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Building Supply Chain Resilience through Market Orientation: The Mediating Role of Process Improvement, Digital Transformation, and Efficiency in Enhancing Performance

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ABSTRACT

This study examines how market orientation enhances organizational performance through the mediating roles of process improvement, digital transformation, supply chain efficiency, and supply chain resilience, as well as the moderating role of organizational agility. The study seeks to explain how strategic orientation can be transformed into operational and adaptive capabilities that strengthen competitiveness in turbulent environments. A quantitative survey of 384 managers from manufacturing and service firms was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The research framework integrates the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT) to capture multi-stage mediation and moderation effects. The findings indicate that market orientation significantly drives process improvement and digital transformation, which enhance supply chain efficiency. Supply chain efficiency, in turn, strengthens supply chain resilience, ultimately improving organizational performance. Furthermore, organizational agility positively moderates the relationship between resilience and performance, highlighting the importance of adaptability and capability orchestration. From a managerial perspective, the results suggest that organizations should foster market orientation as a foundation for developing digital and process capabilities that build resilient and efficient supply chains, while investments in agility practices can further convert resilience into superior performance during disruptions. By integrating resilience and agility into the market orientation–performance relationship, this study offers a holistic and empirically validated framework that explains how firms can transform strategic intent into operational excellence and sustainable competitive advantage.

Keywords: Market Orientation; Digital Transformation; Global Supply Chain, Performance.

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INTRODUCTION

Organizations today face escalating pressures arising from digital disruption, volatile markets, supply chain shocks, and changing customer expectations. These conditions have intensified the need for firms to enhance both operational efficiency and adaptive capacity to maintain continuity and competitiveness. Industry reports (e.g., BCI, McKinsey, Deloitte) document rising supply chain vulnerabilities, emphasizing resilience and agility as strategic priorities (Kohli & Jaworski, 1990; Morgan, Whitler, Feng, & Chari, 2019; Narver & Slater, 1990).

At the same time, academic research has long recognized market orientation (MO) as a strategic asset that enables firms to sense customer needs, monitor competitors, and anticipate environmental shifts (Jaworski & Kohli, 1993; Kirca, Jayachandran, & Bearden, 2005). However, translating market intelligence into superior performance depends on internal capabilities that operationalize this knowledge. Process improvement (PI) and digital transformation (DT) serve as essential mechanisms that convert strategic intent into efficient and adaptive supply chain operations. Despite the importance of these capabilities, limited research has investigated how they collectively translate MO into resilience and performance, especially under dynamic environmental conditions (Bhatti, Hussain, Khan, Sultan, & Ferraris, 2024; Yu, Jacobs, Chavez, & Feng, 2019).

The emerging literature on supply chain resilience emphasizes that firms must move beyond efficiency and lean practices to develop adaptive and robust networks capable of absorbing disruptions and maintaining service levels (Tukamuhabwa, Stevenson, Busby, & Zorzini, 2015; Yarkarami, 2025). While efficiency remains vital for competitiveness, resilience has become equally crucial for long term survival. Yet, there is limited empirical research linking market orientation to resilience through process improvement, digital transformation, and supply chain efficiency. This study addresses this gap by proposing and testing a multi-stage model that connects these constructs through mediating and moderating mechanisms.

Furthermore, as organizations navigate volatile environments, organizational agility the ability to rapidly reconfigure resources and strategies becomes a dynamic capability that enhances the resilience performance relationship (Zhao, Hong, & Lau, 2023). Agile firms can leverage digital tools and process innovation to adapt their operations and strategies in real time, thereby maximizing performance outcomes even during crises. Thus, this study argues that agility not only complements resilience but also strengthens its positive influence on performance.

The present research integrates three theoretical lenses: the Resource Based View (RBV), Dynamic Capabilities Theory (DCT), and Contingency Theory. The RBV explains how tangible and intangible resources such as market intelligence, digital assets, and innovative processes contribute to sustained competitive advantage (Barney, 1991; Grant, 1996). DCT extends this perspective by emphasizing the ability of firms to sense opportunities, seize them through process and digital initiatives, and reconfigure resources to adapt to change (Eisenhardt & Martin, 2017; Teece, Pisano, & Shuen, 1997). Finally, Contingency Theory underscores that organizational effectiveness depends on aligning strategic orientation and internal capabilities with environmental conditions (Donaldson, 2001). Together, these frameworks provide a robust foundation for

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understanding how market-oriented firms develop capabilities that foster both efficiency and resilience.

Recent studies have begun examining the relationship between digital transformation and supply chain resilience. For example, Yuan, Tan, and Liu (2024) show that digital transformation enables supply chains to reconfigure resources and recover from disruptions, while Zhao et al. (2023) demonstrate a multi mediation effect linking digitalization to resilience and performance. However, these studies do not integrate market orientation with process and digital capabilities, nor do they examine agility as a boundary condition. Thus, a comprehensive capability chain connecting MO, PI/DT, SCE, SCR and OP remain theoretically underdeveloped.

1.1 Research gap and contribution

Although prior studies have examined the roles of market orientation, digital transformation, supply chain efficiency, and supply chain resilience (Kabra, 2023; Sheffi, 2021), the existing literature remains fragmented in several important ways. Most studies investigate these constructs separately or through limited direct relationships, without explaining how firms convert strategic orientation into operational and adaptive supply chain capabilities. While market orientation has been widely linked to firm performance, relatively limited attention has been given to the mechanisms through which market intelligence is translated into internal operational improvements and digital transformation initiatives that ultimately strengthen supply chain resilience.

Furthermore, existing research often treats supply chain efficiency and supply chain resilience as independent outcomes rather than examining their sequential relationship. This leaves an important gap in understanding how internal process capabilities and digital technologies contribute to operational efficiency and how efficiency can support the development of resilience in turbulent supply chain environments.

To address these gaps, this study develops and empirically tests an integrated capability framework in which market orientation stimulates both process improvement and digital transformation. These capabilities enhance supply chain efficiency, which subsequently contributes to the development of supply chain resilience and ultimately improves organizational performance. In addition, the study introduces organizational agility as a moderating capability that strengthens the relationship between resilience and performance. By integrating these constructs into a single empirical model, this study offers a more comprehensive explanation of how firms transform strategic orientation into operational excellence and adaptive capability under conditions of environmental turbulence.

2. Literature Review and Hypothesis Development

2.1 Market Orientation and Organizational Capabilities

Market orientation (MO) has long been recognized as a central driver of firm performance through its influence on innovation, responsiveness, and strategic alignment. According to (Kohli & Jaworski, 1990; Narver & Slater, 1990), market orientation reflects an organization's ability to generate, disseminate, and respond to market intelligence. Firms with strong market orientation

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continuously monitor customer preferences, competitor strategies, and environmental shifts, allowing them to identify emerging opportunities and threats.
However, market orientation alone is not sufficient for achieving superior performance it must be operationalized through specific organizational capabilities such as process improvement and digital transformation. These capabilities act as transformation mechanisms that convert market knowledge into operational excellence (Jaworski & Kohli, 1993; Kirca et al., 2005).
H1: Market orientation positively influences process improvement.
H2: Market orientation positively influences digital transformation.

2.2 Process Improvement and Supply Chain Efficiency

Process improvement involves systematic efforts to enhance operational workflows, eliminate inefficiencies, and achieve cost and quality advantages (Davenport, 1998; Hammer & Champy, 1993). In the context of supply chains, process improvement facilitates information sharing, reduces lead times, and enhances coordination across partners (Flynn, Huo, & Zhao, 2010). These outcomes contribute to supply chain efficiency, a critical performance dimension that ensures the optimal use of resources and capabilities (Negi, 2021).
Efficient supply chains rely on standardized processes and real time data flows that align with continuous improvement principles. Therefore, organizations that invest in process improvement initiatives tend to experience higher levels of supply chain efficiency.
H3: Process improvement positively influences supply chain efficiency.

2.3 Digital Transformation and Supply Chain Efficiency

Digital transformation (DT) represents the strategic adoption of digital technologies such as IoT, AI, and big data analytics to improve operational and strategic outcomes (Negi, 2021). In supply chain contexts, DT enables enhanced visibility, predictive analytics, and integration, which together strengthen supply chain efficiency and responsiveness (Dubey et al., 2020; MacKenzie, Colazo, & Scherer, 2025; Randall, Morgan, & Morton, 2003; Vial, 2021; Wamba, Bawack, Guthrie, Queiroz, & Carillo, 2021).
Market-oriented firms that leverage digital tools are better positioned to sense environmental shifts and rapidly align supply chain processes to meet customer needs. This is consistent with findings by Yuan et al. (2024) and Zhao et al. (2023), who identify digitalization as a foundational enabler of resilience pathways, although their models do not incorporate market orientation or agility. Therefore, digital transformation acts as a dynamic capability that fosters efficiency and innovation.
H4: Digital transformation positively influences supply chain efficiency.

2.4 Supply Chain Efficiency and Supply Chain Resilience

While supply chain efficiency has traditionally been linked to performance, recent global disruptions such as the COVID-19 pandemic have highlighted the limitations of efficiency focused models. Efficiency alone does not guarantee survival during crises; firms must also develop resilience, defined as the ability to anticipate, absorb, and recover from disruptions (Juan, Li, & Hung, 2022; Zhao et al., 2023).

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An efficient supply chain provides the foundation for resilience by enabling real time visibility, standardized processes, and quick reallocation of resources during disruptions (Chopra, Sodhi, & Lücker, 2021). Thus, supply chain efficiency can be viewed as a necessary precursor to resilience. The current model extends recent evidence from Zhao et al. (2023) by showing that efficiency is a precursor to resilience when driven by market-oriented and digitally enabled processes.

However, the relationship between supply chain efficiency and resilience has been debated in the literature due to what is often referred to as the efficiency–resilience paradox. Highly lean and optimized supply chains may reduce buffers, redundancy, and slack resources, which can increase vulnerability to disruptions. From this perspective, excessive efficiency may weaken a firm's ability to absorb shocks. At the same time, more recent research suggests that certain forms of efficiency particularly those supported by standardized processes, improved coordination routines, and digital visibility can strengthen resilience. Efficient processes supported by digital technologies enable faster information flows, improved resource allocation, and quicker response to disruptions. In this sense, efficiency does not simply represent cost reduction but also reflects improved operational discipline and coordination that can facilitate recovery and adaptation during supply chain disruptions.

Accordingly, when supply chain efficiency is developed through process improvement and digital transformation, it can enhance the transparency, responsiveness, and coordination capabilities that support resilience. Firms that operate efficient and digitally integrated supply chains are therefore better positioned to detect disruptions early, adjust operations quickly, and maintain continuity under uncertainty.

H5: Supply chain efficiency positively influences supply chain resilience.

2.5 Supply Chain Resilience and Organizational Performance

Supply chain resilience (SCR) contributes directly to organizational performance by maintaining continuity of operations, customer satisfaction, and brand reputation under uncertainty (Lin, Kunnathur, & Forrest, 2022; Ochieng, 2018; Singh, Soni, & Badhotiya, 2019). Resilient supply chains enable firms to recover faster from disruptions, adapt to market shocks, and sustain long term competitiveness.

Empirical studies suggest that resilience enhances both financial and non-financial performance by reducing losses, improving adaptability, and increasing stakeholder confidence (Chowdhury, Quaddus, & Agarwal, 2019; Hamidu, Boachie-Mensah, & Issau, 2023).

H6: Supply chain resilience positively influences organizational performance.

2.6 Moderating Role of Organizational Agility

Organizational agility (OA) represents a firm’s capability to quickly sense and respond to environmental changes through flexible structures, empowered decision making, and adaptive learning (Alyasein, Ojha, & Sadeghi, 2025; Fayezi, Zutshi, & O'Loughlin, 2017). While resilience ensures survival, agility ensures competitive advantage by enabling firms to exploit post crisis opportunities.

Agility strengthens the relationship between resilience and performance because agile firms can better capitalize on the benefits of resilience by not only recovering but also reconfiguring

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resources to outperform competitors (Dubey et al., 2022). Thus, when firms possess high agility, the positive impact of resilience on performance becomes more pronounced.
H7: Organizational agility positively moderates the relationship between supply chain resilience and organizational performance.

2.7 Direct Effect of Market Orientation on Performance

Although this study emphasizes the mediating mechanisms, prior research consistently confirms a direct link between market orientation and firm performance (Kirca et al., 2005; Morgan et al., 2019; Narver & Slater, 1990). Market-oriented firms tend to outperform competitors by delivering superior customer value, anticipating market trends, and fostering cross functional collaboration.
H8: Market orientation positively influences organizational performance.
The proposed conceptual model (see Figure 1) integrates the hypotheses discussed above. It positions Market Orientation as the initiating strategic capability that triggers Process Improvement and Digital Transformation, which in turn enhance Supply Chain Efficiency. Efficiency leads to Supply Chain Resilience, which mediates the relationship with Organizational Performance. Finally, Organizational Agility moderates the effect of resilience on performance and construct roles in the conceptual framework has been shown in table 1.

Table 1. Construct Roles in the Conceptual Framework

Construct	Type of Variable	Role in the Model	Theoretical Justification
Market Orientation (MO)	Independent (Exogenous) Variable	Drives process and digital capabilities; direct and indirect antecedent of performance	Resource-Based View (Barney, 1991); Dynamic Capabilities Theory
Process Improvement (PI)	Mediator 1	Translating MO into Supply-Chain Efficiency	Continuous improvement as transformation mechanism (Davenport, 1998; Flynn et al., 2010)
Digital Transformation (DT)	Mediator 2	Converts MO into technological and data-driven efficiency	Digital capability lens (Vial, 2021; Wamba et al., 2021)
Supply Chain Efficiency (SCE)	Mediator 3	Enhances Resilience through optimized operations	Efficiency–resilience link (Chopra et al., 2021)
Supply Chain Resilience (SCR)	Mediator 4	Connects efficiency to Organizational Performance	Resilience as dynamic capability (Ochieng, 2018)
Organizational Agility (OA)	**Moderator**	Strengthens SCR → Performance relationship	Agility as capability amplifier (Dubey et al., 2022)

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Organizational Performance (OP)	Dependent (Endogenous) Variable	Outcome of operational and adaptive capabilities	Performance outcomes (Kirca et al., 2005; Narver & Slater, 1990)

This framework reflects the Resource Based and Dynamic Capabilities perspectives, illustrating how firms can transform strategic orientation into operational and adaptive competencies that sustain performance under uncertainty summary of hypotheses (H1–H8) has been shown in table 2.

Table 2. Summary of Hypotheses (H1–H8)

Hypothesis	Statement	Expected Direction
H1	Market Orientation → Process Improvement	Positive
H2	Market Orientation → Digital Transformation	Positive
H3	Process Improvement → Supply Chain Efficiency	Positive
H4	Digital Transformation → Supply Chain Efficiency	Positive
H5	Supply Chain Efficiency → Supply Chain Resilience	Positive
H6	Supply Chain Resilience → Organizational Performance	Positive
H7	Organizational Agility moderates SCR → Performance	Positive moderation
H8	Market Orientation → Organizational Performance (direct)	Positive

Figure 1. illustrates the proposed relationships among market orientation, process improvement, digital transformation, supply chain efficiency, supply chain resilience, organizational agility, and organizational performance.

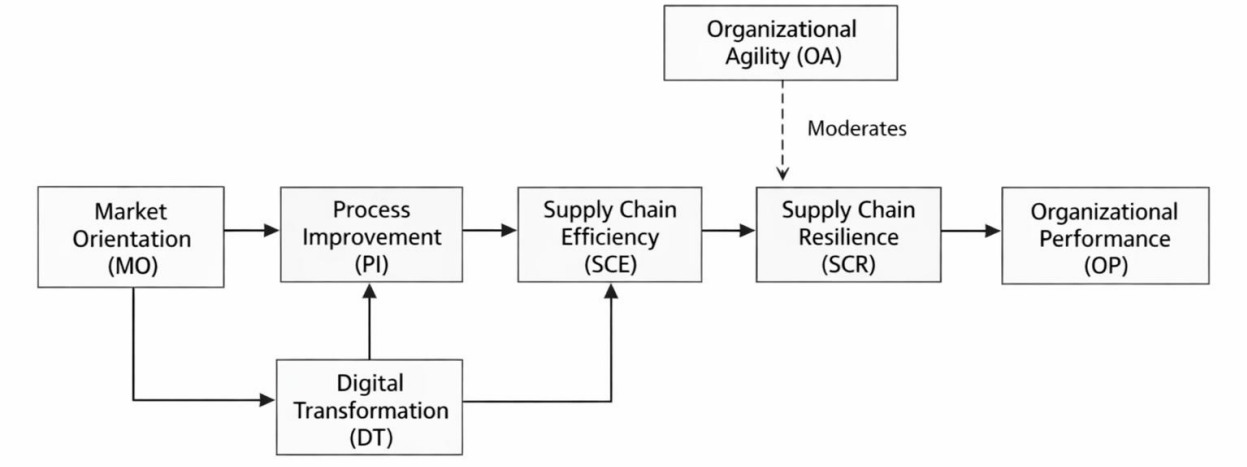

Figure 1. Conceptual Framework

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3. Research Methodology

3.1 Research Design

This study employs a quantitative, cross sectional research design to examine the mediating and moderating relationships proposed in the conceptual model. A structured questionnaire was developed based on validated measurement scales from prior studies, allowing statistical testing of the hypothesized relationships among market orientation, process improvement, digital transformation, supply chain efficiency, supply chain resilience, organizational agility, and organizational performance. The questionnaire has been presented in the Appendix A.

The study follows the positivist paradigm, seeking to explain causal relationships through empirical evidence and statistical modeling. The Structural Equation Modeling (SEM) approach was selected because it enables simultaneous estimation of multiple direct and indirect relationships and is consistent with previous studies in business and supply chain research ((Hair, Risher, Sarstedt, & Ringle, 2019).

3.2 Sampling and Data Collection

The target population comprised of senior managers, supply chain executives, and operations directors working in manufacturing and service organizations. These respondents were chosen because they possess strategic and operational knowledge relevant to the constructs under investigation. Data was collected through an online survey distributed via professional networks (LinkedIn, industry associations, and chamber of commerce mailing lists). A total of 415 responses were received, of which 384 were usable after screening for completeness and outliers an effective response rate of approximately 63 percent. A total of 1,250 managers were contacted via LinkedIn and professional associations. Of these, 415 responded (33.2% response rate), and 384 usable responses remained. A non-response bias test comparing early vs. late respondents revealed no significant mean differences (t-tests, $p > 0.05$), suggesting minimal non-response bias.

The sample represented diverse sectors including electronics (22%), automotive (18%), food and beverage (16%), pharmaceuticals (14%), logistics (12%), and retail (18%). Firm sizes ranged from small enterprises (< 100 employees, 28%) to large corporations (> 1,000 employees, 34%), ensuring heterogeneity for generalizability. After removing cases with more than 5% missing values, the remaining missing values (< 1%) were treated using the expectation maximization (EM) algorithm, which preserves the statistical properties of the dataset while minimizing bias.

Because the study relied on survey data collected from single respondents, several procedural and statistical remedies were employed to minimize the potential risk of common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Procedurally, respondents were assured of anonymity and confidentiality to reduce evaluation apprehension. In addition, questionnaire items from different constructs were intermingled and presented in randomized order to reduce the likelihood of response patterns or consistency bias.

Statistically, Harman's single-factor test was conducted and showed that the first unrotated factor accounted for 29% of the total variance, which is below the commonly suggested threshold of 50%. In addition, a full collinearity variance inflation factor (VIF) assessment was conducted, and all construct-level VIF values were below the conservative threshold of 3.3, suggesting that

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common method bias is unlikely to threaten the validity of the results. Taking together, these procedural and statistical checks indicate that common method bias does not represent a serious concern in this study.

Table 3. Data Screening Procedures

Screening Step	Method Applied	Decision Criteria	Outcome
Missing Data	Checked via descriptive statistics and frequency tables	Cases with > 5% missing removed	31 cases removed
Outliers	Mahalanobis distance ($p < 0.001$)	Extreme multivariate outliers excluded	7 responses removed
Normality	Skewness & Kurtosis (±2.0 range acceptable)	All indicators within range	Assumption satisfied
Common-Method Bias	Harman's single-factor test	First factor < 50% variance	29% → acceptable
Multicollinearity	VIF statistics	VIF < 3.0	No issue detected

3.3 Measurement of Variables

All constructs were measured using multi-item Likert scales (1 = strongly disagree to 5 = strongly agree) adapted from validated sources. However, construct, number of items, example item, and key sources has been shown in table 4.

All measurement items were pre-tested with five academic experts and ten industry managers to assess content validity, wording clarity, and relevance. Minor adjustments were made to fit the contemporary digital supply chain context. The full list of measurement items, their original sources, and standardized factor loadings are presented in Appendix A to enhance transparency and facilitate future replication.

Table 4. Construct and Sources

Construct	No. of Items	Example Item	Key Sources
Market Orientation (MO)	6	"Our firm frequently collects information about competitors' strategies."	(Kohli & Jaworski, 1990; Narver & Slater, 1990)
Process Improvement (PI)	4	"We regularly review and refine key operational processes to enhance efficiency."	(Davenport, 1998; Flynn et al., 2010)
Digital Transformation (DT)	5	"Digital technologies are integrated into core business and supply-chain activities."	(Vial, 2021; Wamba et al., 2021)

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Supply Chain Efficiency (SCE)	4	"Our supply-chain processes minimize waste and reduce lead time."	(Ketchen Jr & Hult, 2007)
Supply Chain Resilience (SCR)	5	"Our firm can quickly recover from unexpected supply-chain disruptions."	(Chowdhury et al., 2019; Ochieng, 2018)
Organizational Agility (OA)	4	"We can swiftly realign resources in response to sudden market changes."	(Dubey et al., 2022; Fayezi et al., 2017)
Organizational Performance (OP)	5	"Our firm's financial performance has exceeded competitors in the past three years."	(Ochieng, 2018; Singh et al., 2019)

3.4 Data Analysis Technique

Data were analyzed using SmartPLS 4.0, suitable for complex models with mediators and moderators (Hair et al., 2019). Partial Least Squares-SEM was preferred over covariance based SEM due to its flexibility with non-normal data, smaller sample size tolerance, and strong predictive orientation (Ringle, Da Silva, & Bido, 2015).

The analysis followed a two-step approach:

1. Measurement model evaluation, including internal consistency reliability, convergent validity, and discriminant validity.
2. Structural model testing, assessing path coefficients, mediating and moderating effects, and the model's explanatory power (R^2 and Q^2).

Bootstrapping with 5,000 resamples was applied to assess the significance of direct, indirect, and interaction effects.

3.5 Reliability and Validity

Cronbach's alpha (α) and Composite Reliability (CR) values exceeded 0.80 for all constructs, confirming internal consistency. The Average Variance Extracted (AVE) for each latent variable was above 0.50, demonstrating convergent validity (Fornell & Larcker, 1981).

Discriminant validity was confirmed via both the Fornell–Larcker criterion and the HTMT ratio (< 0.85). Multicollinearity was not an issue as all VIF values were below 3.0.

The model's overall fit (SRMR = 0.056) and predictive relevance ($Q^2 > 0$ for all endogenous variables) indicated robust explanatory capability.

3.6 Control Variables

Consistent with prior supply chain and organizational resilience research, firm size and global scope were included as control variables because both may influence supply chain resilience and organizational performance independently of the focal constructs in the model. Firm size may affect resilience and performance because larger firms typically possess greater resource slack, financial capacity, and technological infrastructure that can support disruption management and recovery capabilities. Larger organizations may also have more diversified supply bases and more

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formalized operational processes, which can enhance supply chain stability and performance outcomes.

Global scope was included as a control variable because firms operating across multiple countries face greater environmental complexity, supply chain interdependence, and exposure to geopolitical, regulatory, and logistical uncertainties. These factors may influence both resilience capabilities and organizational performance. Including these control variables helps ensure that the hypothesized relationships are not confounded by structural organizational characteristics.

3.7 Ethical Considerations

Participation was entirely voluntary. Respondents were informed of the purpose of research, data confidentiality, and their right to withdraw at any stage.

4. Results and Analysis

4.1 Measurement Model Assessment

The measurement model was evaluated for internal consistency, reliability, convergent validity, and discriminant validity following Hair et al. (2019). In Table 5 reliability and validity results has been shown. All factor loadings exceeded 0.70 ($p < 0.001$), confirming item reliability. Composite reliability (CR > 0.85) and AVE > 0.50 established strong convergent validity. Fornell–Larcker and HTMT criteria confirmed discriminant validity; no HTMT ratio exceeded 0.85. Collinearity diagnostics showed all VIF < 3.0, indicating no multicollinearity issues. These results confirm that all constructs exhibit sound psychometric properties suitable for hypothesis testing.

Table 5. Reliability and Validity Results

Construct	Cronbach's α	Composite Reliability (CR)	Average Variance Extracted (AVE)	AVE	HTMT (< 0.85)	VIF (< 3)
Market Orientation (MO)	0.88	0.91	0.63	0.79	0.67	2.10
Process Improvement (PI)	0.86	0.90	0.68	0.82	0.71	2.04
Digital Transformation (DT)	0.89	0.92	0.67	0.82	0.73	2.15
Supply Chain Efficiency (SCE)	0.84	0.88	0.61	0.78	0.70	2.08
Supply Chain Resilience (SCR)	0.90	0.93	0.69	0.83	0.75	2.18
Organizational Agility (OA)	0.87	0.91	0.72	0.85	0.69	2.05

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Organizational Performance (OP)	0.91	0.94	0.70	0.84	0.74	2.12

4.2 Structural Model Assessment

After validating the measurement model, the structural relationships were analyzed through Partial Least Squares Structural Equation Modeling (PLS-SEM) with 5,000 bootstrap samples. Model explanatory power was acceptable, with $R^2 = 0.61$ for Supply Chain Efficiency, $R^2 = 0.58$ for Supply Chain Resilience, and $R^2 = 0.64$ for Organizational Performance, indicating that the proposed variables jointly explain a substantial portion of variance in key outcomes. In Table 6 structural path coefficients and significance levels have been presented. All hypothesized paths were statistically significant, demonstrating strong support for the conceptual model.

Table 6. Structural Path Coefficients and Significance Levels

Path	β Coefficient	t-value	p-value	Supported	Effect Type
H1 MO → PI	0.38	7.25	< 0.001	✔	Direct
H2 MO → DT	0.42	8.11	< 0.001	✔	Direct
H3 PI → SCE	0.33	6.84	< 0.001	✔	Mediated
H4 DT → SCE	0.29	5.97	< 0.001	✔	Mediated
H5 SCE → SCR	0.47	9.02	< 0.001	✔	Mediated
H6 SCR → OP	0.40	7.88	< 0.001	✔	Mediated
H7 SCR×OA → OP	0.18	3.46	0.001	✔	Moderation
H8 MO → OP	0.21	4.12	< 0.001	✔	Direct

4.3 Mediation Analysis

The indirect effects were tested using the bootstrapping method (5,000 resamples). Results indicate that both *Process Improvement* and *Digital Transformation* significantly mediate the link between Market Orientation and Supply Chain Efficiency, while *Supply Chain Resilience* mediates the pathway between Efficiency and Organizational Performance. Indirect effects of mediation paths have been shown in table 7. The total indirect effect of Market Orientation on Organizational Performance ($\beta = 0.38$, $p < 0.001$) suggests that MO enhances performance primarily through capability building mechanisms confirming the mediating role of *resilience* within the extended chain which has been shown in table 7.

Table 7. Indirect Effects (Mediation Paths)

	β Coefficient	t-value	p-value	Type of Mediation
MO → PI → SCE	0.13	4.89	< 0.001	Partial
MO → DT → SCE	0.12	4.57	< 0.001	Partial

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SCE → SCR → OP	0.19	6.43	< 0.001	Full
MO → (PI, DT, SCE, SCR) → OP (Total Indirect Effect)	0.38	—	< 0.001	Sequential

4.4 Moderation Analysis

The moderating role of Organizational Agility (OA) on the *Supply Chain Resilience → Performance* link was tested using an interaction term (SCR × OA).

The interaction effect was significant ($\beta = 0.18$, $t = 3.46$, $p = 0.001$), indicating that agility amplifies the positive impact of resilience on performance.

A simple slope analysis showed that at high agility (+1 SD), the SCR → OP relationship ($\beta = 0.55$) was much stronger than at low agility (–1 SD; $\beta = 0.25$).

Figure 2 illustrates this moderating effect graphically, depicting a steeper slope for high agility firms. This result confirms that agility acts as a *dynamic enhancer*, enabling resilient firms to translate stability into competitive advantage.

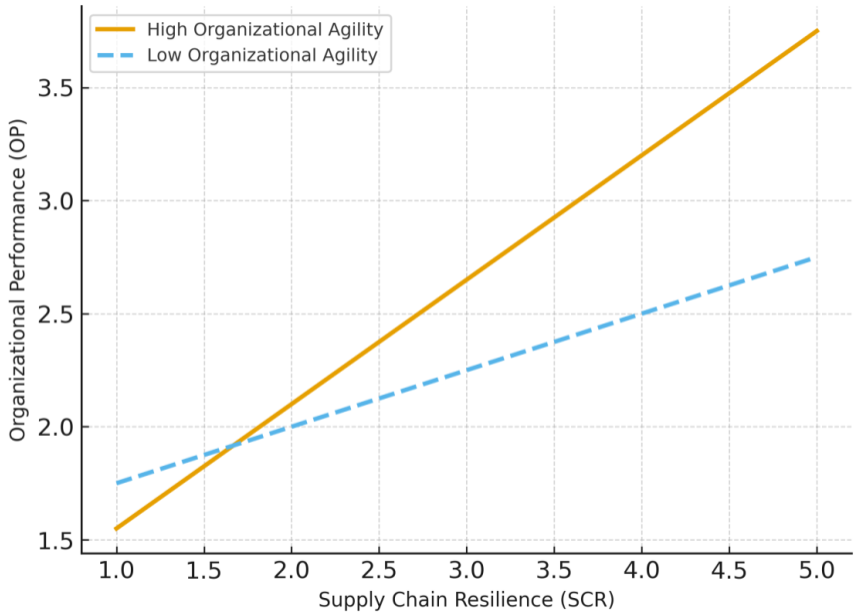

Figure 2. illustrates this moderating effect graphically, depicting a steeper slope for high-agility firms.

4.5 Model Predictive Relevance and Goodness of Fit

The model's predictive relevance was confirmed with $Q^2 > 0$ for all endogenous constructs (SCE = 0.41; SCR = 0.39; OP = 0.46), demonstrating strong out of sample predictive power (Stone-Geisser criterion). The Standardized Root Mean Square Residual (SRMR) = 0.056 < 0.08 and NFI = 0.91 confirmed overall model fit which has been shown in table 8.

Empirical evidence supports all eight hypotheses. Market orientation enhances process improvement and digital transformation, which strengthen supply chain efficiency. Efficiency

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fosters resilience, and resilience directly and indirectly drives performance. Moreover, organizational agility magnifies the effect of resilience on performance. Collectively, these results confirm that capability orchestration combining strategic orientation, process excellence, and adaptive agility is the cornerstone of superior organizational performance in dynamic environments. Table 8. Present the model fit and predictive relevance.

Table 8. Model Fit and Predictive Relevance

Model Fit Index	Value
R^2 (Supply Chain Efficiency)	0.61
R^2 (Supply Chain Resilience)	0.58
R^2 (Organizational Performance)	0.64
Q^2 (Supply Chain Efficiency)	0.41
Q^2 (Supply Chain Resilience)	0.39
Q^2 (Organizational Performance)	0.46
SRMR	0.056
NFI	0.91

5. Discussion

5.1 Interpretation of Key Findings

The findings of this study provide important insights into how strategic orientation is translated into operational and adaptive supply chain capabilities. Specifically, the results suggest that market orientation plays a foundational role in shaping internal capability development by stimulating both process improvement and digital transformation initiatives. These findings highlight that market-oriented firms do not simply collect and analyze external information but actively translate market knowledge into internal operational improvements and digital capability development. In doing so, market orientation functions as a sensing capability that triggers organizational responses aimed at improving operational effectiveness and responsiveness (Barney, 1991; Morgan et al., 2019).

The results also provide important insights into the relationship between supply chain efficiency and resilience. While previous literature has sometimes suggested a trade-off between lean efficiency and resilience, the findings indicate that efficiency developed through process improvement and digital transformation can support resilience by improving coordination, visibility, and response speed across the supply chain. In this sense, operational efficiency does not merely represent cost reduction but reflects improved process discipline and information integration that allow firms to detect disruptions earlier and respond more effectively. These findings contribute to the growing literature suggesting that digitally enabled operational capabilities can simultaneously support both efficiency and resilience objectives (Dubey et al., 2020; Wamba et al., 2021).

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Furthermore, the results highlight the critical role of organizational agility in strengthening the relationship between supply chain resilience and organizational performance. The moderating effect suggests that resilience alone may not automatically translate into superior performance outcomes unless firms possess the agility required to rapidly reconfigure resources and adjust operational activities in response to changing conditions. Organizational agility therefore acts as an enabling capability that amplifies the performance benefits of resilience by facilitating faster adaptation to environmental uncertainty (Chowdhury et al., 2019; Ochieng, 2018).

Finally, the significant moderating effect of organizational agility (OA) reveals that agility amplifies the benefits of resilience. High agility firms transform resilient operations into proactive competitive actions entering markets faster, customizing responses, and learning rapidly from disruptions. This aligns with the Dynamic Capabilities Theory (DCT), which posits that sensing, seizing, and reconfiguring resources drive superior adaptability and performance (Donaldson, 2001; Ketchen Jr & Hult, 2007).

The results collectively highlight that resilience is the pivotal capability in the pathway from efficiency to performance. This positioning of resilience as a central mediating mechanism advances the understanding of how firms convert operational excellence into adaptive advantage. Additionally, moderation by agility reinforces that resilience yields its maximum benefit only when firms possess the structural and strategic flexibility to exploit post disruption opportunities.

5.2 Theoretical Implications

The findings extend both MO and performance and resilience–performance research by demonstrating how operational and adaptive capabilities interact. Specifically, PI and DT act as lower order capabilities that feed into efficiency, while resilience represents a higher order dynamic capability contingent upon these foundations. This sequencing clarifies capability hierarchies and extends DCT's reconfiguration logic. This study offers several contributions to theory.

First, it bridges the gap between *strategic orientation* and *operational capabilities* by illustrating how market orientation fosters both process and digital capabilities that translate into efficiency and resilience. While prior research has often examined MO and performance directly, this study empirically unpacks the underlying mechanisms, supporting calls for a more granular understanding of capability pathways (Kirca et al., 2005; Morgan et al., 2019). This study advances contingency and dynamic capabilities perspectives by clarifying the sequential mechanism through which capabilities evolve. Specifically, supply chain efficiency enables firms to sense operational vulnerabilities and seize recovery pathways, which develop into resilience a reconfiguration capability. This sequential mediation demonstrates that resilience is not an isolated attribute, but an emergent capability built on process and digital foundations.

Second, the research integrates resilience within the RBV–DCT framework, extending both theories. From the RBV perspective, resilience is conceptualized as a higher order capability, a meta resource that combines flexibility, redundancy, and visibility. From the DCT viewpoint, resilience reflects the firm's ability to reconfigure and adapt under pressure. Thus, this study contributes to theory by showing that resilience operates as both an outcome of efficiency and a driver of performance.

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Third, by incorporating organizational agility as a moderator, the model expands the understanding of how dynamic capabilities interact. Rather than functioning independently, agility strengthens the effect of resilience, revealing a synergistic relationship among adaptive capabilities. This aligns with emerging perspectives that view agility and resilience as mutually reinforcing constructs necessary for long term strategic renewal (Dubey et al., 2022; Fayezi et al., 2017).

5.3 Managerial Implications

From a practical perspective, the findings provide actionable guidance for managers seeking to enhance organizational performance in turbulent environments.

1. Prioritize market orientation as a strategic foundation.
   Firms should institutionalize market intelligence systems, customer feedback loops, and competitive analytics to detect emerging shifts early. This market sensing capability enables timely process and technological adaptation.
2. Invest in both process improvement and digital transformation.
   The results confirm that efficiency and innovation are not trade-offs but complementary levels. Managers should integrate lean process redesign with digital tools such as predictive analytics, IoT, and automation to boost responsiveness and cost control simultaneously.
3. Develop resilience as a core organizational capability.
   Resilience must be deliberately built through supplier diversification, risk mapping, redundancy planning, and visibility technologies. The findings suggest that resilience mediates performance, meaning firms without it risk losing efficiency gains during disruptions.
4. Cultivate organizational agility to enhance the resilience and performance link.
   Agility enables firms to transform recovery into renewal. Managers should promote decentralized decision making, cross functional collaboration, and rapid resource reallocation to fully leverage resilience for competitive growth.
5. Adopt a capability orchestration mindset.
   Top management should view MO, efficiency, resilience, and agility as an integrated system of interdependent capabilities rather than isolated functions. This orchestration ensures strategic coherence and enduring competitive advantage.

5.4 Comparative Insights

The findings complement and extend recent empirical work, including Zhao et al. (2023), by showing that digital transformation alone does not produce resilience unless integrated with market orientation and process improvement capabilities. For example, Wamba et al. (2021) highlighted how digital transformation supports resilience in global supply chains, while Sheffi (2021) emphasized the growing importance of resilience as a strategic differentiator. This study empirically integrates those insights within a unified theoretical model, offering a structured view of how firms can convert strategic orientation into measurable outcomes.

Overall, this study advances both theory and practice by showing that market oriented, digitally enabled, and agile organizations are best positioned to achieve sustainable performance in volatile

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environments. It reinforces the notion that resilience is not a static condition but a dynamic capability that evolves through continuous learning and technological integration.
In doing so, the research provides a comprehensive framework for understanding how firms can progress from market sensing to process optimization, digital transformation, resilience building, and ultimately to superior organizational performance.

6. Conclusion and Future Research Directions

6.1 Summary of the Study

This study sets out to examine how market orientation (MO) influences organizational performance (OP) through a series of operational and adaptive capabilities specifically processes improvement (PI), digital transformation (DT), supply chain efficiency (SCE), and supply chain resilience (SCR), while considering the moderating role of organizational agility (OA). Drawing upon the Resource Based View (RBV) and Dynamic Capabilities Theory (DCT), the research proposed and empirically validated a multi-stage capability framework showing how strategic orientation is transformed into superior performance outcomes.
The results confirm that market-oriented firms are more likely to invest in process and digital capabilities, which enhance efficiency and resilience across the supply chain. Resilience, in turn, emerged as the critical mediating mechanism linking efficiency to performance, while agility magnified this relationship by converting stability into proactive growth. Together, these findings emphasize that superior performance arises not from isolated strengths but from the orchestration of interconnected capabilities.

6.2 Theoretical Contributions

This paper makes several important contributions to literature:

1. Integration of strategic and operational capabilities.
   By empirically linking market orientation to both process and digital transformation, the study extends prior models that treated these constructs separately (Kirca et al., 2005; Morgan et al., 2019).
2. Positioning resilience as a dynamic capability.
   The research reconceptualizes supply chain resilience as a higher order dynamic capability that evolves from efficiency and enables recovery, renewal, and long term adaptability (Fayezi et al., 2017).
3. Introducing agility as a capability amplifier.
   The moderating effect of organizational agility demonstrates that agile firms can leverage resilience more effectively, offering a new understanding of how dynamic capabilities interact (Dubey et al., 2022).

Together, these contributions enrich the RBV–DCT dialogue and provide an integrated theoretical perspective on how firms convert market orientation into competitive advantage under volatility.

6.3 Managerial Implications

For practitioners, the findings carry significant implications:

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- Strategic alignment: Firms must ensure that market intelligence systems are directly connected to operational initiatives such as process redesign and digital adoption.
- Capability investment: Resilience should be developed deliberately, not reactively, through redundancy planning, digital visibility, and collaboration across supply chain partners.
- Leadership focus: Executives should foster agility supportive cultures decentralizing decision making, empowering teams, and encouraging rapid experimentation.
- Performance monitoring: Integrating digital dashboards that track resilience metrics (e.g., recovery speed, flexibility, risk exposure) can help managers quantify the impact of capability orchestration.

6.4 Limitations and Future Research

While the study provides valuable insights, several limitations open opportunities for future research.

1. Cross sectional design.
   Because data were collected at a single point in time, causal inferences should be made with caution. Future longitudinal or experimental studies could examine the evolution of capabilities and resilience dynamics over time.
2. Geographic and sectoral scope.
   The sample focused primarily on North American firms. Replication across regions such as Europe, Asia, and the Middle East could enhance generalizability and reveal cultural or institutional moderating factors (Hofstede, 2001).
3. Measurement extensions.
   Future work could incorporate objective performance data (e.g., ROA, ROS, lead time reduction) or multi source responses to mitigate self-report bias.
4. Emerging technologies and sustainability.
   Scholars should explore how technologies like blockchain, AI, and IoT enhance resilience, or how sustainability practices mediate the relationship between digital transformation and performance (Dubey et al., 2020; Wamba et al., 2021).
5. Network level resilience.
   Examining inter organizational collaboration and ecosystem resilience may yield insights into how firms collectively manage disruptions.

6.5 Concluding Remarks

In conclusion, this research demonstrates that the pathway from market orientation to organizational performance is neither direct nor simple it is mediated by a chain of interrelated capabilities that blend efficiency, digitalization, resilience, and agility. Firms that view these elements as a *capability system* rather than as separate initiatives are better equipped to thrive in uncertain, technology driven markets.

Ultimately, this study reinforces the notion that resilient and agile organizations are not merely survivors of disruption but architects of sustained competitive advantage. Future research can build upon this framework to further explore how businesses in the digital era orchestrate strategic, operational, and adaptive competencies to achieve excellence.

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Appendix A. Measurement Items

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Market Orientation (MO)
Source: Narver & Slater (1990); Jaworski & Kohli (1993)
MO1 – Our firm regularly collects information about customers' current and future needs.
MO2 – Our firm frequently monitors competitors' actions and strategies.
MO3 – Market information is shared across departments in our organization.
MO4 – We respond quickly to changes in customer preferences.
MO5 – Our business strategies are driven by customer value creation.

Process Improvement (PI)
Source: Prajogo & Sohal (2006); Flynn et al. (1994)
PI1 – Our organization continuously improves operational processes.
PI2 – Employees regularly seek ways to improve workflow efficiency.
PI3 – Process improvement initiatives are systematically implemented.
PI4 – Operational processes are regularly evaluated and refined.

Digital Transformation (DT)
Source: Bharadwaj et al. (2013); Vial (2019)
DT1 – Our organization actively adopts digital technologies to improve operations.
DT2 – Digital systems are integrated across key organizational functions.
DT3 – Digital technologies enhance data sharing across the supply chain.
DT4 – Digital initiatives support faster and more informed decision making.

Supply Chain Efficiency (SCE)
Source: Li et al. (2006); Wong et al. (2011)
SCE1 – Our supply chain operates with minimal waste and redundancy.
SCE2 – Our organization effectively manages inventory and logistics costs.
SCE3 – Our supply chain processes are highly streamlined.
SCE4 – Our organization efficiently coordinates activities across the supply chain.

Supply Chain Resilience (SCR)
Source: Ambulkar et al. (2015); Brandon-Jones et al. (2014)
SCR1 – Our supply chain can quickly recover from disruptions.
SCR2 – Our organization can adapt rapidly to unexpected supply chain changes.
SCR3 – Our supply chain maintains operational continuity during disruptions.
SCR4 – Our organization can effectively respond to supply chain disturbances.

Organizational Agility (OA)
Source: Overby et al. (2006); Tallon & Pinsonneault (2011)
OA1 – Our organization responds quickly to market changes.
OA2 – Our organization can rapidly adjust operations when conditions change.
OA3 – Our organization is flexible in responding to new opportunities.
OA4 – Our organization can quickly reconfigure resources when necessary.

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Organizational Performance (OP)
Source: Venkatraman & Ramanujam (1986); Li et al. (2006)
OP1 – Our organization has achieved strong sales growth.
OP2 – Our organization has improved market share in recent years.
OP3 – Our organization performs well compared with major competitors.
OP4 – Our organization has achieved strong overall financial performance.