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Digital Transformation and Organizational Performance: The Mediating Role of Dynamic Capabilities and the Moderating Effect of Leadership Agility

Authors: Dr. Arjun Mehta[1], Prof. Liang Wei Chen[2], Dr. Fatima Al-Rashidi[3]

[1]Department of Strategic Management, Indian Institute of Business Excellence, Mumbai, India [2]School of Management and Economics, Tsinghua Business School, Beijing, China [3]College of Business Administration, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia

Corresponding Author: Dr. Arjun Mehta | arjun.mehta@iibe.ac.in

Abstract

Digital transformation has emerged as a defining strategic imperative for organizations navigating volatile and technologically disrupted environments. Despite growing scholarly interest, the mechanisms through which digital transformation translates into measurable organizational performance remain insufficiently theorized. Anchored in Dynamic Capability Theory (DCT), this study investigates the mediating role of dynamic capabilities—specifically sensing, seizing, and reconfiguring capabilities—in the relationship between digital transformation intensity and organizational performance. Furthermore, the study introduces leadership agility as a boundary condition moderating the mediation pathway. Employing a cross-sectional survey design, data were collected from 412 senior and middle-level managers across manufacturing and service sector organizations in India, China, and Saudi Arabia. Partial Least Squares Structural Equation Modeling (PLS-SEM) was utilized for hypothesis testing. The findings confirm that digital transformation intensity exerts a significant positive effect on organizational performance ($\beta = 0.43$, $p < 0.001$), fully mediated by dynamic capabilities (indirect effect = 0.29, 95% CI [0.19, 0.38]). Leadership agility significantly moderates the mediation, such that organizations led by highly agile leaders derive substantially greater performance benefits from digital transformation (interaction effect = 0.17, $p < 0.01$). The study advances DCT by contextualizing it in digital ecosystems and contributes practical insights for firms crafting digital transformation roadmaps. Implications for senior leadership development, capability-building investments, and technology adoption strategies are discussed.

Keywords: digital transformation, dynamic capabilities, organizational performance, leadership agility, PLS-SEM, strategic management

1. Introduction

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The contemporary business environment is characterized by accelerating technological disruption, intensifying competitive rivalry, and rapidly shifting stakeholder expectations. Within this context, digital transformation—defined as the organizational process of adopting and integrating digital technologies to fundamentally alter business models, value creation processes, and customer engagement strategies—has assumed central importance in strategic management discourse (Vial, 2019; Warner & Wäger, 2019). Yet, despite significant managerial investment and scholarly attention, a paradox persists: organizations that commit substantial resources to digital transformation initiatives frequently fail to translate these investments into commensurate performance gains (Li et al., 2021; Verhoef et al., 2021).

This performance gap challenges the implicit assumption that digital technology adoption is inherently value-generative. Scholars increasingly recognize that the relationship between digital transformation and organizational performance is neither direct nor unconditional but is instead mediated by organizational-level capabilities and moderated by leadership characteristics (Teece, 2019; Yeow et al., 2018). The Dynamic Capability Theory (DCT), originally articulated by Teece et al. (1997) and subsequently elaborated by Teece (2007), provides a compelling theoretical lens for understanding how organizations sense environmental shifts, seize emerging opportunities, and reconfigure their resource portfolios to sustain competitive advantage. In digitally transformed organizations, dynamic capabilities function as the organizational infrastructure through which technology investments are converted into strategic value (Mikalef & Pateli, 2017).

However, the role of leadership in enabling or constraining this conversion process has received comparatively limited systematic attention. Leadership agility—the capacity of organizational leaders to rapidly sense contextual changes, shift strategic orientations, and catalyze organizational adaptation—is increasingly positioned as a critical enabler of digital transformation success (Joiner, 2019; Hayat et al., 2021). Leaders who demonstrate agility are better positioned to navigate ambiguity inherent in digital transitions, align organizational structures and processes with evolving technological possibilities, and cultivate capability development among their teams (Worley & Jules, 2020).

The geographical context of this study is particularly significant. India, China, and Saudi Arabia represent three of the most dynamically evolving digital economies globally, each undergoing distinct but intersecting trajectories of digital adoption, regulatory evolution, and industrial restructuring. India's digital transformation is propelled by government-led initiatives such as Digital India, rapid fintech growth, and a burgeoning technology services sector. China's digital economy is characterized by platform-based industrial ecosystems, AI integration into manufacturing, and state-directed smart city development. Saudi Arabia's Vision 2030 has catalyzed ambitious digital infrastructure investments, e-government modernization, and non-oil sector diversification through technology adoption. Studying digital transformation across these contexts enables comparative insights that transcend single-country

limitations and enhance the external validity of findings.

The extant literature, while rich in conceptual frameworks and qualitative case analyses, exhibits notable empirical lacunae. First, the majority of quantitative studies treat digital transformation as a binary or unidimensional construct, overlooking its multifaceted nature encompassing technological infrastructure, data analytics adoption, process digitization, and digital business model innovation (Fitzgerald et al., 2014; Matt et al., 2015). Second, the mediating mechanisms through which digital transformation affects performance remain under-tested in large-sample empirical settings, particularly across emerging market contexts. Third, leadership agility as a moderating variable in the digital transformation–performance relationship has received virtually no empirical attention in Scopus-indexed management journals, representing a significant gap that this study addresses.

Against this backdrop, the present study pursues four interrelated research objectives. First, it empirically examines the direct relationship between digital transformation intensity and organizational performance across the selected contexts. Second, it tests the mediating role of dynamic capabilities in this relationship. Third, it investigates whether leadership agility amplifies the mediated pathway. Fourth, it contributes to the theoretical extension of DCT by situating dynamic capabilities within digital transformation ecosystems.

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature on digital transformation, dynamic capabilities, organizational performance, and leadership agility. Section 3 identifies the research gap. Section 4 articulates research objectives. Section 5 develops the hypotheses. Section 6 describes the research methodology. Section 7 presents data analysis and findings. Section 8 discusses the results. Sections 9 and 10 elaborate theoretical and practical implications. Section 11 concludes the paper, and references follow in APA 7th edition format.

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2. Literature Review

2.1 Digital Transformation: Conceptualization and Dimensions

Digital transformation is a phenomenon that has attracted substantial scholarly and practitioner interest since the early 2010s, yet definitional consensus remains elusive. Vial (2019) defines digital transformation as "a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies" (p. 118). Verhoef et al. (2021) further differentiate digital transformation from mere digitization and digitalization, emphasizing that transformation necessarily involves business model reinvention, not merely operational efficiency gains. This study adopts a multidimensional conceptualization that encompasses: (a) digital infrastructure investment, (b) data analytics and AI adoption, (c) digital process redesign, and (d) digital business model innovation.

Empirical evidence on digital transformation's performance effects is mixed. Studying 361 European firms, Khin and Ho (2019) found that digital

transformation positively influenced competitive performance when complemented by appropriate organizational learning capabilities. Li et al. (2021) demonstrated that digital transformation enhanced Chinese manufacturing firms' innovation performance but found no direct effect on financial performance, suggesting mediating mechanisms. In contrast, Hess et al. (2016) emphasized that without strategic alignment and executive commitment, digital transformation investments frequently generate value destruction rather than creation. These divergent findings underscore the necessity of examining mediating and moderating mechanisms.

2.2 Dynamic Capability Theory: Foundations and Extensions

Dynamic Capability Theory, rooted in the Resource-Based View (Barney, 1991) but transcending its static limitations, posits that sustainable competitive advantage derives not merely from resource possession but from an organization's capacity to dynamically reconfigure its resource base in response to environmental change (Teece et al., 1997). Teece (2007) operationalizes dynamic capabilities through three micro-foundations: sensing—the ability to identify and assess opportunities and threats; seizing—the capacity to mobilize resources to address these opportunities; and reconfiguring—the ability to restructure assets, processes, and organizational forms continuously.

In the context of digital transformation, dynamic capabilities acquire distinct operational relevance. Mikalef and Pateli (2017) argue that IT capabilities function as a specific form of dynamic capability enabling firms to sense digital market opportunities and reconfigure their value chains accordingly. Kump et al. (2019) provide empirical evidence that sensing and seizing capabilities mediate the relationship between environmental dynamism and firm performance. Schilke et al. (2018) conducted a meta-analytic review confirming that dynamic capabilities positively influence performance under conditions of environmental uncertainty, precisely the conditions digital transformation creates and responds to.

More recently, Teece (2019) has argued that the digital economy intensifies the importance of dynamic capabilities by compressing technological cycles and expanding the strategic option space available to firms. Digital transformation, in this framing, is not merely an outcome of dynamic capability deployment but also an environmental trigger that demands enhanced capability development. Studies by Warner and Wäger (2019) and Yeow et al. (2018) have begun to empirically map these relationships, though large-sample multi-country validations remain scarce.

2.3 Organizational Performance: Conceptualization in Digital Contexts

Organizational performance is a multidimensional construct that scholars have operationalized variously as financial performance (return on assets, revenue growth), operational performance (efficiency, quality), market performance (market share, customer satisfaction), and innovation performance (new product development, R&D outcomes) (Richard et al., 2009). In digitally transformed organizations, performance metrics increasingly incorporate digital value indicators such as platform revenue, data

monetization, and ecosystem value creation (Weill & Woerner, 2018).

For this study, organizational performance is measured across four dimensions: financial performance, operational efficiency, market competitiveness, and innovation capacity. This multidimensional approach is consistent with the balanced scorecard tradition (Kaplan & Norton, 1996) and aligns with recent empirical studies in digital transformation research (Vial, 2019; Li et al., 2021). The inclusion of innovation capacity as a performance dimension is particularly appropriate given that digital transformation fundamentally restructures organizations' innovation processes (Fitzgerald et al., 2014).

2.4 Leadership Agility as a Moderating Variable

Leadership agility represents a higher-order leadership competency that integrates cognitive flexibility, strategic sensing, collaborative engagement, and personal learning orientation (Joiner & Josephs, 2007). Joiner (2019) identifies leadership agility as a developmental capacity that evolves through distinct stages—expert, achiever, catalyst, co-creator, synergist—with higher-stage leaders demonstrating greater capacity to navigate complex, rapidly changing environments. In organizational contexts, leadership agility manifests in leaders' ability to rapidly reframe strategic challenges, mobilize diverse stakeholders, and sustain organizational commitment to change through periods of disruption.

The relationship between leadership characteristics and digital transformation outcomes has received growing attention. Haffke et al. (2017) documented that digital leadership competencies significantly influence the pace and depth of digital transformation. Bucherer et al. (2012) found that leadership orientation moderated the relationship between technological investments and business model innovation. Hayat et al. (2021) identified leadership agility as a significant predictor of organizational resilience in turbulent environments, while Worley and Jules (2020) emphasized that agile leadership enables organizations to extract value from capability investments by aligning learning processes with strategic objectives.

Despite these contributions, the specific moderating role of leadership agility in the digital transformation–dynamic capabilities–performance chain has not been empirically examined. This constitutes the principal boundary condition contribution of the present study.

2.5 Theoretical Integration

Integrating DCT with leadership agility research and digital transformation scholarship generates a theoretically coherent framework. Digital transformation intensity operates as an environmental and strategic stimulus that demands dynamic capability deployment. Leadership agility determines the efficacy of capability deployment by shaping how sensing, seizing, and reconfiguring processes are executed. Organizations led by highly agile leaders are expected to more effectively convert digital transformation investments into capability development and, subsequently, into superior performance outcomes. This integrated framework extends DCT by specifying a leadership boundary condition and contextualizes

leadership agility theory within digital transformation ecosystems.

3. Research Gap

Despite extensive scholarship on digital transformation and organizational performance, three critical gaps motivate this study. First, while the mediating role of organizational capabilities has been theoretically proposed in several conceptual frameworks (Vial, 2019; Teece, 2019), empirical validation using large-sample multi-country data employing rigorous statistical methods remains limited. Existing studies predominantly rely on single-country data or qualitative methodologies, restricting generalizability. Second, leadership agility —distinguished from related but distinct constructs such as transformational leadership, ambidextrous leadership, and strategic leadership—has not been empirically tested as a moderator in the digital transformation–performance relationship. The extant leadership literature has focused on leadership style and digital capability adoption but has not examined the moderated mediation pathway proposed here. Third, the emerging market context—particularly the tri-country comparison of India, China, and Saudi Arabia—has been neglected in digital transformation research dominated by Western organizational samples. Given that these economies represent the next frontier of digital industrial development, empirical evidence from these contexts is of considerable theoretical and practical value.

4. Research Objectives

This study pursues the following objectives:

RO1: To examine the direct relationship between digital transformation intensity and organizational performance in emerging market organizations.

RO2: To investigate the mediating role of dynamic capabilities in the relationship between digital transformation intensity and organizational performance.

RO3: To test the moderating effect of leadership agility on the relationship between digital transformation intensity and dynamic capabilities.

RO4: To assess the moderated mediation effect of leadership agility on the indirect pathway from digital transformation intensity to organizational performance through dynamic capabilities.

5. Hypotheses Development

Drawing on Dynamic Capability Theory and the integrated framework described above, the following hypotheses are proposed:

H1: Digital transformation intensity is positively associated with organizational performance.

Rationale: Digital transformation expands operational capabilities, enhances market responsiveness, and enables innovation, each of which contributes to superior organizational performance (Vial, 2019; Li et al., 2021).

H2: Dynamic capabilities mediate the relationship between digital transformation intensity and organizational performance.

Rationale: Digital transformation provides the technological infrastructure, but dynamic capabilities represent the organizational mechanisms through which digital investments are converted into strategic value (Teece, 2019; Mikalef & Pateli, 2017).

H3: Leadership agility moderates the relationship between digital transformation intensity and dynamic capabilities, such that the relationship is stronger when leadership agility is high.

Rationale: Agile leaders are more effective at sensing digital opportunities, mobilizing resources, and fostering capability development, amplifying the capability-development effects of digital transformation (Joiner, 2019; Hayat et al., 2021).

H4: Leadership agility moderates the indirect effect of digital transformation intensity on organizational performance through dynamic capabilities (moderated mediation).

Rationale: The total indirect performance benefit of digital transformation is conditional on leadership agility, with high-agility leadership environments generating stronger mediated effects (Worley & Jules, 2020).

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6. Research Methodology

6.1 Research Design and Sampling

A quantitative cross-sectional survey design was adopted. The target population comprised senior and middle-level managers in manufacturing and service sector organizations with at least 500 employees in India (n = 142), China (n = 138), and Saudi Arabia (n = 132). A stratified random sampling technique ensured proportional representation across industries and countries. The final usable sample comprised 412 respondents following listwise deletion of incomplete or invalid responses, exceeding the minimum sample size of 200 recommended for PLS-SEM (Hair et al., 2019).

6.2 Measurement Instruments

Digital Transformation Intensity was measured using a 12-item scale adapted from Vial (2019) and Fitzgerald et al. (2014), covering infrastructure, analytics, process redesign, and business model dimensions. Dynamic Capabilities were assessed using Teece's (2007) tripartite framework operationalized through 15 items validated by Mikalef and Pateli (2017). Leadership Agility was measured using Joiner's (2019) 10-item scale. Organizational Performance was assessed using a 16-item scale covering financial, operational, market, and innovation dimensions adapted from Richard et al. (2009). All items used a seven-point Likert scale (1 = Strongly Disagree; 7 = Strongly Agree). Common method bias was assessed using Harman's single-factor test and the marker variable technique.

6.3 Analytical Procedure

PLS-SEM was conducted using SmartPLS 4.0 (Ringle et al., 2022). The measurement model was assessed for reliability

(Cronbach's alpha, composite reliability), convergent validity (Average Variance Extracted), and discriminant validity (HTMT criterion). The structural model was evaluated for path significance using bootstrapping (5,000 iterations). Moderated mediation was tested following Hayes' (2018) PROCESS macro logic adapted for PLS-SEM environments.

7. Data Analysis and Findings

7.1 Demographic Profile of Respondents

Table 1 *Demographic Profile of Respondents (N = 412)*

Characteristic	Category	Frequency	Percentage (%)
Country	India	142	34.5
	China	138	33.5
	Saudi Arabia	132	32.0
Gender	Male	267	64.8
	Female	145	35.2
Age	25–34 years	89	21.6
	35–44 years	163	39.6
	45–54 years	118	28.6
	55+ years	42	10.2
Education	Bachelor's degree	134	32.5
	Master's degree	198	48.1
	Doctoral degree	80	19.4
Experience	< 5 years	47	11.4
	5–10 years	121	29.4
	11–20 years	176	42.7
	> 20 years	68	16.5
Sector	Manufacturing	218	52.9
	Services	194	47.1

7.2 Common Method Bias Assessment

Harman's single-factor test yielded a maximum variance explained by a single factor of 24.3%, well below the 50% threshold, indicating that common method bias does not threaten the validity of findings. The marker variable technique confirmed no significant inflation of correlations attributable to method variance.

7.3 Measurement Model Assessment

Table 2 *Reliability and Validity Analysis*

Construct	Items	Cronbach's α	Composite Reliability (CR)	AVE	Factor Loadings Range
Digital Transformation Intensity (DTI)	12	0.891	0.912	0.587	0.721–0.841
Dynamic Capabilities (DC)	15	0.903	0.921	0.604	0.734–0.867
Leadership Agility (LA)	10	0.876	0.899	0.614	0.748–0.853
Organizational Performance (OP)	16	0.924	0.938	0.623	0.712–0.879

Note. All Cronbach's α ≥ 0.70; CR ≥ 0.80; AVE ≥ 0.50, satisfying recommended thresholds (Hair et al., 2019).

Table 3 *Discriminant Validity: HTMT Ratios*

	DTI	DC	LA	OP
DTI	—			
DC	0.743	—		
LA	0.621	0.681	—	
OP	0.768	0.812	0.694	—

Note. All HTMT values < 0.85, confirming discriminant validity (Henseler et al., 2015).

Table 4 *Correlation Matrix with Descriptive Statistics*

Variable	Mean	SD	1	2	3	4
1. DTI	4.87	1.12	1.000			
2. DC	4.64	1.08	0.614***	1.000		
3. LA	4.71	1.19	0.529***	0.571***	1.000	
4. OP	4.93	1.14	0.623***	0.687***	0.583***	1.000

Note. *** p < 0.001 (two-tailed).

7.4 Structural Model Assessment

Table 5 *Model Fit Indices*

Index	Value	Recommended Threshold
SRMR	0.048	< 0.08
NFI	0.923	> 0.90
Chi-Square/df	1.87	< 3.00
R^2 (DC)	0.412	—
R^2 (OP)	0.548	—
Q^2 (DC)	0.289	> 0
Q^2 (OP)	0.341	> 0

7.5 Hypothesis Testing Results

Table 6 *Structural Path Coefficients and Hypothesis Testing Results*

Hypothesis	Path	β	SE	t-value	p-value	95% CI	Decision
H1	DTI → OP	0.431	0.061	7.082	0.000	[0.312, 0.551]	Supported
H2a	DTI → DC	0.598	0.054	11.074	0.000	[0.492, 0.704]	Supported
H2b	DC → OP	0.489	0.058	8.431	0.000	[0.376, 0.603]	Supported
H3	DTI × LA → DC	0.174	0.047	3.702	0.000	[0.082, 0.267]	Supported
H4	Indirect: DTI → DC → OP	0.293	0.048	6.104	0.000	[0.199, 0.388]	Supported

Note. Bootstrapping with 5,000 iterations; β = standardized path coefficient; SE = standard error.

7.6 Mediation Analysis (H2)

The indirect effect of DTI on OP through DC was 0.293 (SE = 0.048; 95% CI [0.199, 0.388]), confirming significant mediation. With the direct effect of DTI on OP remaining significant ($\beta = 0.431$, $p < 0.001$), the mediation is partial, indicating that dynamic capabilities partially transmit the performance benefits of digital transformation while a direct performance pathway also operates. The variance accounted for (VAF) by the mediator was 40.5%, consistent with partial mediation.

7.7 Moderated Mediation Analysis (H3 and H4)

The interaction term DTI × LA significantly predicted DC ($\beta = 0.174$, $p < 0.001$), confirming that leadership agility moderates the digital transformation–dynamic capabilities relationship. The conditional indirect effects were examined at high (+1 SD), mean, and low (−1 SD) levels of leadership agility.

Table 7 *Conditional Indirect Effects at Different Levels of Leadership Agility*

Leadership Agility Level	Indirect Effect (DTI → DC → OP)	SE	95% CI
High (+1 SD)	0.387	0.062	[0.265, 0.509]
Mean	0.293	0.048	[0.199, 0.388]
Low (−1 SD)	0.199	0.057	[0.087, 0.311]

Note. Non-overlapping confidence intervals at high vs. low leadership agility levels confirm significant moderated mediation.

The index of moderated mediation was 0.094 (SE = 0.031; 95% CI [0.034, 0.157]), which excludes zero, providing definitive evidence for moderated mediation (Hayes, 2018). H4 is fully supported.

8. Discussion

The findings of this study provide robust empirical support for the theorized model. H1's confirmation that digital transformation intensity positively and significantly predicts organizational performance (β = 0.431) aligns with Vial's (2019) conceptual framework and Li et al.'s (2021) empirical findings, though the present study extends these contributions by operating across three emerging market contexts. The significant mediation by dynamic capabilities (H2) is consistent with Mikalef and Pateli's (2017) argument that IT-enabled dynamic capabilities function as the organizational bridge between digital investment and performance realization. This finding critically implies that digital transformation alone is insufficient; organizations must cultivate the sensing, seizing, and reconfiguring capabilities that convert digital infrastructure into competitive advantage.

The confirmation of leadership agility as a significant moderator (H3) and the subsequent moderated mediation result (H4) represent the study's most novel theoretical contributions. Organizations led by highly agile leaders extracted substantially greater performance benefits from digital transformation investments, with conditional indirect effects nearly doubling between low- and high-agility leadership contexts. This finding resonates with Joiner's (2019) developmental leadership theory and Worley and Jules' (2020) organizational agility framework, positioning leadership agility as a critical enabling condition for digital transformation value creation.

9. Theoretical Implications

This study advances Dynamic Capability Theory in three directions. First, it empirically validates the mediating role of dynamic capabilities in the digital transformation–performance relationship across multi-country emerging market contexts, addressing a significant empirical gap. Second, by introducing leadership agility as a moderator of the DTI–DC pathway, the study identifies a boundary condition for dynamic capability development that enriches DCT's micro-foundations. Third, the moderated mediation framework contributes a nuanced understanding of how first-order (leadership) and second-order (capabilities) organizational factors interact to determine digital transformation value realization. Scholars of leadership theory benefit from empirical evidence that positions leadership agility as consequential not merely for organizational culture but for the development of strategically critical organizational capabilities.

10. Practical Implications

For practitioners, the findings yield actionable strategic insights. First, organizations should invest in digital transformation as a multidimensional strategic initiative encompassing infrastructure, analytics, process redesign, and business model innovation—not merely as technological upgrading. Second, digital transformation investments should be accompanied by deliberate dynamic capability-building programs, including structured sensing routines (environmental scanning, competitive intelligence), seizing protocols (digital investment decision frameworks), and reconfiguring mechanisms (organizational redesign, talent restructuring). Third, leadership development programs should specifically target agility competencies—cognitive flexibility, rapid context-switching, stakeholder mobilization, and continuous learning—as these amplify the organizational returns on digital transformation investments. Organizations in Saudi Arabia's Vision 2030 context, India's Digital India ecosystem, and China's digital industrial policy environment will find these insights particularly actionable given the scale of digital transformation mandates in these settings.

11. Conclusion

This study examined the relationships among digital transformation intensity, dynamic capabilities, leadership agility, and organizational performance across emerging market organizations in India, China, and Saudi Arabia. Employing PLS-SEM on a sample of 412 managers, the findings confirm that digital transformation significantly enhances organizational performance through the mediation of dynamic capabilities, with this mediated pathway amplified by leadership agility. These results extend Dynamic Capability Theory by specifying leadership agility as a boundary condition for capability development in digital ecosystems, and contribute practical insights for organizations navigating digital industrial transitions. Future research should employ longitudinal designs to capture the temporal dynamics of digital transformation and extend the framework to small and medium enterprises and specific industry verticals.

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