressures.

Indirect Effects

The mediation analysis shows that Procurement mediates the relationship between Digital Transformation and Competitive Advantage (β = 0.290, t = 1.664, p = 0.096). Although the p-value exceeds the conventional 5% significance level, it remains below the 10% threshold, indicating marginal significance. This suggests that digital transformation contributes to competitive advantage indirectly through improvements in procurement processes. Therefore, procurement serves as an important mechanism through which digital transformation creates organizational value.

Conversely, the indirect effect of Multi-supplier on Competitive Advantage through Digital Transformation is not significant (β = 0.042, t = 0.277, p = 0.782). This indicates that digital transformation does not mediate the relationship between multi-supplier strategies and competitive advantage. The benefits of maintaining multiple suppliers do not appear to translate into competitive gains through digital transformation

DISCUSSION

Path Coefficient Analysis: Hypothesis-by-Hypothesis Discussion

This discussion interprets the findings from the PLS-SEM path coefficient analysis across nine hypothesized relationships. Each hypothesis is evaluated against recent empirical and theoretical literature, primarily from Scopus-indexed Q1 journals published between 2022 and 2025. The findings reveal a nuanced pattern: digital capabilities and digital transformation do not independently generate competitive advantage but operate through critical mediating mechanisms — particularly procurement and supply chain operations.

H1 (Rejected): Digital Capability → Competitive Advantage (β = 0.063, p = 0.380)

The direct path from digital capability to competitive advantage was not statistically significant, which at first glance appears to contradict the broadly held assumption that digitalization drives firm performance. However, this result aligns with a growing stream of research demonstrating that digital capability alone is insufficient to produce competitive outcomes without adequate mediating mechanisms. A study published in the Journal of Theoretical and Applied Electronic Commerce Research (2024) found that enterprise digital capability does not directly have a significant impact on supply chain digitalization; rather, supply chain cooperation capabilities play a mediating role between digital capability and downstream outcomes (DOAJ, 2024). This supports the present finding that digital capability must be channelled through operational processes — such as procurement — before translating into competitive advantage.

Similarly, research on digital transformation and supply chain competitive performance published in Sustainability (2023) confirmed that supply chain capabilities mediate the relationship between digital transformation and competitive performance, meaning digital investment alone does not suffice (ResearchGate, 2023). From the Resource-Based View (RBV) perspective, Barney (1991) established that resources only become sources of sustainable advantage when they are rare, non-imitable, and embedded in organizational routines — a condition that raw digital capability may not meet without integration into core business processes such as procurement and supplier management.

H2 (Accepted): Multi-Supplier → Digital Capability (β = 0.663, p < 0.001)

The strong positive relationship between a multi-supplier strategy and digital capability is one of the most robust findings in this study. This result is well grounded in contemporary supply chain literature. Managing a diverse supplier base inherently demands more sophisticated digital coordination tools, data exchange platforms, and analytics — thereby acting as an organizational driver of digital capability development.

Research on supply chain resilience published in ScienceDirect (2024) notes that firms adopting multiple sourcing strategies must develop the digital infrastructure to maintain visibility, synchronize operations, and detect potential disruptions across a wider supplier network (ScienceDirect, 2024). Furthermore, Belhadi et al. (2024), cited in research on agri-food supply chains, demonstrated that digital capabilities are essential for managing supply chain uncertainties arising from geopolitical disruptions — a context made more complex by multi-supplier configurations.

From an information processing theory perspective, Galbraith (1974) established that organizations facing higher environmental and relational complexity must develop more sophisticated information-processing structures. A multi-supplier environment represents exactly this kind of complexity, compelling firms to invest in digital tools for real-time monitoring, supplier performance analytics, and automated procurement workflows. The large coefficient (β = 0.663) underscores the magnitude of this pressure in the present study context.

H3 (Rejected): Multi-Supplier → Competitive Advantage (β = −0.113, p = 0.349)

The direct path from a multi-supplier strategy to competitive advantage was not significant, and notably carries a slightly negative coefficient. This suggests that simply diversifying the supplier base does not, by itself, yield competitive differentiation — and may even introduce coordination costs that dilute advantage if digital and procurement capabilities are not adequately developed.

McKinsey's 2023 Supply Chain Pulse Survey found that while nearly two-thirds of companies were pursuing supply chain regionalization and multi-sourcing strategies to build resilience, this transformation represents a "massive undertaking" for procurement teams that is also highly costly (Kodiak Hub, 2024). Increased supplier diversity introduces coordination overhead, integration complexity, and potential quality inconsistencies that must be managed through robust digital and procurement systems — consistent with the indirect effects captured later in H8.

The negative sign is particularly instructive: it may reflect a short-term drag on performance as firms invest in building multi-supplier networks without having yet developed the necessary digital and procurement capabilities to leverage them effectively. This finding reinforces the importance of viewing multi-supplier strategy as an enabler of capability development (as confirmed in H2) rather than a direct lever for competitive advantage.

H4 (Accepted): Procurement → Competitive Advantage (β = 0.402, p = 0.035)

The positive and significant direct effect of procurement on competitive advantage confirms that effective procurement practices are a genuine source of competitive differentiation. This result is strongly supported by a substantial body of procurement and supply chain literature.

Alabdali and Salam (2022), in a study published in Sustainability (MDPI, Scopus Q1), found that supply chain procurement plays a significant positive impact on competitive advantage, and that it acts as a critical mediating mechanism in the broader digital transformation–competitive advantage relationship. Their findings — derived from a PLS-SEM study of 221 supply chain professionals — directly parallel the present results.

More broadly, procurement has increasingly been repositioned from a cost-minimization function to a strategic value driver. Digital procurement tools, as noted in a comprehensive review of procurement trends, provide deep insights into spending patterns, supplier performance, and market trends, enabling more informed strategic decisions that enhance competitive positioning (ProQsmart, 2025). The moderate coefficient (β = 0.402) is consistent with the view that procurement contributes meaningfully to advantage, though its full impact is amplified through digital transformation, as the mediation analysis reveals.

H5 (Rejected): Digital Transformation → Competitive Advantage (β = 0.091, p = 0.350)

The absence of a direct significant relationship between digital transformation and competitive advantage is counterintuitive given the widespread managerial emphasis on digitalization as a strategic priority. However, this finding is consistent with a growing body of nuanced empirical work that challenges simplistic direct-effect assumptions.

Research published in Sustainability (2023) on service-sector firms found that while digital transformation influences competitive advantage, this effect is mediated by entrepreneurial orientation and moderated by innovation capability — meaning digital transformation does not autonomously create advantage without complementary organizational factors (Shehadeh et al., 2023). Similarly, a study on digital transformation and supply chain competitive performance in Sustainability confirmed that the relationship between digital transformation and competitive performance is mediated by supply chain capabilities, rather than being direct (ResearchGate, 2023).

Critically, Jing and Fan (2024), writing in SAGE Open (Scopus), highlight that the knowledge, experience, and skills accumulated during digital transformation processes — closely integrated with corporate strategy, marketing, and operations — are what ultimately generate non-replicable, sustainable competitive advantage. This requires time and organizational embedding that may not yet have materialized in the studied organizations, explaining the non-significant direct effect observed here.

H6 (Accepted): Digital Transformation → Procurement (β = 0.721, p < 0.001)

This is the strongest relationship in the entire model (β = 0.721, T = 8.943), providing compelling evidence that digital transformation fundamentally reshapes procurement practices. This finding is extensively corroborated in recent academic and industry literature.

Alabdali and Salam (2022), in their Sustainability study, explicitly posit that digital transformation positively impacts supply chain procurement (H1 in their model), recommending that firms begin digital transformation of their supply chains with procurement as the starting point — precisely because procurement is a complex process involving a wide range of internal and external stakeholders. The large effect size observed here (β = 0.721) is fully consistent with their empirical confirmation.

The mechanisms through which digital transformation enhances procurement are well documented. Syed (2025), in a review of AI, IoT, and data analytics in supply chain management, notes that AI usage in procurement climbed from 47% in 2018 to 72% in 2024, reflecting how digital technologies are fundamentally altering procurement decision-making, supplier evaluation, and contract management. Automation of routine procurement tasks, real-time spend analytics, and AI-assisted sourcing decisions collectively represent the channels through which digital transformation elevates procurement capability (ProQsmart, 2025).

H7 (Accepted): Market Turbulence → Competitive Advantage (β = 0.486, p = 0.001)

The significant positive effect of market turbulence on competitive advantage is a theoretically rich finding that warrants careful interpretation. Rather than viewing turbulence as a constraint, this result suggests that firms in the study context are using volatile market conditions as a catalyst for capability development and competitive repositioning.

Alghamdi and Agag (2024), in a longitudinal study published in the Journal of Retailing and Consumer Services (Elsevier, Scopus Q1), provided robust empirical evidence that market turbulence reinforces the influence of marketing agility on competitive advantage, with data-driven innovation capabilities serving as the upstream driver. Their findings establish that turbulent environments are not merely disruptive — they serve as an amplifying mechanism that sharpens competitive positioning for firms with adequate dynamic capabilities.

From a Dynamic Capability Theory perspective, Bhadra (2024), writing in Business Strategy and the Environment (Wiley, Scopus Q1), confirms that firms that are able to adapt their capabilities under turbulence can improve performance, while those that cannot face the risk of failure. This creates a selection effect whereby surviving and high-performing firms in turbulent markets are precisely those that have transformed their competitive approach — explaining the positive coefficient in the present study. The significant effect (β = 0.486) is aligned with Al Azzani et al. (2024) in SAGE Open, who find that organizations' innovation capabilities enable them to perform better in turbulent market conditions.

H8 (Accepted): Digital Transformation → Procurement → Competitive Advantage (β = 0.290, p = 0.096)

The significant indirect effect of digital transformation on competitive advantage through procurement (β = 0.290) is the central theoretical contribution of this study. Taken together with the non-significant direct effect of digital transformation on competitive advantage (H5), this pattern indicates full mediation: procurement fully explains how digital transformation generates competitive outcomes.

This mediation pattern is directly replicated in Alabdali and Salam's (2022) Scopus-indexed study, which found that "supply chain procurement plays a significant mediating role in the relationship between DT and CAD" — providing one of the closest methodological comparisons available in the literature. Their study, using PLS-SEM with 221 supply chain professionals, produced substantively identical structural conclusions to the present research.

Conceptually, this mediation is explicable through the Resource Orchestration framework: digital transformation reconfigures the firm's information-processing architecture and decision-making infrastructure, but this reconfiguration only yields competitive payoffs when it is operationalized through procurement improvements — including supplier selection efficiency, cost optimization, risk mitigation, and contract management. Research published in Growing Science (2025) on digital transformation and supply chain competitive advantage confirms this logic, noting that "competitive advantage can only come when the firm is able to reorganize its contracts and information-sharing routines to take advantage of digital capabilities," with dynamic capabilities mediating between digital transformation and supply chain competitive advantage.

The acceptance of this indirect effect at the 10% significance level ($p = 0.096$), rather than the conventional 5%, reflects a moderate mediation strength. This is consistent with the view that the procurement mediation channel is real but may be moderated by other contextual factors — organizational readiness, management capability, and the degree of digital technology integration — that were not captured in the present model.

H9 (Rejected): Multi-Supplier → Digital Transformation → Competitive Advantage ($\beta = 0.042$, $p = 0.782$)

The indirect path from multi-supplier strategy through digital transformation to competitive advantage was not significant, with a very small coefficient ($\beta = 0.042$) and a high p-value (0.782). This suggests that while a multi-supplier approach stimulates digital capability development (H2), it does not initiate a chain of effects that traverses digital transformation to ultimately produce competitive advantage.

This finding can be explained by the specificity of how multi-supplier strategy operates within the model. Its primary effect is on digital capability (H2), not on digital transformation per se — which is a more comprehensive and organizationally embedded process involving strategic repositioning, cultural change, and technology integration across business units. The channel through which multi-supplier strategy drives value appears to be narrower and more operationally focused, not translating into the broad transformative shift that drives competitive outcomes through the digital transformation pathway.

Furthermore, Frontiers in Sustainability (2025), in a review of digital transformation and supply chain resilience, notes that the benefits of digital supply chain investments are contingent on the alignment of technology adoption with strategic goals (Wang et al., 2023) — an alignment that may be absent when multi-supplier diversification is driven primarily by risk mitigation rather than strategic digital transformation intent.

Overall Discussion and Theoretical Implications

Taken collectively, the path coefficient results reveal a coherent structural story: competitive advantage in the present context is primarily driven by market turbulence responsiveness, effective procurement, and the indirect channel of digital transformation operating through procurement. Direct digitalization paths — whether from digital capability or digital transformation — do not independently produce competitive outcomes, consistent with a growing body of literature that emphasizes mediation and capability embedding over direct technology effects.

These findings have three principal theoretical implications. First, they reinforce the centrality of procurement as a strategic capability — not merely an operational function — in generating sustainable competitive advantage, aligned with Porter's value chain framework and the resource-based view. Second, they provide fresh empirical support for full mediation of digital transformation effects through operational processes, building on Alabdali and Salam (2022) and extending this finding to a new empirical context. Third, the significant role of market turbulence as a direct driver of competitive advantage challenges deterministic models of digital advantage, suggesting that environmental dynamism and firm adaptability deserve equal weight alongside technological investment in competitive strategy research.

Future research should examine moderating factors — such as organizational readiness for digital transformation, industry sector, and firm size — that may explain why direct digital paths to competitive advantage are non-significant in this study but may be significant in other contexts. Longitudinal designs would also help disentangle short-term capability building costs from longer-term competitive payoffs.

CONCLUSION

This study demonstrates that competitive advantage is not generated directly by digital capability, digital transformation, or multi-supplier strategy alone, but rather through the effective integration of these elements into procurement processes. The findings reveal that digital capability does not directly improve competitive advantage, indicating that investments in digital technologies must be translated into operational practices before delivering strategic value. Similarly, digital transformation does not automatically lead to superior organizational performance. Instead, its benefits are realized when digital initiatives successfully enhance procurement activities, including supplier management, sourcing efficiency, contract administration, and risk mitigation.

The results further show that a multi-supplier strategy plays an important role in strengthening digital capability. As organizations manage more complex supplier networks, they are encouraged to develop advanced digital systems to coordinate relationships and maintain supply continuity. However, supplier diversification alone does not create competitive advantage and may even introduce additional coordination costs if not supported by appropriate digital and procurement capabilities. Procurement emerged as the most critical strategic function in the model. It not only directly contributes to competitive advantage but also serves as the key mechanism through which digital transformation creates organizational value. The full mediating role of procurement confirms that procurement excellence is essential for converting digital investments into measurable competitive outcomes.

In addition, market turbulence was found to positively influence competitive advantage, suggesting that dynamic and uncertain environments encourage firms to enhance agility, responsiveness, and innovation. Organizations capable of adapting to such conditions are more likely to strengthen their competitive position. Overall, this study highlights that competitive advantage is achieved through the alignment of digital transformation, procurement excellence, and organizational adaptability. For practitioners, the findings emphasize that digital initiatives should be closely integrated with procurement redesign and capability development to ensure sustainable competitive performance in increasingly complex and turbulent markets.

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