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The Transformation of Competitive Strategy in Data-Rich Markets: Emerging Logics of Advantage in the Digital Economy

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Abstract

The digital economy has fundamentally altered the foundations of competitive strategy, shifting firms from reliance on scarce physical and intangible resources toward data-rich environments where advantage stems from continuous data accumulation, analytics, and platform-mediated interactions. This theory-development article synthesizes recent literature on digital platforms, big data analytics, and ecosystem dynamics to propose new logics of competitive advantage characterized by speed, scale, learning, and connectivity. Traditional resource-based and positioning views are transformed as firms leverage data as a generative resource, platforms as coordination mechanisms, and algorithms for real-time adaptation. The article identifies key mechanisms driving this shift: data-driven resource reconfiguration, network effects amplifying scale advantages, algorithmic competition enabling dynamic strategic adjustment, and ecosystem positioning fostering connectivity. Five theoretical propositions articulate these relationships, culminating in a conceptual model illustrating the evolutionary trajectory from traditional to data-driven strategies. By highlighting feedback loops of continuous learning and adaptation, the framework explains how firms sustain advantage in volatile, data-intensive markets. Contributions include a reconceptualization of competitive logics in the digital era and implications for strategic management in platform-dominated ecosystems.

Keywords Network effects, Competitive strategy, Data-driven advantage, Digital platforms, Algorithmic competition, Ecosystem positioning

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Introduction

The digital economy has reshaped the competitive landscape, moving beyond traditional notions of competitive advantage rooted in resource scarcity and market positioning [1] to environments characterized by data abundance, network effects, and rapid technological change [2-7]. In data-rich markets, firms no longer compete primarily through proprietary assets or cost leadership [5], but through their ability to generate, process, and act on vast streams of data in real time [8-10]. Data is not merely an input into decision-making [1] but becomes a continuously regenerating asset, produced through user interactions, transactions, and system feedback [3]. This

shift redefines the locus of value creation [5], emphasizing data flows and analytics capabilities rather than static resource endowments [7].

This transformation challenges classical strategic theories, such as the resource-based view (RBV), which emphasizes valuable, rare, inimitable, and non-substitutable resources [9], and Porter's five forces, which focus on industry structure. While these frameworks remain foundational, they are increasingly insufficient to explain competitive dynamics in environments where resources are fluid, boundaries are porous, and competitive positions evolve rapidly [1]. In particular, the RBV's focus on resource ownership is strained by the rise of shared, user-generated,

and externally sourced data [3]. At the same time, structural models struggle to account for platforms that actively reshape industry boundaries [5]. Instead, advantage increasingly accrues to firms that harness data as a strategic asset [6], leverage digital platforms for coordination [11], and exploit algorithmic capabilities for dynamic decision-making [12]. This implies a shift from static advantage to continuously enacted advantage [8], where firms must repeatedly reconfigure their capabilities in response to evolving data environments [10].

Digitalization has accelerated this shift by enabling the creation of platform ecosystems where multiple actors interact [2], generating network effects that amplify value creation and capture [3, 13]. Platforms across e-commerce, mobility, and social media demonstrate how intermediaries can orchestrate ecosystems [1], turning user interactions into data-driven insights that reinforce their dominance [4]. These ecosystems function as distributed value-creation systems in which users, complementors, and third-party developers collectively contribute to innovation and service delivery [2]. The platform firm's role is not only to participate but to design and govern the architecture of interactions [3], setting standards, rules, and incentives that shape ecosystem behavior [5]. As participation grows, network effects strengthen [7], leading to self-reinforcing cycles of adoption, data generation, and service improvement that are difficult for competitors to replicate [9].

Concurrently, big data analytics and artificial intelligence have transformed strategy from static planning to continuous, adaptive processes [8, 14–19]. Firms now engage in algorithmic competition [5], in which pricing, personalization, and resource allocation adjust instantaneously in response to data inputs [17]. Decision-making is increasingly delegated to algorithmic systems capable of processing high-velocity, high-volume data streams [6], enabling firms to experiment, learn, and adapt at unprecedented speed [8]. This transition alters not only the tempo of competition but also its underlying logic [10]: strategies are no longer fully formulated *ex ante* [12] but emerge through iterative cycles of testing, feedback, and refinement [14]. As a result, firms that excel in integrating analytics into operational processes gain a temporal advantage [16], outpacing rivals in sensing and responding to market changes [19].

These changes introduce new logics of advantage. Speed emerges as firms use real-time analytics to respond faster than rivals [12, 17]. Scale benefits from network effects that

create winner-take-most dynamics [3, 13, 20]. Learning becomes central as machine learning algorithms improve through data feedback loops [6, 8, 21–25]. Connectivity arises from strategic positioning within ecosystems [4], where firms gain advantage by linking complementary actors [11, 22]. Importantly, these logics are not independent [1]; they are deeply interrelated and mutually reinforcing [3]. For example, increased scale generates more data, which enhances learning [5]; improved learning accelerates decision-making, increasing speed [7]; and faster, more effective decisions strengthen ecosystem participation and deepen connectivity [9]. This recursive interaction suggests that competitive advantage in digital environments is systemic and path-dependent [12], emerging from the interplay of multiple dynamic capabilities rather than isolated strategic choices [14].

Despite these developments, existing research often treats these elements—data, platforms, analytics, and ecosystems—in isolation [7], resulting in fragmented theoretical explanations [14, 23]. There remains limited integration of how these components jointly reshape the foundations of competitive advantage [1]. In particular, the mechanisms by which data-driven processes translate into sustained advantage [3] and how platform-mediated interactions reinforce these processes over time [5] remain only partially theorized [8]. Addressing this gap requires moving beyond single-theory explanations toward a more holistic understanding of digital competition [10] that captures both technological and organizational dimensions [12].

This article addresses these gaps through a conceptual, theory-development approach. It synthesizes literature from 2017 to 2024 to propose new mechanisms of competitive advantage in data-rich markets. The focus lies on the transition from traditional to digital and data-driven strategies, the role of data, analytics, and platforms, and the emergence of novel competitive logics. By developing propositions grounded in existing research, the article offers a framework for understanding strategic transformation in the digital economy. In doing so, it contributes to the ongoing evolution of strategic management theory by articulating how advantage is created, sustained, and transformed under conditions of data abundance and technological dynamism. The structure proceeds as follows: a synthesis of theoretical foundations, followed by the development of an integrated theory with propositions and a conceptual model.

Theoretical Foundations and Literature Synthesis

Strategic management scholarship has long centered on two dominant paradigms: the resource-based view and market positioning perspectives. The RBV posits that sustained advantage derives from unique, difficult-to-imitate resources [9], while positioning theories emphasize structural industry factors [20]. These frameworks, however, were developed in pre-digital contexts where information was costly, and asymmetries were persistent [5, 8].

The advent of digital technologies has disrupted these assumptions. Digital platforms serve as meta-organizations that facilitate interactions among diverse actors, generating network effects that create scale advantages and lock-in dynamics [2, 3, 13]. Platform ecosystems differ from traditional value chains by enabling multi-sided markets where value emerges from connectivity rather than linear production [1, 4, 21]. Incumbent firms increasingly adapt by transitioning from product-centric to ecosystem-centric models, incorporating digital services and data orchestration [4, 11].

Data itself has emerged as a core strategic resource. Unlike traditional assets, data exhibits non-rivalry, scalability, and generative properties—its value increases with volume and use [5, 8, 10]. Big data analytics capabilities enable firms to extract insights, predict behaviors, and personalize offerings, thereby enhancing competitive performance [6, 9, 16]. Research highlights how data-driven innovation capabilities interact with marketing agility to sustain advantage amid turbulence [7, 17]. Moreover, data governance and quality become critical for realizing value from analytics [6, 8].

Platform competition introduces additional complexities. Entrants challenge incumbents by leveraging digital infrastructure to build ecosystems with superior network effects [1-3]. Selective promotion of complements and orchestration of ecosystem value enhances platform dominance [13]. At the same time, algorithmic competition allows firms to engage in real-time strategic adjustment, such as dynamic pricing and recommendation systems, which traditional strategies could not achieve [5, 12, 17].

Ecosystem-based positioning further redefines strategy. Firms gain an advantage not solely through internal resources but also through their positioning within

interconnected networks, fostering connectivity and co-creation [11, 22, 23]. Digital transformation literature underscores how capabilities such as platform digitization and leadership support innovation and agility [12, 15].

Despite these advances, fragmentation persists. Studies often examine isolated elements—data analytics [6, 8, 16], platform dynamics [1, 3, 13], or ecosystem adaptation [4, 11]—without integrating them into a cohesive theory of strategic transformation. Few frameworks explicitly address the shift from traditional to data-driven logics, particularly the interplay of speed, scale, learning, and connectivity as emergent advantages [7, 14, 19]. This synthesis reveals the need for a unified conceptual model that explains how data-rich environments reconfigure competitive strategy.

Table 1 clarifies how the foundations of competitive advantage shift from static resource possession and market positioning toward recursive, data-driven, and ecosystem-mediated logics.

Table 1. Comparative reconfiguration of competitive strategy: from traditional logics to data-driven logics of advantage

Strategic dimension	Traditional competitive logic	Transitional digital logic	Data-driven competitive logic
Primary source of advantage	Scarce resources and defended positions	Digitally enabled coordination and service augmentation	Continuous data generation, analytics, and adaptive orchestration
Nature of key resource	Owned, bounded, and relatively stable assets	Hybrid asset base combining internal resources with digital interfaces	Generative, non-rival, continuously expanding data resources
Strategic tempo	Periodic planning and episodic adjustment	Faster response supported by digital infrastructure	Continuous real-time sensing, experimentation and optimization

Basis of scale	Production scale and market share	Multi-sided participation and digital reach	Network effect data compounding and ecosystem expansion
Learning mechanism	Managerial interpretation and delayed feedback	Digitally assisted monitoring and partial feedback integration	Closed-loop machine learning, interaction feedback, and recursive refinement
Locus of value creation	Firm-centered production and delivery	Firm-platform hybrid coordination	Distributed ecosystem interaction and platform-mediated co-creation
Competitive boundary	Industry-defined and relatively stable	Cross-boundary digital spillovers	Porous, shifting and ecosystem based competitive space
Role of technology	Support function	Enabler of coordination and service extension	Core strategic architecture shaping decision-making and adaptation
Source of defensibility	Imitation barriers and structural position	Switching costs, digital integration, and installed base	Data advantages, algorithmic tuning, platform governance, and feedback depth
Dominant risk	Resource erosion or positional pressure	Incomplete digital transition	Ecosystem fragility, governance failure, and loss of adaptive speed

Reconfiguring Competitive Advantage: Data-Driven Logics and Strategic Transformation in Digital Ecosystems

Data-driven competitive advantage

In data-rich markets, competitive advantage shifts from static resource possession to dynamic data generation and utilization. Data serves as a generative resource, enabling continuous value creation through analytics [5, 8, 10]. Firms with superior data accumulation and processing capabilities achieve differentiation and cost efficiencies unattainable in traditional settings [6, 7, 16]. This transition weakens traditional RBV barriers, as data becomes more abundant and accessible, yet the advantage accrues to those who master its strategic deployment [9, 17].

Platform-mediated competition and network effects

Platforms introduce network effects that amplify scale advantages, creating winner-take-most markets [2, 3, 13]. As user participation increases, the marginal value of additional users grows nonlinearly, reinforcing positive feedback loops that entrench dominant actors. This dynamic shifts competition away from price and product differentiation toward the ability to rapidly scale user bases and attract complementary participants. Incumbents and entrants compete by orchestrating ecosystems that lock in users and complements, generating exponential value growth [1, 4, 21]. Importantly, switching costs, data accumulation, and interoperability constraints further stabilize these advantages, making competitive displacement increasingly difficult once a platform reaches critical mass. Platform strategies thus emphasize ecosystem coordination over internal optimization, transforming competition into battles for connectivity and participation [11, 20, 22]. In this context, competitive advantage is less about firm-specific resources in isolation and more about the capacity to mobilize and govern distributed networks of actors.

Algorithmic strategy and real-time adaptation

Algorithmic competition enables real-time strategic adjustment, replacing periodic planning with continuous

optimization [5, 12, 17]. Rather than relying on discrete strategic cycles, firms deploy machine learning systems that iteratively refine decisions using streaming data. Firms leverage machine learning to respond instantaneously to market signals, enhancing speed and responsiveness [16, 19]. This continuous adaptation allows firms to dynamically adjust pricing, recommendation systems, supply allocation, and user engagement strategies at granular levels. The logic of speed undermines traditional strategic inertia, favoring those with advanced analytics infrastructure and data integration capabilities [8, 25-29]. Over time, this creates a divergence between firms capable of real-time experimentation and those constrained by slower decision-making processes. Consequently, competitive advantage increasingly depends on the ability to operationalize data into rapid, automated decision loops rather than solely on superior strategic foresight.

Ecosystem-based strategic positioning

Strategic positioning now occurs within ecosystems, where advantage derives from connectivity and co-evolution with partners [4, 11, 23]. Firms position themselves as orchestrators or complementors, gaining from shared data flows and innovation ecosystems [13, 22]. Orchestrators capture value by setting rules, standards, and interfaces that govern interactions, while complementors derive value by specializing within the ecosystem's architecture. This division of roles introduces interdependence, where firm performance is contingent on the health and evolution of the broader ecosystem. This connectivity logic extends beyond firm boundaries, creating relational advantages that are difficult to replicate through internal capabilities alone [21]. As a result, strategic positioning becomes a matter of managing inter-organizational dependencies, aligning incentives, and facilitating co-innovation rather than defending isolated market positions.

Emerging logics of advantage

The synthesis above points to four interconnected logics: speed (real-time adaptation), scale (network amplification), learning (feedback-driven improvement), and connectivity (ecosystem integration). These logics are mutually reinforcing rather than independent. For instance, greater scale generates more data, which enhances learning; improved learning strengthens algorithmic decision-making, increasing speed; and faster, more effective decisions reinforce ecosystem attractiveness and deepen connectivity. These logics interact through recursive

feedback loops, in which data generation fuels analytics that inform platform decisions, reinforcing ecosystem positioning [6, 8, 12, 17].

Table 2 specifies how speed, scale, learning, and connectivity operate as mutually reinforcing logics of advantage rather than as isolated digital capabilities.

Table 2. Architecture of emerging competitive logics: mechanisms, reinforcement pathways, and strategic vulnerabilities

Emerging logic	Core strategic mechanism	Immediate advantage produced	Reinforcement pathways and other impacts
Speed	Real-time data processing and algorithmic decision adjustment	Faster sensing, response, and execution	Speed in user experience and strategic responsiveness, which strengthens connectivity and can accumulate scale advantages
Scale	Network effects and cumulative participation growth	Winner-take-most expansion and lower marginal growth costs	Scale generates more data, which improves learning and further enhances speed, platform attractiveness
Learning	Feedback-driven model improvement and cumulative intelligence	Better prediction, personalization, and adaptation quality	Learning sharpens decision-making, increases speed, raises performance, which deepens connectivity and connectivity
Connectivity	Strategic positioning within ecosystem	Access to complements, co-innovation, and shared resources	Connectivity broadens ecosystem reach and interaction

	ecosystems and coordinated interdependence	and relational advantage	variety a heterog strengtl learnin amplifyir
System-level interaction	Recursive coupling among all four logics	Self-reinforcing and path-dependent digital advantage	Scale learn learn accele speed, impro ecosy attractiv and con expand gener

Over time, such feedback loops produce path-dependent advantages that are self-reinforcing and resistant to imitation. This perspective suggests that competitive advantage in digital environments is increasingly systemic, emerging from the interaction of multiple capabilities rather than from any single resource or competency.

Theoretical Implications

Taken together, these dynamics challenge traditional assumptions of equilibrium-based competition and stable industry boundaries. Instead, competition becomes evolutionary, characterized by continuous reconfiguration and nonlinear growth trajectories. Firms do not merely compete within markets but actively shape their structure and dynamics through platform design, data governance, and algorithmic control. This implies that advantage is not only accumulated but continuously enacted through ongoing interactions between firms, users, and technologies. Moreover, the convergence of platformization and algorithmic capabilities suggests that future competitive landscapes will be increasingly defined by the integration of technological infrastructure with strategic intent.

Propositions

Proposition 1

In data-rich markets, firms with superior data accumulation and analytics capabilities achieve sustained competitive advantage by transforming data into generative strategic

resources, beyond traditional resource-based constraints [5, 6, 8, 10].

Proposition 2

Platform-mediated competition intensifies scale advantages through network effects, enabling winner-take-most dynamics that favor ecosystem orchestrators over traditional competitors [2, 3, 13, 20].

Proposition 3

Algorithmic competition enhances speed as a competitive logic, enabling firms to make real-time strategic adjustments and outperform rivals reliant on periodic planning [5, 12, 17, 25].

Proposition 4

Ecosystem-based positioning fosters connectivity advantages, enabling firms to achieve superior performance through strategic integration and co-creation within digital networks [4, 11, 22, 23].

Proposition 5

The interplay of data-driven resources, platform orchestration, and algorithmic adaptation creates feedback loops that sustain learning advantages, enabling continuous strategic reconfiguration in volatile markets [6, 8, 16, 19]. **Figure 1** illustrates the evolutionary architecture through which competitive strategy shifts from traditional resource- and position-based logic toward a recursive data-driven system in which speed, scale, learning, and connectivity interact to generate sustained advantage in digital ecosystems.

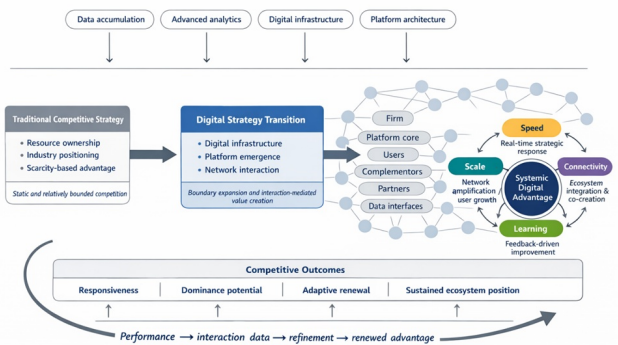


Figure 1. Competitive strategy transformation in data-rich markets: an evolutionary architecture of data, platforms, algorithms, and ecosystem feedback

Orchestrating Value in Interconnected Markets: Feedback Dynamics and Sustained Advantage

Feedback loops and continuous learning mechanisms

The propositions developed earlier reveal that competitive advantage in data-rich markets is not a static endpoint but a self-reinforcing cycle. Data accumulation fuels analytics capabilities [6], which, in turn, power algorithmic adjustments that generate new data streams [8], closing the loop [16, 19]. This learning logic distinguishes data-driven strategies from traditional models [5], in which knowledge accumulation was episodic rather than continuous [12]. Firms that embed machine-learning routines within platform architectures convert every customer interaction into strategic fuel [17], accelerating capability development far beyond what isolated analytics or static resources could achieve [25]. The result is a virtuous cycle: superior learning compounds scale advantages [2], as platforms with richer data histories attract more participants [3], further intensifying network effects [13, 20].

Empirical patterns documented across recent studies confirm that organizations mastering these loops outperform rivals by orders of magnitude in responsiveness and innovation velocity [7, 10, 23]. Yet the mechanism is subtle: advantage arises not merely from possessing data [6] but from governing its flow and converting it into adaptive intelligence at scale [8]. Proposition 6, therefore, extends the framework: Firms that institutionalize closed-loop data analytics-algorithm systems cultivate superior learning advantages [6], enabling sustained outperformance even when traditional resource barriers erode [8, 16, 19, 25].

Adaptive pathways in algorithmic environments

Algorithmic competition introduces temporal compression to strategy formulation. What once required quarterly

reviews now unfolds in milliseconds [5], with dynamic pricing, personalized recommendations, and resource reallocation occurring continuously [12, 17]. This speed logic interacts powerfully with connectivity: algorithms operating across ecosystem boundaries can optimize not only internal operations but also partner contributions in real time [4, 11, 22, 23]. For instance, platform orchestrators adjust complement visibility and data-sharing protocols instantaneously in response to performance signals [13], creating adaptive pathways that traditional supply-chain logic could never replicate [20].

The theoretical implication is profound. Strategic decision-making shifts from discrete choice sets to continuous optimization surfaces [12], where the firm's role becomes one of boundary-spanning algorithm design rather than isolated planning [17, 25]. Proposition 7 captures this shift: Algorithmic integration across platform ecosystems converts speed into a durable competitive logic [5] by enabling real-time co-adaptation among interdependent actors [12], thereby raising the cost of imitation for slower-moving rivals [17, 23, 25].

Connectivity and co-evolution in ecosystems

Beyond scale and speed lies connectivity as the relational glue of data-driven advantage. Firms no longer compete as standalone entities but as nodes within living ecosystems where value co-evolves through shared data infrastructures [1, 4, 11, 21, 22]. Positioning decisions now center on the deliberate cultivation of complementor relationships [13] and the selective opening or closing of data interfaces [23]. Successful orchestrators deliberately amplify network effects by curating participant diversity [2] while maintaining governance that protects core data advantages [3, 20].

This connectivity logic interacts with learning: richer ecosystem ties generate more heterogeneous data [6], which in turn sharpens algorithmic precision and accelerates capability development [8, 16]. Proposition 8 synthesizes the four logics: The joint operation of speed, scale, learning, and connectivity produces an emergent competitive advantage that is simultaneously more potent and more fragile than traditional forms [1], because it depends on continuous ecosystem orchestration rather than isolated firm resources [3, 4, 11, 13, 22].

Unveiling Strategic Ramifications: Tensions, Trade-offs, and Transformative Pathways in Digital Competition

Balancing data abundance with governance constraints

While data-driven logics deliver unprecedented advantage, they simultaneously surface new tensions. The very mechanisms that generate learning loops—continuous data capture and algorithmic optimization—raise governance challenges around privacy, ownership, and regulatory compliance [5, 8, 10]. Firms must navigate the trade-off between maximizing data scale to achieve competitive speed [6] and preserving ecosystem trust to sustain participation [23]. The framework suggests that superior governance itself becomes a new source of advantage [11]: those who embed transparent data protocols and ethical algorithmic design into platform architecture convert potential liabilities into relational strengths [22].

Navigating winner-take-most dynamics and competitive fragility

Network effects produce powerful scale advantages yet also create fragility. Once a platform achieves dominance, marginal improvements in learning or connectivity can trigger rapid shifts in ecosystem allegiance [2, 3, 13, 20]. The theory predicts that sustained advantage requires perpetual investment in adaptive pathways [12]—firms cannot rest on their current network size [17]. Still, they must continuously refresh their algorithmic capabilities and connectivity architectures [25]. This ongoing arms race elevates the strategic importance of ecosystem leadership over traditional market-share battles [4].

Pathways for incumbent transformation and new entrant strategies

Incumbents face a dual imperative: retrofit legacy resource configurations with data and platform layers [4] while simultaneously reorienting culture toward continuous learning [11, 21]. The conceptual model illustrates that successful transformation follows a staged progression—digital infrastructure first, then platform orchestration, finally full data-driven algorithmic integration [1]—each stage

unlocking the next logic of advantage [7, 16]. New entrants, conversely, can leapfrog by designing native data-genetic platforms that embed all four logics from inception [2], bypassing the inertia that hampers established players [3, 13].

Managerial levers for activating the new logics

Practitioners can operationalize the framework through three concrete levers: (1) architecting closed-loop data systems that feed directly into algorithmic engines [6], (2) designing selective openness in ecosystem interfaces to optimize connectivity without ceding control [8], and (3) institutionalizing real-time experimentation cultures that treat every market signal as learning input [12, 17]. These levers are mutually reinforcing [5]; activating one strengthens the others [19], creating compounding returns on strategic investment [25].

Conclusion

The transformation of competitive strategy in data-rich markets: emerging logics of advantage in the digital economy has delineated a fundamental shift in the foundations of advantage. Traditional resource-based and positioning paradigms, while still relevant as historical anchors, are subsumed by a new theoretical architecture centered on data generativity, platform orchestration, algorithmic dynamism, and ecosystem connectivity. The eight propositions and the accompanying conceptual model articulate how speed, scale, learning, and connectivity interact through self-reinforcing feedback loops to produce sustained advantage in volatile digital environments.

This integrated theory advances strategic management scholarship by moving beyond fragmented studies of isolated digital phenomena toward a holistic explanation of competitive reconfiguration. It explains why some firms achieve seemingly unassailable positions while others, despite substantial traditional resources, falter: advantage now resides in the capacity to orchestrate continuous data-to-action cycles within living ecosystems rather than in the possession of static assets.

For practice, the framework offers clear guidance: competitive success in the digital economy demands deliberate investment in data infrastructure, algorithmic agility, and ecosystem governance simultaneously.

Managers who treat strategy as perpetual adaptation—rather than periodic planning—will be best positioned to capture the emerging logics of advantage. Future research can extend the model by examining boundary conditions such as regulatory intensity, industry maturity, or cultural contexts, yet the core proposition remains robust: in data-rich markets, competitive advantage is no longer owned; it is continuously co-created through speed, scale, learning, and connectivity.

The digital economy has not merely added new tools to the strategist's kit—it has rewritten the rules of the game. Firms that internalize these transformed logics will thrive; those that cling to pre-digital mental models will find themselves increasingly marginalized in an era defined by data abundance and platform-mediated competition.

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