

From Digital Readiness to Enterprise Competitiveness: A Moderated-Mediation Framework Integrating Resource-Based View, Dynamic Capabilities, and Strategic Cognition for Service SMEs

Yin Haijian¹, Devika Nadarajah², Huam Hon Tat³

¹ Putra Business School (PBS), Malaysia.

Email: pbs23104066@grad.putrabs.edu.my

² Putra Business School (PBS), Malaysia.

Email: devika@putrabs.edu.my

³ Kuala Lumpur University of Science and Technology (KLUST), Malaysia.

Email: huam@klust.edu.my

Abstract: The digital transformation of small and medium-sized enterprises (SMEs) has emerged as a central concern in strategic management scholarship, yet a persistent “digitalization paradox”—wherein substantial technology investments fail to yield commensurate competitive returns—continues to plague resource-constrained service firms, particularly in hyper-competitive emerging market contexts. Drawing upon the theoretical integration of the Resource-Based View, Dynamic Capabilities Theory, and Strategic Cognition Theory, this paper proposes a comprehensive moderated-mediation conceptual framework explaining how digital readiness translates into enterprise competitiveness among service SMEs. The framework identifies five interdependent digital resource antecedents—IT capability, digital transformation strategy, technology investment, leadership quality, and employee digital skills—that collectively constitute a theoretically-derived resource bundle. Enterprise innovation is positioned as the pivotal mediating mechanism converting these static digital inputs into dynamic competitive outputs, while organizational cognition operates as a critical boundary condition moderating the innovation-to-competitiveness pathway. Twelve theoretically-grounded propositions are developed: five direct effect propositions linking each digital resource to competitiveness, one direct effect proposition for innovation, five mediation propositions for the innovation-mediated pathways, and one moderation proposition for the cognitive boundary condition. By systematically decomposing the “black box” of value creation and specifying the cognitive boundary conditions under which digital transformation succeeds or fails, this paper makes three specific contributions to the literature: (1) a unified, theoretically-derived resource bundle for SME digital transformation that moves beyond single-factor analyses; (2) a process-oriented explanation of how digital inputs become competitive outputs through the mediating engine of enterprise innovation; and (3) the integration of strategic cognition as a moderating boundary condition that determines whether innovative efforts translate into sustainable competitive advantage. The framework is particularly relevant to growth-oriented service SMEs operating in high-pressure, resource-constrained environments such as Beijing, China, where the digitalization paradox is most acutely manifest.

Keywords: digital transformation, enterprise competitiveness, enterprise innovation, organizational cognition, Resource-Based View, Dynamic Capabilities Theory, Strategic Cognition Theory, service SMEs



1. Introduction

1.1 *The Digitalization Paradox in Service SMEs*

The rapid proliferation of digital technologies—encompassing artificial intelligence, big data analytics, cloud computing, and the Internet of Things—has fundamentally altered the competitive landscape for enterprises worldwide (Verhoef et al., 2021; Vial, 2019). No longer merely an operational enhancement, digital transformation has become an existential strategic imperative for firms seeking to sustain competitiveness in increasingly volatile markets (Hanelt et al., 2021; Kraus et al., 2022). The service sector, in particular, has emerged as the primary arena wherein digital transformation exerts its most transformative effects, constituting the majority of global economic output and serving as a predominant economic engine for both developed and developing economies. Within this broad macroeconomic context, small and medium-sized enterprises (SMEs) occupy a paradoxical position: they constitute the overwhelming majority of market participants and employment providers, yet they remain structurally ill-equipped to absorb the demands of comprehensive digital transformation (Clemente-Almendros et al., 2024; Hendrawan et al., 2024).

The central paradox confronting service SMEs in the digital era may be characterized as follows. On one hand, these firms face relentless competitive pressure to invest in digital technologies as a prerequisite for survival. On the other hand, the very investments they are compelled to make often fail to generate the anticipated competitive returns, and may in fact erode their already precarious financial positions (Chen et al., 2024; Singh et al., 2024). This “digitalization paradox”—the disjuncture between substantial technology investments and disappointing competitive outcomes—has been documented across multiple national contexts but is particularly acute in hyper-competitive, high-cost emerging market environments where SMEs operate with razor-thin margins and severely constrained resource endowments (Dąbrowska et al., 2022; Saeedikiya et al., 2024).

The municipality of Beijing, China, represents an especially instructive context for examining this paradox. As China’s capital and paramount technological innovation center, Beijing’s service sector contributes over 80% of municipal GDP—substantially exceeding the national average and reflecting the economic structure of the world’s most developed cities (He, 2023). The city hosts more than 2.13 million active SMEs, with 720 new market entities registered daily, creating an extraordinarily competitive operating environment (Beijing Municipal Bureau of Economy and Information Technology, 2025). Yet beneath this veneer of economic dynamism lies a harsh competitive reality: in the first quarter of 2024, medium-sized enterprises experienced a 6.8% decline in operating revenue, while micro-enterprises suffered a devastating 10.6% contraction (Beijing Municipal Bureau of Statistics, 2024). The accommodation and catering industry saw aggregate profits plummet by 46.9%, illustrating the extreme vulnerability of traditional service providers in this hyper-competitive digitalized marketplace (Beijing Municipal Bureau of Statistics, 2024). Despite aggressive government intervention through programs such as the “Specialized, Refined, Differential, and Innovative” (SRDI) initiative—subsidizing 620 SMEs for digitalization and facilitating the clearance of 1.29 billion RMB in corporate arrears—the structural gap between digital investment and competitive returns remains unaddressed (Beijing Municipal Bureau of Economy and Information Technology, 2025).

The theoretical significance of this paradox extends beyond the immediate policy concerns of Beijing’s SME sector. The digitalization paradox challenges foundational assumptions in the strategic management literature regarding the relationship between technology adoption and competitive advantage (Chen et al., 2024; Singh et al., 2024). If digital transformation is indeed a strategic necessity, why do so many resource-constrained SMEs find that their technology investments produce disappointing—or even negative—competitive outcomes? Answering this question requires a fundamental re-examination of how digital readiness is conceptualized, how value is created from digital inputs, and what boundary conditions determine whether digital transformation succeeds or fails.

1.2 *Research Gaps*

A review of the extant literature reveals three interrelated theoretical gaps that collectively limit scholarly understanding of the digitalization-competitiveness relationship in service SMEs.

Gap 1: Lack of Theoretically-Derived Resource Bundles. The first and most fundamental gap concerns the absence of a unified, theoretically-derived resource bundle for conceptualizing digital readiness in SMEs. Existing empirical studies have typically examined individual technological determinants—such as IT infrastructure adoption, software implementation rates, or discrete IT expenditures—without embedding these variables within a comprehensive theoretical framework that explains why these particular resources should be considered together (Rizana et al., 2025; Sagala & Ori, 2024). While the Resource-Based View (RBV) provides the theoretical justification

for examining bundles of valuable, rare, inimitable, and non-substitutable resources (Barney, 1991; Grant, 1996), the digital transformation literature has been slow to operationalize this theoretical logic in the SME context. The result is a fragmented research landscape in which scholars examine IT capabilities, digital strategies, technology investments, leadership qualities, and employee skills as isolated variables, without recognizing their theoretically-mandated interdependence as complementary components of a unified digital resource bundle (Shao et al., 2025; Teng et al., 2022).

Gap 2: The Black Box of Value Creation. The second gap pertains to the pervasive “black box” surrounding the mechanism through which digital inputs are converted into competitive outputs. Theoretical models such as the Technology-Organization-Environment (TOE) framework have proven effective in explaining the preconditions for technology adoption, but they offer limited explanatory insight into how adoption generates subsequent competitive advantage (Pham et al., 2022). Much of the existing literature makes a conceptual leap from technology adoption to financial performance, implicitly assuming that value transfer is automatic, frictionless, and guaranteed (Chen & Kim, 2023; Merín-Rodríguez et al., 2024). This technologically-deterministic assumption has been decisively refuted by the digitalization paradox itself, in which sufficient levels of IT investment and capability development frequently coexist with rapid declines in market competitiveness. What is missing from the literature is a theoretically-grounded mediating mechanism that explains the process through which static digital resources are actively transformed into dynamic competitive benefits (Khin & Ho, 2019).

Gap 3: Missing Cognitive Boundary Conditions. The third gap concerns the absence of cognitive boundary conditions in existing digital transformation frameworks. The empirical literature on SME digitalization is characterized by striking inconsistency and contradiction: some severely resource-constrained enterprises successfully innovate and thrive, while others with ostensibly superior digital resources stagnate, resist change, and ultimately fail (Marzi et al., 2023). Such contradictory outcomes indicate that digital resources and innovative activity alone are insufficient to ensure competitive success. Recent scholarly work has increasingly called for greater engagement with cognitive, psychological, and knowledge-management perspectives to explain these inconsistent results (Hafeez et al., 2025; Kaplan & Tripsas, 2008). Organizational cognition—the shared mental models, interpretive schemes, and strategic sensemaking capacities of organizational leadership—represents a critically understudied determinant of transformation success, particularly in the SME context where the cognitive orientations of a single founder or CEO often determine the strategic trajectory of the entire enterprise (Chen et al., 2025; Kaplan, 2008).

1.3 Contribution Statement

This paper addresses these three research gaps by proposing a comprehensive moderated-mediation conceptual framework that integrates the Resource-Based View, Dynamic Capabilities Theory, and Strategic Cognition Theory. The paper makes three specific contributions to the strategic management and digital transformation literature.

First, this paper advances a unified, theoretically-derived resource bundle for SME digital transformation. Drawing upon the RBV, the framework identifies five interdependent digital resource antecedents—IT capability, digital transformation strategy, technology investment, leadership quality, and employee digital skills—that collectively constitute the minimum resource configuration necessary for meaningful digital transformation in resource-constrained service SMEs. This approach moves beyond single-factor analyses to embrace the theoretically-mandated complementarity among technological, strategic, financial, human, and leadership resources (Barney, 1991; Grant, 1996).

Second, this paper illuminates the “black box” of value creation by positioning enterprise innovation as the pivotal mediating mechanism through which digital resources are converted into competitive outcomes. Drawing upon Dynamic Capabilities Theory, the framework argues that the five digital resources do not directly produce competitiveness; rather, they must be dynamically reconfigured through innovation processes—encompassing product innovation, process innovation, market innovation, and behavioral innovation—to generate tangible competitive benefits (Teece, 2018; Teece et al., 1997). This mediating specification provides a process-oriented explanation that accounts for the digitalization paradox: enterprises that possess digital resources but fail to activate the innovation conversion engine remain burdened by sunk costs without competitive returns.

Third, this paper integrates organizational cognition as a critical boundary condition that moderates the innovation-to-competitiveness pathway. Drawing upon Strategic Cognition Theory, the framework argues that the ultimate effectiveness of innovation in generating competitive advantage is contingent upon the cognitive agility of the enterprise—its capacity for environmental sensing, information processing, strategic response, and digital acuity (Gavetti, 2005; Kaplan & Tripsas, 2008). This integration addresses the inconsistent empirical findings in the SME

digitalization literature by specifying the cognitive conditions under which innovative efforts succeed or fail, providing a theoretically-grounded explanation for why similarly-resourced SMEs achieve divergent competitive outcomes.

1.4 Paper Organization

The remainder of this paper is organized as follows. Section 2 presents the theoretical background, introducing and integrating the Resource-Based View, Dynamic Capabilities Theory, and Strategic Cognition Theory. Section 3 provides a comprehensive literature review of the framework's constituent constructs, organized thematically around the dependent variable (enterprise competitiveness), the five independent variables (digital resource antecedents), the mediating variable (enterprise innovation), and the moderating variable (organizational cognition). Section 4 develops the conceptual framework and presents twelve theoretically-grounded propositions. Section 5 discusses the theoretical, practical, and policy implications of the framework. Section 6 concludes with a summary of contributions, acknowledges limitations of the conceptual approach, and suggests directions for future empirical validation.

2. Theoretical Background

The conceptual framework proposed in this paper rests upon the systematic integration of three complementary theoretical perspectives: the Resource-Based View (RBV), Dynamic Capabilities Theory (DCT), and Strategic Cognition Theory. Each theory addresses a distinct element of the digital transformation-competitiveness relationship, and their integration provides a comprehensive theoretical architecture for understanding why certain resource configurations matter, how they generate value, and under what conditions value creation succeeds or fails.

2.1 Resource-Based View (RBV)

The Resource-Based View, originating in the seminal contributions of Barney (1991) and Grant (1996), provides the foundational theoretical logic for understanding why firms differ in their competitive performance and how internal resource endowments drive sustainable competitive advantage. The core proposition of RBV holds that firms achieve competitive advantage by acquiring, developing, and deploying strategic resources that are simultaneously valuable, rare, inimitable, and non-substitutable—the so-called VRIN criteria (Barney, 1991). Valuable resources enable firms to exploit opportunities or neutralize threats in their competitive environment; rare resources are possessed by few competitors; inimitable resources cannot be readily duplicated; and non-substitutable resources lack strategic equivalents (Grant, 1996).

The RBV provides the essential theoretical justification for the selection and bundling of the five independent variables in the proposed framework. In the context of digital transformation, the VRIN criteria manifest in specific ways. IT capability represents a complex integration of infrastructure, human technical expertise, and systems integration that is difficult for competitors to replicate because its value depends on firm-specific configurations and organizational learning processes (Bharadwaj, 2000; Wade & Hulland, 2004). Digital transformation strategy provides the rare and inimitable organizational asset of strategic alignment, ensuring that technological investments are coordinated with long-term business objectives and market demands in ways that reflect the unique competitive positioning of each firm (Bharadwaj et al., 2013; Matt et al., 2015). Technology investment constitutes the formative financial resource that enables the acquisition of foundational digital assets, but its competitive value is contingent upon how it is deployed within the broader resource bundle (Aboelmaged, 2018; Chakravarty et al., 2013). Leadership quality serves as the orchestrating resource that coordinates the entire digital transformation effort, providing vision, motivation, and change management capacity that is inherently firm-specific and path-dependent (Avolio & Bass, 2004; Bass & Riggio, 2006). Employee digital skills represent the human capital resource that converts technological potential into operational reality, a resource that is rare and difficult to imitate because it reflects cumulative investments in training, organizational culture, and experiential learning (Falloon, 2020; Vuorikari et al., 2016).

Critically, the RBV emphasizes that competitive advantage emerges not from the possession of any single resource but from the synergistic combination of complementary resources that jointly create causally ambiguous performance advantages (Barney, 1991). This complementarity principle is particularly relevant to SME digital transformation, where research has demonstrated that the absence of any one critical resource—such as having IT investment without employee digital skills, or visionary leadership without a clear strategic roadmap—results in the collapse of the entire digital configuration, producing wasted capital and organizational cynicism (Shao et al., 2025; Teng et al., 2022). Thus, the RBV mandates that digital readiness be conceptualized as a resource bundle rather than a collection of independent variables.

2.2 Dynamic Capabilities Theory (DCT)

While the RBV effectively explains how firms accumulate strategic resources, it offers limited guidance on how firms adapt and reconfigure these resources in rapidly changing environments. Dynamic Capabilities Theory, originally formulated by Teece, Pisano, and Shuen (1997) and subsequently refined by Teece (2014, 2018), addresses this limitation by focusing on the firm's ability to integrate, build, and reconfigure internal and external competencies in response to rapidly changing market conditions. Dynamic capabilities are defined as the firm's capacity to sense opportunities and threats, seize opportunities while mitigating risks, and transform business models to maintain competitive alignment (Teece, 2018). These capabilities are deeply embedded within the enterprise's social, structural, and cultural context, making them scarce, valuable, and difficult to imitate (Helfat & Peteraf, 2015).

The DCT provides the theoretical logic for positioning enterprise innovation as the mediating mechanism in the proposed framework. According to this perspective, the mere possession of digital resources—no matter how VRIN-compliant—does not automatically generate competitive advantage. Static resources must be dynamically reconfigured and redeployed through innovation processes that create new products, services, processes, and business models (Helfat & Martin, 2015; Teece, 2014). Wang, Senaratne, and Rafiq (2015) argue that firms with strong dynamic capabilities are more likely to innovate continuously, especially in turbulent markets, fostering both technological and non-technological innovation as an indirect pathway to competitive advantage. Schilke (2014) further demonstrates that dynamic capabilities affect enterprise performance through intermediate outcomes such as innovation, adaptability, and strategic flexibility.

The DCT thus explains why the digitalization paradox occurs: firms that possess digital resources but lack the dynamic capability to reconfigure them through innovation processes find their investments converted into sunk costs rather than competitive advantages. This is particularly acute in the SME context, where Saeedikiya et al. (2024) argue that digital transformation success depends critically on the presence of dynamic capabilities that enable firms to sense, seize, and transform digital inputs. Without these dynamic reconfiguration mechanisms, SMEs experience organizational paralysis rather than agility, even as they accumulate substantial digital resource stocks (Singh et al., 2024).

2.3 Strategic Cognition Theory

Strategic Cognition Theory addresses a different question: why do similarly-resourced firms, facing similar competitive conditions, achieve divergent outcomes? Originating in the work of Gavetti and Levinthal (2000) and further developed by Gavetti (2005) and Kaplan and Tripsas (2008), this theoretical perspective emphasizes the role of cognitive structures—shared mental models, interpretive schemes, attention patterns, and sensemaking processes—in shaping how organizations perceive, interpret, and respond to their strategic environments. Organizational cognition encompasses both cognitive structures (the shared assumptions and mental maps created through historical experience) and shared cognition (the knowledge and beliefs that reduce information asymmetry and create team consensus) (Helfat & Peteraf, 2015; Hodgkinson & Healey, 2011).

The Strategic Cognition Theory provides the theoretical foundation for positioning organizational cognition as a moderating boundary condition in the proposed framework. This theory posits that the conversion of innovative activity into competitive advantage is not automatic but is fundamentally shaped by the cognitive orientation of the organization (Kaplan & Tripsas, 2008). Firms with rigid, path-dependent, or cognitively biased leadership may systematically misinterpret market signals, misallocate resources, and undermine their own innovative efforts (Tripsas & Gavetti, 2000). Conversely, firms with cognitively agile leadership—characterized by environmental sensing acuity, rapid information processing, adaptive strategic response, and digital acuity—are able to amplify the competitive returns from their innovation investments by ensuring timely market alignment and rapid strategic adaptation (Helfat & Peteraf, 2015; Teece, 2018).

The cognitive dimension is particularly critical in the SME context because cognitive configurations in smaller firms are often dominated by the mental models of a single founder or CEO, making the enterprise especially vulnerable to cognitive biases, overconfidence, and strategic myopia (Chen et al., 2025; Marzi et al., 2023). Helfat and Peteraf (2015) argue that managerial cognitive capabilities underpin the sensing, seizing, and reconfiguring on which successful transformation depends, while Kaplan (2008) shows that strategy making under uncertainty unfolds as “framing contests” in which prevailing cognitive frames determine whether innovative initiatives are pursued or abandoned.

2.4 Theoretical Integration

The integration of RBV, DCT, and Strategic Cognition Theory creates a theoretically-coherent architecture that addresses distinct but complementary questions in the digital transformation-competitiveness relationship. Table 1 summarizes this theoretical division of labor.

Table 1 *Theoretical Division of Labor in the Proposed Framework*

Theory	Core Question Addressed	Framework Role	Key Citations
Resource-Based View	<i>Why</i> do certain resources matter for digital transformation?	Explains the selection and bundling of the five digital resource antecedents (IVs)	Barney (1991); Grant (1996)
Dynamic Capabilities Theory	<i>How</i> do static resources become competitive advantages?	Explains enterprise innovation as the mediating mechanism converting digital inputs to competitive outputs	Teece et al. (1997); Teece (2018); Helfat & Peteraf (2018)
Strategic Cognition Theory	<i>Under what conditions</i> does innovation generate competitiveness?	Explains organizational cognition as the moderating boundary condition	Gavetti (2005); Kaplan & Tripsas (2021); Kaplan (2008)

The RBV occupies the left side of the conceptual framework, providing the theoretical rationale for why the five independent variables are jointly necessary as a resource bundle. Without the full complement of technological, strategic, financial, human, and leadership resources, the enterprise lacks the minimum resource endowment to initiate meaningful digital transformation. The DCT occupies the center of the framework, explaining why enterprise innovation is the essential mediating mechanism that converts these static resource stocks into dynamic competitive value. Innovation processes—product, process, market, and behavioral—represent the dynamic reconfiguration activities through which dormant digital resources are activated and deployed for competitive advantage (Teece, 2018). Strategic Cognition Theory occupies the right side of the framework, specifying the boundary conditions under which the innovation-competitiveness conversion succeeds or fails. Organizational cognition operates as the final frictional or catalytic force that either amplifies or attenuates the competitive returns from innovation activity (Kaplan & Tripsas, 2008).

This three-theory integration generates a more nuanced and process-oriented understanding of digital transformation than any single theory could provide alone. The RBV alone would leave unanswered the question of how resources generate value in dynamic environments. The DCT alone would neglect the cognitive conditions that determine whether dynamic reconfiguration succeeds. Strategic Cognition Theory alone would lack grounding in the resource and capability foundations of competitive advantage. Together, these three theories provide a comprehensive architecture for understanding the full journey from digital readiness to enterprise competitiveness, specifying what resources matter, how they create value, and under what conditions value creation is achieved.

3. Literature Review

This section reviews the extant literature on each construct in the proposed framework. Consistent with the theoretical architecture presented above, the review is organized thematically around the dependent variable (enterprise competitiveness), the five independent variables (the digital resource bundle), the mediating variable (enterprise innovation), and the moderating variable (organizational cognition). For each construct, the review traces the theoretical trajectory from foundational definitions to contemporary operationalizations, identifies key empirical findings, and highlights limitations that the proposed framework seeks to address.

3.1 Enterprise Competitiveness (Dependent Variable)

Enterprise competitiveness represents the overarching dependent variable in the proposed framework, defined as the capacity of a firm to achieve and sustain market advantage through superior performance across multiple competitive dimensions (Porter, 1985; Sigalas et al., 2013). The conceptualization of competitiveness has undergone substantial theoretical evolution, moving from early industrial-era conceptions focused on economies of scale and cost

minimization toward contemporary conceptualizations that emphasize digital responsiveness, ecosystem agility, and continuous strategic renewal (Nambisan et al., 2019; Teece, 2018).

Porter (1985) laid the foundational groundwork by conceptualizing competitiveness as the firm's capacity to deliver lasting advantage through the strategic management of competitive forces—buyer power, supplier power, threat of substitutes, and rivalry. This external market-positioning perspective was subsequently enriched by Prahalad and Hamel (1990), who introduced the concept of core competencies, arguing that sustainable competitiveness derives from the organization's learning capacity and its ability to orchestrate diverse production skills and technology streams. The RBV subsequently reframed competitiveness as a function of internal resource endowments, with Grant (1996) emphasizing that firms build long-term advantage through unique, valuable, inimitable resources rather than market positioning alone.

As business environments became increasingly volatile, Teece, Pisano, and Shuen (1997) reconceptualized competitiveness in terms of dynamic capabilities—the ability to integrate, reorganize, and reconfigure internal and external competencies in response to rapidly changing market conditions. In the contemporary digital era, this dynamic perspective has become dominant. Competitiveness is now understood as a multidimensional construct encompassing cost advantage, differentiation, market responsiveness, customer satisfaction, and financial performance (Sigalas et al., 2013). Bhawsar and Chattopadhyay (2015) and Acquaah and Agyapong (2015) confirm that competitiveness in modern markets comprises ongoing innovation capacity, product quality, brand image, market share, and environmental responsiveness. The present framework operationalizes enterprise competitiveness across five dimensions: cost advantage, product differentiation, speed of market response, customer satisfaction, and financial performance (adapted from Porter, 1985; Sigalas et al., 2013), reflecting the comprehensive nature of competitive advantage in the digitally-transformed service economy.

The evolution of competitiveness from a static, industrial-era construct to a dynamic, digitally-enabled capability has profound implications for SME research. In hyper-competitive environments such as Beijing's service sector, where product lifecycles are compressed and customer loyalty is ephemeral, the capacity for continuous strategic renewal—rather than the accumulation of fixed resource stocks—has become the defining determinant of competitive survival (Chin et al., 2022; Klein & Todesco, 2021).

3.2 Digital Transformation Antecedents (Independent Variables)

3.2.1 IT Capability

IT capability refers to the overall technical competency of an enterprise to accommodate its business operations through three distinct dimensions: IT infrastructure, IT human resources, and IT systems integration (Bharadwaj, 2000; Chen et al., 2010). Bharadwaj (2000) first conceptualized IT capability as the capacity of an organization to mobilize, deploy, and manage IT resources effectively in conjunction with other organizational resources to achieve strategic goals. Wade and Hulland (2004) subsequently operationalized IT capability as a multidimensional construct encompassing IT infrastructure, IT human resources, and IT management capabilities that jointly generate competitive advantage in technologically dynamic environments.

The IT infrastructure dimension concerns the tangible technological assets—hardware, software, network structures, and data processing centers—that provide the foundational platform for organizational information processing and communication (Tippins & Sohi, 2003). Cloud computing has emerged as a particularly transformative infrastructural element, enabling SMEs to access enterprise-level computing resources without prohibitive capital investment (Mkhize et al., 2025). The IT human resource dimension encompasses the professional knowledge, technical abilities, and innovative readiness of organizational staff to develop, implement, and optimize IT systems (Wade & Hulland, 2004). The IT systems integration dimension reflects the capacity to achieve seamless data sharing and process coordination across diverse business systems, including Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), and Supply Chain Management (SCM) platforms (Sebastian et al., 2017).

The competitive benefits of strong IT capabilities have been extensively documented. IT capabilities enhance innovation capacity and customer service quality (Gupta & George, 2016), enable real-time data analytics that transform customer relationship management (Jabado & Jallouli, 2024), streamline resource allocation and reduce overhead costs (Bouwman et al., 2018), and facilitate the development of responsive, interactive business ecosystems (Priyono et al., 2020). However, the vast majority of this empirical evidence derives from large, resource-rich multinational firms, leaving a critical gap regarding whether IT capability frameworks are viable in the highly constrained environments of growth-oriented service SMEs (Hafeez et al., 2025).

3.2.2 Digital Transformation Strategy

Digital Transformation Strategy (DTS) represents the organizational blueprint for leveraging digital technologies to create new business models, enhance customer experiences, and improve operational efficiency (Vial, 2019). Bharadwaj et al. (2013) first theorized DTS as a digital business strategy that intrinsically aligns IT competencies with overall business goals to generate sustainable value. Matt et al. (2015) subsequently conceptualized DTS as a systematic approach governing the adoption of disruptive technologies, deep business process reengineering, and corresponding changes in management style, corporate culture, and organizational structures.

The contemporary literature operationalizes DTS across three critical dimensions: strategic orientation, customer focus, and business process innovation (Matt et al., 2015; Warner & Wäger, 2019). Strategic orientation encompasses top-management commitment, clear digital vision, and sustained resource allocation (Ziyadin et al., 2020). Customer focus reflects the philosophical shift from product-centricity to customer-centricity, involving the deployment of digital tools for deep customer understanding and personalized service delivery (Hanelt et al., 2021). Business process innovation involves radical restructuring of internal processes through automation, data-driven decision-making, and cross-departmental digital collaboration (Soto Setzke et al., 2023).

Empirical research demonstrates that effective DTS positively impacts operational and competitive effectiveness through multiple pathways. Cloud computing and big data analytics enhance supply chain visibility and production scheduling (Verhoef et al., 2021), while advanced CRM systems enable personalized offerings that deepen data-based customer connections (Sebastian et al., 2017). However, a critical contextual gap persists: recent systematic reviews indicate that SMEs fail disproportionately in developing and implementing complex integrative digital strategies due to financial constraints and narrow managerial mindsets, often becoming trapped in fragmented digitalization initiatives that consume capital without producing sustainable benefits (Ben Slimane et al., 2022).

3.2.3 Technology Investment

Technology investment refers to the intentional channeling of financial and organizational resources toward the acquisition, integration, and development of contemporary digital infrastructures and applications (Chakravarty et al., 2013; Teece, 2018). In the digital economy, technology investment has transcended its traditional status as an operational overhead to become a central strategic process determining innovation capacity, work efficiency, and competitive positioning (Valášková et al., 2025).

The literature operationalizes technology investment across three interdependent dimensions: IT budget investment, system upgrades, and new technology updates (Aboelmaged, 2018; Chakravarty et al., 2013). IT budget investment reflects the scale and stability of financial commitment to the organization's overall technological vision (Kraus et al., 2022). System upgrades involve investments in legacy infrastructure modernization, including server migration, network modernization, and cybersecurity enhancement (Sebastian et al., 2017). New technology updates represent the disruptive capital allocated to the exploration, trial, and acquisition of advanced tools such as artificial intelligence, blockchain, and 5G communications (Hanelt et al., 2021).

The theoretical expectation is that sustained technology investment generates competitive returns through both internal and external pathways. Internally, automation and smart process investments enhance production efficiency and reduce operational costs. Externally, investments in innovative CRM systems and predictive analytics provide firms with accurate, timely information about evolving customer needs, enabling dynamic marketing strategy adjustments and personalized service delivery (Sebastian et al., 2017; Wamba et al., 2017). However, the literature also documents a “paradoxical threshold” in technology investment: excessive or improperly oriented digitalization can be destructive to firm performance, particularly for SMEs that lack the organizational slack to absorb implementation failures (Chen et al., 2024). This paradox underscores the critical importance of understanding the mediating and moderating mechanisms that determine whether technology investments generate competitive returns or become catastrophic sunk costs.

3.2.4 Leadership Quality

Leadership quality in the digital transformation context refers to the complex of knowledge, skills, and strategic actions that executives deploy to influence, inspire, and direct organizational change (Northouse, 2022). The present framework operationalizes leadership quality through the Multifactor Leadership Questionnaire (MLQ) framework developed by Avolio and Bass (2004) and refined by Bass and Riggio (2006), which conceptualizes leadership across three dimensions: transformational, transactional, and passive/avoidant leadership.

Transformational leadership—the most extensively studied dimension—is characterized by idealized influence (the capacity to articulate a compelling organizational vision), inspirational motivation (the ability to inspire and intellectually stimulate followers), and individualized consideration (the provision of personalized developmental attention to subordinates) (Bass & Riggio, 2006). In the digital transformation context, transformational leaders create psychological safety that enables employees to engage with disruptive technologies without fear, foster cultures of intellectual stimulation that encourage experimentation, and provide the strategic vision necessary to navigate technological uncertainty (Matsunaga, 2024; Tagscherer & Carbon, 2025). Transactional leadership complements transformational leadership by maintaining operational stability through contingent reward systems and active management-by-exception, ensuring baseline efficiency during turbulent change (Gunduz Cekmecelioglu et al., 2025). Passive or avoidant leadership represents a destructive absence of leadership intervention, resulting in missed strategic opportunities, resource misalignment, and rapid competitive marginalization (Wang et al., 2021).

The evolution of leadership theory in the digital age has produced the concept of “digital leadership,” which combines traditional transformational qualities with technological acuity—the capacity to interpret data, predict technological trends, and orchestrate organizational change in digital environments (Schrage et al., 2021). Teece, Peteraf, and Leih (2016) argue that in environments of extreme uncertainty, the long-term viability of any organization is determined by the risk appetite, insight level, and decisive action capacity of its leaders. For SMEs, where the cognitive orientations of a single founder or CEO often determine strategic direction, leadership quality is not merely one factor among many but the orchestrating resource that coordinates all other digital transformation activities (Loonam et al., 2018).

3.2.5 Employee Digital Skills

Employee digital skills refer to the overall capacity of workers to effectively, innovatively, and safely apply digital technologies, tools, and platforms to work tasks, problem-solving, and business innovation (van Laar et al., 2017). The present framework operationalizes employee digital skills through the European Digital Competence Framework (DigComp), refined by Vuorikari et al. (2016) and Falloon (2020), which identifies four quantifiable dimensions: information literacy, communication and collaboration, digital content creation, and digital safety.

Information literacy encompasses the capacity to critically analyze, efficiently manage, and organize large volumes of online data, deriving valuable operational insights for decision-making (Muro et al., 2017). Communication and collaboration skills enable seamless teamwork, issue resolution, and innovation in virtual or hybrid work environments (van Laar et al., 2017). Digital content creation reflects the ability to use standard and advanced digital applications to produce professional outputs and creative workflows (Vuorikari et al., 2016). Digital safety encompasses awareness and operational competence in organizational cybersecurity measures, including data privacy protection, password management, and fraud prevention (Vuorikari et al., 2016).

The competitive significance of employee digital skills extends far beyond operational competence. Employee digital skills can be understood as key micro-foundations of organizational absorptive capacity—the ability to recognize, assimilate, and apply external technological knowledge. Employees with advanced digital capabilities function as frontline organizational sensors, identifying market threats and opportunities in real time and translating technical capabilities into process innovations that reduce structural marginal costs (Kraus et al., 2021). In the SME context, where dedicated R&D departments are typically absent, the bottom-up innovation potential of digitally skilled employees becomes the primary engine of competitive differentiation (Radicić & Petković, 2023). However, Zervas and Stiakakis (2025) document a catastrophic digital divide in the SME segment: independent SMEs suffer drastic and enduring shortages of high-end digital talent because they cannot compete with larger firms on salary, benefits, and stock options, creating a paralyzing operational quandary wherein complex digital transformation plans must be executed with grossly under-skilled workforces.

3.3 Enterprise Innovation as Mediator

Enterprise innovation represents the mediating variable in the proposed framework, defined as the organization’s proactive capacity to enhance competitive advantage and market responsiveness through the introduction of new technologies, products, services, processes, and business models (Schumpeter, 1934; Wang & Ahmed, 2004). The conceptual foundation of enterprise innovation rests on Schumpeter’s (1934) seminal concept of “creative destruction,” which positions innovation as the fundamental driver of economic growth through the recombination of existing resources into novel configurations.

The present framework operationalizes enterprise innovation across four dimensions adapted from Wang and Ahmed (2004): product innovation (the ability to introduce new or substantially improved goods and services), process innovation (the internal improvement of production and operation processes to eliminate waste and enhance efficiency), market innovation (the capacity to identify and capture new market segments through novel marketing channels and brand-building approaches), and behavioral innovation (the organizational culture's tolerance for risk and capacity to convert abstract concepts into tangible strategic actions). This four-dimensional operationalization captures both the external market-facing and internal organizational aspects of innovation, providing a comprehensive conceptualization of the innovation process in digitally-transforming SMEs.

The positioning of enterprise innovation as a mediator is theoretically grounded in the DCT perspective, which holds that digital resources do not directly generate competitive advantage but must be dynamically reconfigured through innovation processes to create value (Helfat & Martin, 2015; Teece, 2014). Singh et al. (2021) demonstrate that increased IT cooperation and data-driven capabilities remain idle until effectively mediated by enterprise innovation, which serves as the ultimate conduit for transforming digital inputs into sustainable competitive advantage. Chen and Kim (2023) substantiate this theoretical necessity, demonstrating that the purported advantages of digital resources are solely achieved through the mediating channel of active innovation factors. Merín-Rodríguez et al. (2024) provide seminal empirical evidence that business model innovation completely mediates the relationship between digital transformation initiatives and financial performance in innovative SMEs.

The innovation mediation mechanism is particularly critical in the SME context. Unlike large multinational corporations that can absorb temporary competitive setbacks through financial reserves and diversified operations, SMEs face existential innovation imperatives: those that fail to produce substantive innovation experience significantly greater mortality rates and rapid market marginalization (Destefanis et al., 2024). For service SMEs in hyper-competitive environments such as Beijing, continuous aggressive innovation is the sole viable strategic process for gaining defensible competitive advantage (Huang et al., 2020).

3.4 Organizational Cognition as Moderator

Organizational cognition refers to the strategic management function encompassing the skills an organization deploys for sensing, interpreting, and utilizing information to adjust appropriately to external environmental changes (Helfat & Peteraf, 2015; Teece, 2018). The conceptual origins of organizational cognition trace to Weick's (1995) sensemaking theory and Walsh's (1995) elaboration of shared mental models at the organizational level. Gavetti and Levinthal (2000) positioned organizational cognition as the primary interpretative framework explaining how organizations navigate competitive landscapes, evaluate strengths and weaknesses, and make pivotal strategic decisions.

The present framework operationalizes organizational cognition across four dimensions synthesized from Teece (2018) and Helfat and Peteraf (2015): environmental sensing (the enterprise's acute awareness of external technological trends, market opportunities, and competitive threats), information processing (the ability to absorb, integrate, and analyze large streams of internal and external data without overload), strategic response (the capacity to make rapid, adaptive decisions and reconfigure internal systems when opportunities or threats are detected), and digital acuity (the organization's proactive learning orientation toward disruptive digital paradigm shifts). This four-dimensional conceptualization captures both the cognitive structures (shared assumptions, mental maps) and shared cognition (knowledge, beliefs, team consensus) that collectively determine how organizations perceive and respond to digital transformation imperatives (Helfat & Peteraf, 2015; Kaplan, 2008).

The moderating role of organizational cognition addresses a critical theoretical question: why do similarly-resourced firms, pursuing similar innovation activities, achieve divergent competitive outcomes? The answer, according to Strategic Cognition Theory, lies in the cognitive configurations of organizational leadership (Kaplan & Tripsas, 2008). Firms with rigid, path-dependent, or cognitively biased leadership—characterized by confirmation bias, overconfidence, or groupthink—systematically misinterpret market signals and undermine their own innovative efforts, converting potential competitive advantages into tragic sunk costs (Tripsas & Gavetti, 2000). Conversely, firms with cognitively agile leadership—characterized by flexible mental models, rapid sensemaking, and digital acuity—are able to amplify the competitive returns from innovation by ensuring timely market alignment and rapid strategic adaptation (Malik et al., 2025).

The cognitive moderator is exponentially more critical in the SME context. Unlike large multinational corporations with extensive financial cushions that can absorb the costs of erroneous innovation, SMEs operate on incredibly narrow error margins, and their cognitive systems effectively embody the total limit of their competitive

capabilities (Chen et al., 2025; Ojha et al., 2023). When organizational cognition fails in an SME, even technically flawless innovations can produce complete market flops, transforming potential competitive advantages into accelerants of corporate bankruptcy.

4. Framework Development and Propositions

4.1 Conceptual Framework Description

Drawing upon the theoretical integration of RBV, DCT, and Strategic Cognition Theory, and informed by the comprehensive literature review presented above, this paper proposes a moderated-mediation conceptual framework explaining how digital readiness translates into enterprise competitiveness among growth-oriented service SMEs. The framework consists of eight constructs arranged in a theoretically-coherent structural architecture.

The left side of the framework comprises five independent variables representing the digital resource bundle: IT Capability, Digital Transformation Strategy, Technology Investment, Leadership Quality, and Employee Digital Skills. These five variables are positioned as the pillars of digital readiness, grounded in the RBV logic that sustainable competitive advantage requires a synergistic combination of complementary technological, strategic, financial, human, and leadership resources (Barney, 1991; Grant, 1996).

The center of the framework features Enterprise Innovation as the sole mediating variable—the key conversion engine that transforms static digital inputs into dynamic competitive outputs. Grounded in DCT, this mediating position reflects the theoretical proposition that digital resources are inert until dynamically reconfigured through innovation processes encompassing product, process, market, and behavioral dimensions (Teece, 2018; Teece et al., 1997).

The right side of the framework positions Enterprise Competitiveness as the dependent variable—the ultimate outcome representing the firm's capacity to achieve sustainable market advantage. Enterprise Competitiveness is operationalized across five dimensions: cost advantage, product differentiation, speed of market response, customer satisfaction, and financial performance (Porter, 1985; Sigalas et al., 2013).

Finally, Organizational Cognition is positioned as the moderating variable, interacting with the innovation-to-competitiveness pathway. Grounded in Strategic Cognition Theory, this moderating position reflects the theoretical proposition that the competitive effectiveness of innovation is contingent upon the cognitive agility of the organization—its capacity for sensing, processing, responding, and maintaining digital acuity (Gavetti, 2005; Kaplan & Tripsas, 2008).

The framework generates twelve directional propositions: five direct effect propositions (P1–P5) linking each digital resource to competitiveness, one direct effect proposition (P6) for innovation, five mediation propositions (P7–P11) specifying the innovation-mediated pathways, and one moderation proposition (P12) for the cognitive boundary condition.

4.2 Direct Effect Propositions (P1–P5)

Drawing upon the RBV, each of the five digital resource antecedents represents a distinct but complementary component of the theoretically-derived resource bundle necessary for SME digital transformation. The following direct effect propositions are advanced:

Proposition 1 (P1): IT capabilities have a positive direct effect on enterprise competitiveness among growth-oriented service SMEs.

Theoretical justification: IT capabilities—encompassing IT infrastructure, IT human resources, and IT systems integration—constitute a strategically valuable resource that is difficult for competitors to imitate because its effectiveness depends on firm-specific configurations and cumulative organizational learning (Bharadwaj, 2000; Wade & Hulland, 2004). Strong IT capabilities enable firms to streamline operations, enhance customer relationship management, accelerate data-driven decision-making, and develop responsive business ecosystems (Gupta & George, 2016; Jabado & Jallouli, 2024). In the SME context, cloud computing and scalable digital infrastructures have reduced the capital barriers to IT capability development, making this resource increasingly accessible to resource-constrained firms (Mkhize et al., 2025).

Proposition 2 (P2): Digital transformation strategy has a positive direct effect on enterprise competitiveness among growth-oriented service SMEs.

Theoretical justification: A cohesive digital transformation strategy—encompassing strategic orientation, customer focus, and business process innovation—provides the rare and inimitable organizational asset of strategic alignment that ensures technological investments are coordinated with long-term business objectives (Bharadwaj et al., 2013; Matt et al., 2015). Firms with well-developed DTS are able to proactively follow technological change rather than defensively respond to market shocks, systematically align internal resources toward competitive objectives, and develop novel value propositions through business model innovation (Correani et al., 2021; Vial, 2019). For SMEs operating in hyper-competitive environments, a systematic strategic roadmap is essential for ensuring that fragmented digitalization initiatives cohere into sustainable competitive benefits (Ben Slimane et al., 2022).

Proposition 3 (P3): Technology investment has a positive direct effect on enterprise competitiveness among growth-oriented service SMEs.

Theoretical justification: Technology investment—encompassing IT budget allocation, system upgrades, and new technology acquisition—constitutes the formative financial resource that enables the acquisition of foundational digital assets (Aboelmaged, 2018; Chakravarty et al., 2013). From the RBV perspective, sustained and strategically-articulated technology investment creates resource stocks that are difficult to duplicate, particularly when investment patterns reflect firm-specific strategic priorities and operational requirements. Stable IT budgets ensure continuity of digital transformation initiatives, system upgrades enhance operational reliability and data processing capacity, and investments in frontier technologies enable the development of disruptive service innovations (Hanelt et al., 2021; Kraus et al., 2022).

Proposition 4 (P4): Leadership quality has a positive direct effect on enterprise competitiveness among growth-oriented service SMEs.

Theoretical justification: Leadership quality—encompassing transformational, transactional, and passive leadership behaviors—represents the orchestrating resource that coordinates the entire digital transformation effort (Avolio & Bass, 2004; Bass & Riggio, 2006). Transformational leaders provide the strategic vision, psychological safety, and intellectual stimulation necessary for employees to engage constructively with disruptive technologies (Matsunaga, 2024; Tagscherer & Carbon, 2025). Transactional leaders maintain operational stability through contingent reward systems that ensure baseline efficiency during change (Gunduz Cekmecelioglu et al., 2025). In the SME context, where the cognitive orientations of a single founder or CEO disproportionately influence strategic direction, leadership quality is the resource that determines whether other digital investments are effectively coordinated or wasted through mismanagement (Jabbour Al Maalouf et al., 2025; Loonam et al., 2018).

Proposition 5 (P5): Employee digital skills have a positive direct effect on enterprise competitiveness among growth-oriented service SMEs.

Theoretical justification: Employee digital skills—encompassing information literacy, communication and collaboration, digital content creation, and digital safety—constitute the human capital resource that converts technological potential into operational reality (Falloon, 2020; Vuorikari et al., 2016). From the RBV perspective, a digitally skilled workforce is rare and difficult to imitate because it reflects cumulative investments in training, organizational culture, and experiential learning. Employees with advanced digital capabilities function as frontline sensors for market opportunities and threats, contribute to bottom-up process innovations, and enable rapid strategic adaptation (Kraus et al., 2021). For SMEs, which typically lack dedicated R&D departments, the innovation potential of digitally skilled employees is particularly critical (Radicic & Petkovic, 2023).

4.3 Mediation Proposition (P6)

Proposition 6 (P6): Enterprise innovation has a positive direct effect on enterprise competitiveness among growth-oriented service SMEs.

Theoretical justification: Enterprise innovation—encompassing product, process, market, and behavioral innovation—represents the active competitive engine that directly creates market advantage (Schumpeter, 1934; Wang & Ahmed, 2004). Product innovation enables firms to differentiate offerings and command price premiums; process innovation generates structural cost advantages and quality improvements; market innovation facilitates entry into untapped segments; and behavioral innovation creates the organizational culture of risk-taking and experimentation necessary for sustained competitive dynamism (Denning, 2018; Osiyevskyy & Dewald, 2015). For SMEs in hyper-competitive service environments, innovation is not a discretionary strategic option but an existential imperative: firms that fail to innovate consistently experience significantly higher mortality rates and rapid market marginalization (Destefanis et al., 2024).

4.4 Mediation Propositions (P7–P11)

Drawing upon DCT, the following propositions specify that the direct effects of each digital resource on competitiveness are mediated through enterprise innovation:

Proposition 7 (P7): Enterprise innovation mediates the positive relationship between IT capabilities and enterprise competitiveness among growth-oriented service SMEs.

Theoretical justification: IT capabilities do not automatically generate competitive advantage; rather, they provide the computational infrastructure, interconnection, and data collection capabilities that must be actively exploited through innovation to create market value (Chen & Kim, 2023; Singh et al., 2021). Advanced data analytics and AI capabilities open new innovation pathways by enabling firms to anticipate consumer preferences and reconfigure offerings proactively (Sjödén et al., 2020). Integrated IT platforms facilitate process innovation by eliminating analog data silos and automating workflows (Chen & Kim, 2023). Without active innovation, IT investments remain dormant sunk costs rather than competitive assets (Khin & Ho, 2019).

Proposition 8 (P8): Enterprise innovation mediates the positive relationship between digital transformation strategy and enterprise competitiveness among growth-oriented service SMEs.

Theoretical justification: A digital transformation strategy represents a strategic blueprint, not an automatic generator of financial returns (Correani et al., 2021). The strategic orientation dimension triggers consistent internal innovation capacity; the customer focus dimension compels market and service innovations; and the business process innovation dimension directly drives process optimization and cost reduction (Hanelt et al., 2021; Merín-Rodríguez et al., 2024). Without this innovation-mediated conversion, digital strategy remains an unmonetized organizational aspiration (Wang & Zhang, 2025).

Proposition 9 (P9): Enterprise innovation mediates the positive relationship between technology investment and enterprise competitiveness among growth-oriented service SMEs.

Theoretical justification: Sheer financial expenditure on technology does not create competitive advantage; rather, technology investment must be activated through innovation to generate returns (Chen et al., 2024). Financial allocations to new technologies drive product and market innovation by enabling the development of differentiated service offerings. System upgrade investments facilitate process innovation by automating workflows and eliminating inefficiencies (Chen & Kim, 2023). Without this innovation-mediated conversion, technology investments become catastrophic sunk costs, particularly for resource-constrained SMEs (Teng et al., 2022).

Proposition 10 (P10): Enterprise innovation mediates the positive relationship between leadership quality and enterprise competitiveness among growth-oriented service SMEs.

Theoretical justification: Executive vision, no matter how brilliant, does not automatically create market dominance (Tran et al., 2025). Transformational leadership drives behavioral, product, and market innovation by creating psychological safety and stimulating intellectual exploration (Tagscherer & Carbon, 2025). Transactional leadership fuels process innovation by maintaining operational efficiency and clear performance targets (Mutabelezi & Sethibe, 2023). Without this innovation-mediated conversion, leadership remains inspirational but strategically ineffective. In the SME context, where the founder's cognitive orientation determines the firm's innovative trajectory, this mediation mechanism is particularly critical (Al-Sharif et al., 2023).

Proposition 11 (P11): Enterprise innovation mediates the positive relationship between employee digital skills and enterprise competitiveness among growth-oriented service SMEs.

Theoretical justification: Digital skills represent potential energy, not kinetic competitive force (Chen & Kim, 2023; Merín-Rodríguez et al., 2024). Employees with strong data analytics capabilities translate their skills into process innovations that reduce costs and enhance quality (Kraus et al., 2021). Digital collaboration competencies enable the knowledge-sharing and cross-functional interaction necessary for organizational innovation (van Laar et al., 2017). Without this innovation-mediated conversion, skilled employees remain an underutilized asset, and the firm fails to capture the competitive potential of its human capital investment.

4.5 Moderation Proposition (P12)

Proposition 12 (P12): Organizational cognition positively moderates the relationship between enterprise innovation and enterprise competitiveness among growth-oriented service SMEs, such that the positive effect of innovation on competitiveness is stronger when organizational cognition is high.

Theoretical justification: The conversion of innovation into competitive advantage is not automatic but is fundamentally shaped by the cognitive orientation of the organization (Kaplan & Tripsas, 2008). Firms with high organizational cognition—characterized by acute environmental sensing, rapid information processing, adaptive strategic response, and digital acuity—are able to ensure that innovative outputs align precisely with market needs, reach the right target demographics at the optimal time, and are supported by coherent resource allocation (Malik et al., 2025). Conversely, firms with rigid or cognitively biased leadership systematically misinterpret market signals, misallocate resources, and convert technically sound innovations into competitive failures (Tripsas & Gavetti, 2000). This moderating role is exponentially more consequential for SMEs, where narrow error margins and concentrated leadership make cognitive agility the ultimate determinant of innovation success or failure (Chen et al., 2025; Kaplan, 2008).

4.6 Summary of Propositions

Table 2 Summary of the Twelve Propositions

Proposition	Path	Nature	Theoretical Basis
P1	IT Capability → Enterprise Competitiveness	Direct effect	RBV: IT as valuable, rare, inimitable resource (Bharadwaj, 2000; Wade & Hulland, 2004)
P2	Digital Transformation Strategy → Enterprise Competitiveness	Direct effect	RBV: Strategic alignment as organizational asset (Bharadwaj et al., 2013; Matt et al., 2015)
P3	Technology Investment → Enterprise Competitiveness	Direct effect	RBV: Financial capital as foundational resource (Aboelmaged, 2018; Chakravarty et al., 2013)
P4	Leadership Quality → Enterprise Competitiveness	Direct effect	RBV: Leadership as orchestrating resource (Avolio & Bass, 2004; Bass & Riggio, 2006)
P5	Employee Digital Skills → Enterprise Competitiveness	Direct effect	RBV: Human capital as competitive resource (Falloon, 2020; Vuorikari et al., 2016)
P6	Enterprise Innovation → Enterprise Competitiveness	Direct effect	DCT: Innovation as competitive engine (Schumpeter, 1934; Wang & Ahmed, 2004)
P7	IT Capability → Enterprise Innovation → Enterprise Competitiveness	Mediation	DCT: Dynamic reconfiguration of IT resources (Chen & Kim, 2023; Singh et al., 2021)
P8	DTS → Enterprise Innovation → Enterprise Competitiveness	Mediation	DCT: Strategy activation through innovation (Correani et al., 2021; Merín-Rodríguez et al., 2024)
P9	Technology Investment → Enterprise Innovation → Enterprise Competitiveness	Mediation	DCT: Financial conversion through innovation (Teng et al., 2022)
P10	Leadership Quality → Enterprise Innovation → Enterprise Competitiveness	Mediation	DCT: Vision translation through innovation (Al-Sharif et al., 2023; Tagscherer & Carbon, 2025)

P11	Employee Digital Skills → Enterprise Innovation → Enterprise Competitiveness	Mediation	DCT: Human capital activation through innovation (van Laar et al., 2017; Radicic & Petkovic, 2023)
P12	Organizational Cognition moderates (Innovation → Competitiveness)	Moderation	Strategic Cognition: Cognitive agility as boundary condition (Kaplan & Tripsas, 2008; Kaplan, 2008)

5. Discussion

5.1 Theoretical Implications

The proposed moderated-mediation framework makes three specific theoretical contributions to the digital transformation and strategic management literature.

Contribution 1: A Unified, Theoretically-Derived Resource Bundle. The framework advances a theoretically-coherent resource bundle for conceptualizing digital readiness in service SMEs, moving beyond the fragmented, single-variable approach that characterizes much of the existing literature. By identifying five interdependent digital resources—IT capability, digital transformation strategy, technology investment, leadership quality, and employee digital skills—and grounding their selection in the VRIN criteria of the RBV, the framework provides a comprehensive operationalization of digital readiness that reflects the theoretically-mandated complementarity among technological, strategic, financial, human, and leadership resources (Barney, 1991; Grant, 1996). This approach responds directly to the criticism that existing studies “simply pick an individual technological determinant without a unifying, overarching theoretical explanation” (Rizana et al., 2025; Sagala & Ori, 2024). The resource bundle framework also explains why the digitalization paradox occurs: when firms possess incomplete resource configurations—such as IT investment without employee skills, or visionary leadership without strategic roadmaps—the digital transformation effort collapses, producing wasted capital and organizational cynicism (Shao et al., 2025; Teng et al., 2022).

Contribution 2: Decomposing the Value Creation Black Box. The framework illuminates the mechanism through which digital resources are converted into competitive outcomes by positioning enterprise innovation as the pivotal mediating engine. Drawing upon DCT, the framework argues that the five digital resources do not directly produce competitiveness; rather, they must be dynamically reconfigured through innovation processes—product, process, market, and behavioral—to generate tangible competitive benefits (Teece, 2018; Teece et al., 1997). This mediating specification provides a process-oriented explanation that accounts for the digitalization paradox: enterprises that possess digital resources but fail to activate the innovation conversion engine remain burdened by sunk costs without competitive returns (Chen & Kim, 2023; Singh et al., 2021). By systematically decomposing the black box of value creation, the framework reconciles the macro-level observation that digital transformation enhances competitiveness with the micro-level reality that many individual SMEs experience the opposite outcome.

Contribution 3: Integrating Cognitive Boundary Conditions. The framework makes a novel theoretical contribution by integrating organizational cognition as a moderating boundary condition that determines whether innovation translates into competitive advantage. Drawing upon Strategic Cognition Theory, the framework argues that the ultimate effectiveness of innovation is contingent upon the cognitive agility of the enterprise—its capacity for environmental sensing, information processing, strategic response, and digital acuity (Gavetti, 2005; Kaplan & Tripsas, 2008). This integration addresses the striking inconsistency in the SME digitalization literature, where similarly-resourced firms achieve divergent outcomes. By specifying the cognitive conditions under which innovation succeeds or fails, the framework provides a theoretically-grounded explanation for empirical contradictions and identifies cognitive inertia as a critical obstacle to digital transformation success (Kaplan, 2008; Tripsas & Gavetti, 2000). The integration of cognition also bridges the micro-foundations literature in strategic management with the digital transformation literature, demonstrating how individual-level cognitive processes aggregate to shape firm-level competitive outcomes.

5.2 Practical Implications

The framework offers several actionable insights for managers of growth-oriented service SMEs navigating digital transformation.

First, the framework provides a diagnostic tool for assessing digital readiness. Managers can evaluate their firm's resource bundle across the five dimensions—IT capability, digital transformation strategy, technology investment, leadership quality, and employee digital skills—to identify critical gaps that may undermine transformation efforts. The RBV-based logic of the framework suggests that investments in any single resource dimension without corresponding investments in complementary dimensions are likely to produce disappointing returns. A firm that invests heavily in IT infrastructure without developing employee digital skills, for example, is likely to experience the digitalization paradox firsthand.

Second, the framework emphasizes the centrality of innovation as the conversion engine for digital investments. Managers should not assume that technology adoption automatically generates competitive benefits; rather, they must actively design and implement innovation processes that exploit digital resources for product development, process optimization, market expansion, and cultural transformation. This insight suggests that digital transformation budgets should allocate substantial resources to innovation activities—not merely to technology acquisition.

Third, the framework highlights the critical importance of organizational cognition in determining transformation success. Managers should invest in developing cognitive agility—through environmental scanning systems, cross-functional information sharing, rapid decision-making protocols, and continuous digital learning—to ensure that innovative efforts are aligned with market realities and executed with strategic precision. For SME leaders in particular, the framework underscores the need for cognitive self-awareness: rigid mental models, confirmation bias, and strategic myopia can convert technically sound innovations into competitive failures.

5.3 Policy Implications for the Beijing Context

The framework carries specific policy implications for Beijing's service SME sector, where the digitalization paradox is most acutely manifest.

First, government digitalization support programs—such as the SRDI initiative—should move beyond single-dimension subsidies (e.g., technology vouchers) toward integrated resource bundle support that addresses technological, strategic, human capital, and leadership development needs simultaneously. The RBV logic suggests that subsidizing IT infrastructure without corresponding investments in employee training and leadership development is likely to produce disappointing competitive returns.

Second, policy interventions should prioritize innovation capacity-building as the conversion mechanism for digital investments. This could include establishing SME innovation incubators, facilitating access to research and development partnerships, and providing innovation management training that helps firms translate digital resources into marketable products, optimized processes, and new market segments.

Third, the framework suggests that policy makers should invest in cognitive development programs for SME leadership. Executive education focused on digital acuity, environmental sensing, adaptive decision-making, and strategic flexibility could significantly enhance the effectiveness of digital transformation investments by ensuring that SME leaders possess the cognitive capabilities necessary to guide innovation toward competitive success.

6. Conclusion and Future Research

6.1 Summary

This paper has proposed a comprehensive moderated-mediation conceptual framework that integrates the Resource-Based View, Dynamic Capabilities Theory, and Strategic Cognition Theory to explain how digital readiness translates into enterprise competitiveness among growth-oriented service SMEs. The framework identifies five interdependent digital resource antecedents that constitute a theoretically-derived resource bundle, positions enterprise innovation as the pivotal mediating mechanism converting static digital inputs into dynamic competitive outputs, and specifies organizational cognition as the critical boundary condition moderating the innovation-to-competitiveness pathway. Twelve theoretically-grounded propositions have been advanced to guide future empirical research.

The framework makes three specific contributions: (1) a unified resource bundle for SME digital transformation that moves beyond fragmented single-factor analyses; (2) a process-oriented explanation of how digital inputs become competitive outputs through enterprise innovation; and (3) the integration of strategic cognition as a boundary condition that explains why similarly-resourced SMEs achieve divergent competitive outcomes. By addressing these gaps, the framework provides a theoretically-coherent architecture for understanding the digitalization paradox and offers actionable guidance for managers and policymakers seeking to enhance the competitive performance of service SMEs in high-pressure digital environments.

6.2 Limitations

As a purely conceptual paper, this study has several limitations that should be acknowledged. First, the propositions advanced herein are theoretically-derived and require empirical validation before they can be accepted as established findings. Future research must test these propositions using appropriate quantitative methods to confirm, refine, or reject the hypothesized relationships. Second, the framework is developed with specific reference to growth-oriented service SMEs in high-pressure, resource-constrained environments. Its generalizability to other organizational contexts—such as large multinational corporations, manufacturing firms, or SMEs in less competitive environments—requires careful theoretical and empirical assessment. Third, the conceptual nature of the paper means that the proposed relationships are specified at a relatively abstract level; future research should examine the micro-processes through which each proposed mechanism operates in practice.

6.3 Future Research Directions

Several promising directions for future research emerge from this framework.

Empirical Validation. The most immediate priority is empirical testing of the twelve propositions using structural equation modeling (SEM) with a sample of growth-oriented service SMEs. Such research should employ validated measurement instruments for each construct and test both the direct effects, mediation effects, and moderation effects specified in the framework.

Longitudinal Research. The current framework is cross-sectional in nature, capturing relationships at a single point in time. Future research should employ longitudinal designs to examine how the proposed relationships evolve over time, how resource bundles develop and reconfigure, and how cognitive orientations adapt to changing competitive conditions.

Multi-Context Comparative Studies. Future research should test the framework across different national and regional contexts to assess its generalizability and identify context-specific moderators. Comparative studies examining service SMEs in Beijing versus other major Chinese cities, or versus service SME sectors in other countries, would yield valuable insights into how institutional, cultural, and market conditions shape the digital transformation-competitiveness relationship.

Qualitative Micro-Process Studies. Future research should complement quantitative testing with qualitative studies that examine the micro-processes through which digital resources are reconfigured through innovation, and how cognitive orientations shape these reconfiguration processes. In-depth case studies of service SMEs that have successfully or unsuccessfully navigated digital transformation would provide rich empirical grounding for the proposed mechanisms.

Intervention Research. Future research should design and evaluate specific interventions aimed at strengthening the components of the proposed framework. For example, randomized controlled trials examining the effects of integrated resource bundle support (versus single-dimension support) on SME competitiveness would provide powerful evidence for policy design.

REFERENCES

1. Aboelmaged, M. G. (2018). The drivers of sustainable manufacturing practices in Egyptian SMEs and their impact on competitive capabilities: A PLS-SEM model. *Journal of Cleaner Production*, 175, 207–221.
2. Acquah, M., & Agyapong, A. (2015). Competitive strategy and firm performance in micro and small businesses in Ghana: The moderating role of managerial and marketing capabilities. *Africa Journal of Management*, 1(2), 172–193.
3. Al-Sharif, A. M., Ali, M. H., Jaharuddin, N. S., Abdulsamad, A., & Jandab, A. (2023). The role of innovation capability in the relationship between entrepreneurial leadership and innovation performance in the SMEs service industry. *Advances in Social Sciences Research Journal*, 10(1), 264–278. <https://doi.org/10.14738/assrj.101.13802>
4. Avolio, B. J., & Bass, B. M. (2004). Multifactor leadership questionnaire: Manual and sampler set (3rd ed.). Mind Garden.
5. Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120.
6. Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership* (2nd ed.). Psychology Press.
7. Beijing Municipal Bureau of Economy and Information Technology. (2025). 2024 Beijing SME development report. Beijing Municipal Government.
8. Beijing Municipal Bureau of Statistics. (2024). *Beijing statistical yearbook 2024*. China Statistics Press.
9. Ben Slimane, K., Chan, C. M. L., & Cao, D. (2022). Digital transformation of SMEs: A systematic literature review and future research agenda. *Journal of Small Business Management*, 60(6), 1199–1229.
10. Bharadwaj, A. S. (2000). A resource-based perspective on information technology capability and firm performance: An empirical investigation. *MIS Quarterly*, 24(1), 169–196.

11. Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital business strategy: Toward a next generation of insights. *MIS Quarterly*, 37(2), 471–482.
12. Bhawsar, P., & Chattopadhyay, U. (2015). Competitiveness: Review, reflections and directions. *Global Business Review*, 16(4), 665–679.
13. Bouwman, H., Nikou, S., Molina-Castillo, F. J., & de Reuver, M. (2018). The impact of digitalization on business models. *Digital Policy, Regulation and Governance*, 20(2), 105–124. <https://doi.org/10.1108/DPRG-07-2017-0039>
14. Chakravarty, A., Grewal, R., & Sambamurthy, V. (2013). Information technology competencies, organizational agility, and firm performance: Enabling valence. *Information Systems Research*, 24(4), 976–997.
15. Chen, D. Q., Mocker, M., Preston, D. S., & Teubner, A. (2010). Information systems strategy: Reconceptualization, measurement, and implications. *MIS Quarterly*, 34(2), 233–259.
16. Chen, P., & Kim, S. (2023). The impact of digital transformation on innovation performance—The mediating role of innovation factors. *Heliyon*, 9(3), e13916. <https://doi.org/10.1016/j.heliyon.2023.e13916>
17. Chen, X., Zhang, X. E., Cai, Z., & Chen, J. (2024). The non-linear impact of digitalization on the performance of SMEs: A hypothesis test based on the digitalization paradox. *Systems*, 12(4), 139.
18. Chen, Y., Du, H., & Wang, D. (2025). Research on the relationship between executive cognition and innovation performance of SRDI SMEs. *Frontiers in Psychology*, 16, 1493242.
19. Chin, T., Sengupta, S., & Mondal, S. R. (2022). Digital transformation for achieving the UN sustainable development goals: Evaluating the competence of manufacturing SMEs. *Journal of Cleaner Production*, 357, 131768.
20. Clemente-Almendros, J. A., Nicoara-Popescu, D., & Pastor-Sanz, I. (2024). Digital transformation in SMEs: Understanding its determinants and size heterogeneity. *Technology in Society*, 77, 102483.
21. Correani, A., De Massis, A., Frattini, F., Petruzzelli, A. M., & Natalicchio, A. (2021). Implementing a digital strategy: Learning from the experience of three digital transformation projects. *California Management Review*, 63(3), 37–56.
22. Dąbrowska, J., Almpantopoulou, A., Brem, A., Chesbrough, H., Cucino, V., Di Minin, A., ... & Ritala, P. (2022). Digital transformation, for better or worse: A critical multi-level research agenda. *R&D Management*, 52(5), 930–954.
23. Denning, S. (2018). The age of agile: How smart companies are transforming the way work gets done. AMACOM.
24. Destefanis, S., Maietta, O. W., Mazzotta, F., & Parisi, L. (2024). Firm survival and innovation: Direct and indirect effects of knowledge for SMEs. *Economics of Innovation and New Technology*, 33(7), 926–954.
25. Falloon, G. (2020). From digital literacy to digital competence: The teacher digital competency (TDC) framework. *Educational Technology Research and Development*, 68(5), 2449–2472.
26. Gavetti, G. (2005). Cognition and hierarchy: Rethinking the microfoundations of capabilities' development. *Organization Science*, 16(6), 599–617.
27. Gavetti, G., & Levinthal, D. (2000). Looking forward and looking backward: Cognitive and experiential search. *Administrative Science Quarterly*, 45(1), 113–137.
28. Grant, R. M. (1996). Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization Science*, 7(4), 375–387.
29. Gunduz Cekmecelioglu, H., Ozcan, M., Balkas, J., & Candan Cam, F. B. (2025). Transformational or transactional? A comparison of the effects of leadership styles on firm performance and innovation in the Turkish work environment. *SAGE Open*, 15(3), 1–18.
30. Gupta, M., & George, J. F. (2016). Toward the development of a big data analytics capability. *Information & Management*, 53(8), 1049–1064.
31. Hafeez, S., Shahzad, K., Helo, P., & Mubarak, M. F. (2025). Knowledge management and SMEs' digital transformation: A systematic literature review and future research agenda. *Journal of Innovation & Knowledge*, 10(3), 100728.
32. Hanelt, A., Bohnsack, R., Marz, D., & Antunes Marante, C. (2021). A systematic review of the literature on digital transformation: Insights and implications for strategy and organizational change. *Journal of Management Studies*, 58(5), 1159–1197.
33. He, Y. (2023). Beijing keji fuwuye fazhan baogao (2024) [Beijing science and technology service industry development report]. Social Sciences Academic Press.
34. Helfat, C. E., & Martin, J. A. (2015). Dynamic managerial capabilities: Review and assessment of managerial impact on strategic change. *Journal of Management*, 41(5), 1281–1312. <https://doi.org/10.1177/0149206314561301>
35. Helfat, C. E., & Peteraf, M. A. (2015). Managerial cognitive capabilities and the microfoundations of dynamic capabilities. *Strategic Management Journal*, 36(6), 831–850. <https://doi.org/10.1002/smj.2247>
36. Hendrawan, S. A., Chatra, A., Iman, N., Hidayatullah, S., & Suprayitno, D. (2024). Digital transformation in MSMEs: Challenges and opportunities in technology management. *Jurnal Informasi dan Teknologi*, 6(3), 141–149.
37. Hodgkinson, G. P., & Healey, M. P. (2011). The psychological foundations of dynamic capabilities: Reflexion and reflection in strategic management. *Strategic Management Journal*, 32(13), 1500–1516.
38. Huang, J., Li, X., Lu, J., & Lu, H. (2020). Enterprise innovation and competitive advantage: The mediating role of organizational learning. *Chinese Management Studies*, 14(4), 1013–1032.
39. Jabado, R., & Jallouli, R. (2024). Impact of data analytics capabilities on CRM systems' effectiveness and business profitability: An empirical study in the retail industry. *Journal of Telecommunications and the Digital Economy*, 12(1), 427–445. <https://doi.org/10.18080/jtde.v12n1.845>
40. Jabbour Al Maalouf, N., El Achi, S., & Balouza, M. (2025). Transformational leadership, innovation, and performance of SMEs in Europe. *Cogent Business & Management*, 12(1), 2473683.

41. Kaplan, S. (2008). Framing contests: Strategy making under uncertainty. *Organization Science*, 19(5), 729–752. <https://doi.org/10.1287/orsc.1070.0340>
42. Kaplan, S., & Tripsas, M. (2008). Thinking about technology: Applying a cognitive lens to technical change. *Research Policy*, 37(5), 790–805.
43. Khin, S., & Ho, T. C. (2019). Digital technology, digital capability and organizational performance: A mediating role of digital innovation. *International Journal of Innovation Science*, 11(2), 177–195.
44. Klein, V. B., & Todesco, J. L. (2021). COVID-19 crisis and SMEs responses: The role of digital transformation. *Knowledge and Process Management*, 28(2), 117–133.
45. Kraus, S., Durst, S., Ferreira, J. J., Veiga, P., Kailer, N., & Weinmann, A. (2022). Digital transformation in business and management research: An overview of the current status quo. *International Journal of Information Management*, 63, 102466.
46. Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., & Roig-Tierno, N. (2021). Digital transformation: An overview of the current state of the art of research. *SAGE Open*, 11(3), 1–15.
47. Loonam, J., Eaves, S., Kumar, V., & Parry, G. (2018). Towards digital transformation: Lessons learned from traditional organizations. *Strategic Change*, 27(2), 101–109. <https://doi.org/10.1002/jsc.2185>
48. Malik, M., Andargoli, A., Tallon, P., & Wickramasinghe, N. (2025). An organizational sensemaking theorizing of how firms construct digitally enabled strategic agility. *Information & Management*, 62(4), 104130.
49. Marzi, G., Manesh, M. F., Caputo, A., Pellegrini, M. M., & Vlačić, B. (2023). Do or do not: Cognitive configurations affecting open innovation adoption in SMEs. *Technovation*, 119, 102585.
50. Matsunaga, M. (2024). Transformational leadership in a digital era. In *Employee uncertainty over digital transformation: Mechanisms and solutions* (pp. 85–138). Springer.
51. Matt, C., Hess, T., & Benlian, A. (2015). Digital transformation strategies. *Business & Information Systems Engineering*, 57(5), 339–343.
52. Merín-Rodríguez, J., Dasí, À., & Alegre, J. (2024). Digital transformation and firm performance in innovative SMEs: The mediating role of business model innovation. *Technovation*, 134, 103027.
53. Mkhize, A., Mokhothu, K. D., Tshikhotho, M., & Thango, B. A. (2025). Evaluating the impact of cloud computing on SME performance: A systematic review. *Businesses*, 5(2), 23. <https://doi.org/10.3390/businesses5020023>
54. Muro, M., Liu, S., Whiton, J., & Kulkarni, S. (2017). Digitalization and the American workforce. Brookings Institution Report.
55. Mutabelezi, W. M., & Sethibe, T. (2023). A model on the relationship between transformational leadership, transactional leadership, entrepreneurial leadership, and the innovation process. *International Journal of Innovation Management*, 27(7–8), 2350043.
56. Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation and entrepreneurship: Progress, challenges, and key themes. *Research Policy*, 48(8), 103773.
57. Northouse, P. G. (2022). *Leadership: Theory and practice* (9th ed.). Sage Publications.
58. Ojha, D., Patel, P. C., & Parida, V. (2023). Virtual integration in SMEs: The digitalization circuitry of dynamic strategic planning. *International Journal of Information Management*, 73, 102657.
59. Osiyevskyy, O., & Dewald, J. (2015). Explorative versus exploitative business model change: The cognitive antecedents of firm-level responses to disruptive innovation. *Strategic Entrepreneurship Journal*, 9(1), 58–78. <https://doi.org/10.1002/sej.1192>
60. Pham, D. D., Pham, T. T., & Le, T. T. T. (2022). Understanding the determinants of digital transformation in manufacturing firms: Evidence from a developing economy. *Technological Forecasting and Social Change*, 174, 121270.
61. Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. Free Press.
62. Prahalad, C. K., & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68(3), 79–91.
63. Priyono, A., Moin, A., & Putri, V. N. A. O. (2020). Identifying digital transformation paths in the business model of SMEs during the COVID-19 pandemic. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4), 104. <https://doi.org/10.3390/joitmc6040104>
64. Radicic, D., & Petkovic, S. (2023). Impact of digitalization on technological innovations in small and medium-sized enterprises (SMEs). *Technological Forecasting and Social Change*, 191, 122474.
65. Rizana, A. F., Wiratmadja, I. I., & Akbar, M. (2025). Exploring capabilities for digital transformation in the business context: Insight from a systematic literature review. *Sustainability*, 17(9), 4222.
66. Saeedikiya, M., Salunke, S., & Kowalkiewicz, M. (2024). Toward a dynamic capability perspective of digital transformation in SMEs: A study of the mobility sector. *Journal of Cleaner Production*, 439, 140718.
67. Sagala, G. H., & Ori, D. (2024). Toward SMEs digital transformation success: A systematic literature review. *Information Systems and e-Business Management*, 22, 667–719.
68. Schilke, O. (2014). On the contingent value of dynamic capabilities for competitive advantage: The nonlinear moderating effect of environmental dynamism. *Strategic Management Journal*, 35(2), 179–203.
69. Schrage, M., Pring, B., Kiron, D., & Dickerson, D. (2021). Leadership's digital transformation: Leading purposefully in an era of context collapse. *MIT Sloan Management Review and Cognizant*.
70. Schumpeter, J. A. (1934). *The theory of economic development*. Harvard University Press.
71. Sebastian, I. M., Ross, J. W., Beath, C., Mockler, M., Moloney, K. G., & Fonstad, N. O. (2017). How big old companies navigate digital transformation. *MIS Quarterly Executive*, 16(3), 197–213.

72. Shao, Q., Jiang, C., Liou, J. J., Su, P., Yuan, Y., & Dan, Z. (2025). Exploring the influencing factors of digital transformation: Empirical results from SMEs in China. *Managerial and Decision Economics*, 46(4), 2364–2380.
73. Sigalas, C., Economou, V. P., & Georgopoulos, N. B. (2013). Developing a measure of competitive advantage. *Journal of Strategy and Management*, 6(4), 320–342.
74. Singh, N., Vishnani, S., Khandelwal, V., Sahoo, S., & Kumar, S. (2024). A systematic review of paradoxes linked with digital transformation of business. *Journal of Enterprise Information Management*, 37(4), 1348–1373.
75. Singh, S. K., Del Giudice, M., Chierici, R., & Graziano, D. (2021). Green innovation and environmental performance: The role of green transformational leadership and green human resource management. *Technological Forecasting and Social Change*, 162, 120388.
76. Sjödin, D., Parida, V., Jovanovic, M., & Visnjic, I. (2020). Value creation and value capture alignment in business model innovation: A process view on outcome-based business models. *Journal of Product Innovation Management*, 37(2), 158–183. <https://doi.org/10.1111/jpim.12516>
77. Soto Setzke, D., Riasanow, T., Böhm, M., & Krcmar, H. (2023). Pathways to digital service innovation: The role of digital transformation strategies in established organizations. *Information Systems Frontiers*, 25(3), 1017–1037.
78. Tagscherer, F., & Carbon, C. C. (2025). The role of transformational leadership in navigating digital servitization. *Sustainable Technology and Entrepreneurship*, 4(2), 100098.
79. Teece, D. J. (2014). The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms. *Academy of Management Perspectives*, 28(4), 328–352. <https://doi.org/10.5465/amp.2013.0116>
80. Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning*, 51(1), 40–49. <https://doi.org/10.1016/j.lrp.2017.06.007>
81. Teece, D. J., Peteraf, M. A., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy. *California Management Review*, 58(4), 13–35. <https://doi.org/10.1525/cmr.2016.58.4.13>
82. Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.
83. Teng, X., Wu, Z., & Yang, F. (2022). Impact of the digital transformation of small- and medium-sized listed companies on performance: Based on a cost-benefit analysis framework. *Journal of Mathematics*, 2022, Article 1504499.
84. Tippins, M. J., & Sohi, R. S. (2003). IT competency and firm performance: Is organizational learning a missing link? *Strategic Management Journal*, 24(8), 745–761. <https://doi.org/10.1002/smj.337>
85. Tran, Y. T., Chau, T. H. P., & Pham, Q. T. (2025). Transformational leadership and firm performance: The mediating roles of innovation capacity and management accounting systems usage. *Sustainable Futures*, 7, 100988.
86. Tripsas, M., & Gavetti, G. (2000). Capabilities, cognition, and inertia: Evidence from digital imaging. *Strategic Management Journal*, 21(10–11), 1147–1161. [https://doi.org/10.1002/1097-0266\(200010/11\)21:10/11<1147::AID-SMJ128>3.0.CO;2-R](https://doi.org/10.1002/1097-0266(200010/11)21:10/11<1147::AID-SMJ128>3.0.CO;2-R)
87. Valášková, K., Nagy, M., & Juracka, D. (2025). Digital transformation and financial performance: An empirical analysis of strategic alignment in the digital age. *Journal of Enterprising Communities: People and Places in the Global Economy*, 19(5), 1178–1205.
88. van Laar, E., van Deursen, A. J., van Dijk, J. A., & de Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*, 72, 577–588.
89. Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889–901.
90. Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*, 28(2), 118–144. <https://doi.org/10.1016/j.jsis.2019.01.003>
91. Vuorikari, R., Punie, Y., Carretero, S., & Van den Brande, G. (2016). DigComp 2.0: The digital competence framework for citizens. Publications Office of the European Union.
92. Wade, M., & Hulland, J. (2004). The resource-based view and information systems research: Review, extension, and suggestions for future research. *MIS Quarterly*, 28(1), 107–142.
93. Walsh, J. P. (1995). Managerial and organizational cognition: Notes from a trip down memory lane. *Organization Science*, 6(3), 280–321.
94. Wamba, S. F., Gunasekaran, A., Akter, S., Ren, S. J. F., Dubey, R., & Childe, S. J. (2017). Big data analytics and firm performance: Effects of dynamic capabilities. *Journal of Business Research*, 70, 356–365. <https://doi.org/10.1016/j.jbusres.2016.08.009>
95. Wang, C. H., Liu, G. H., & Lee, N. C. A. (2021). Effects of passive leadership in the digital age. *Frontiers in Psychology*, 12, 701047. <https://doi.org/10.3389/fpsyg.2021.701047>
96. Wang, C. L., & Ahmed, P. K. (2004). The development and validation of the organizational innovativeness construct using confirmatory factor analysis. *European Journal of Innovation Management*, 7(4), 303–313.
97. Wang, C. L., Senaratne, C., & Rafiq, M. (2015). Success traps, dynamic capabilities and firm performance: A longitudinal study. *British Journal of Management*, 26(1), 26–44.
98. Wang, S., & Zhang, H. (2025). Digital transformation and innovation performance in small- and medium-sized enterprises: A systems perspective. *Systems*, 13(1), 43.
99. Warner, K. S. R., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. *Long Range Planning*, 52(3), 326–349.

100. Weick, K. E. (1995). Sensemaking in organizations. Sage Publications.
101. Zervas, I., & Stiakakis, E. (2025). HRM strategies for bridging the digital divide: Enhancing digital skills, employee performance, and inclusion. *Administrative Sciences*, 15(7), 267.
102. Ziyadin, S., Doszhan, R., Borodin, A., & Ilyas, A. (2020). The role of digital transformation in achieving sustainable business models. *Entrepreneurship and Sustainability Issues*, 7(4), 2567–2583.