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Digital Strategy Beyond Technology Adoption: Organizational Transformation in Firms Operating Within Data-Centric Economies

Jose Martinez^{1*}, Carmen Lopez¹

Abstract

Digital strategy has evolved from a narrow focus on technology adoption into a profound organizational transformation imperative for firms competing in data-centric economies. Despite substantial investments in digital tools, many organizations fail to achieve sustained competitive advantage because they treat digital initiatives as IT implementation projects rather than as catalysts for redesigning structures, routines, decision systems, and capabilities. This conceptual article argues that in environments where data serves as the primary coordination mechanism, strategic success depends on shifting from superficial digitization to deep organizational reconfiguration. Synthesizing insights from strategic management, organization theory, and digital transformation scholarship, the analysis first identifies the strategic limitations of technology-centric views, emphasizing organizational inertia, legacy tensions, and misalignments between traditional governance and data-driven logics. It then introduces an integrative framework—the Organizational Transformation Architecture—that comprises six interdependent elements: digital infrastructure, routine transformation, decision-system integration, capability reconfiguration, governance alignment, and continuous learning loops. This framework maps the progression from data integration to strategic outcomes while embedding feedback mechanisms that sustain ongoing adaptation. The article offers executives a practical roadmap for moving beyond adoption to achieve substantive transformation, demonstrating that competitive differentiation in data-centric economies arises not from technology per se but from the organizational redesign that surrounds it. Managerial implications center on leadership practices that align legacy structures with emerging digital logics, enabling firms to realize the full strategic potential of data as a core asset.

Keywords Digital capabilities, Organizational transformation, Digital strategy, Data-centric economies, Strategic reconfiguration, Managerial challenges, Data-driven coordination

*Correspondence:

Jose Martinez

jose.martinez@gmail.com

¹ Department of Digital Strategy and Business Innovation, University of Salamanca, Salamanca, Spain

Introduction

The contemporary business landscape is defined by data-centric economies in which value creation increasingly hinges on the continuous generation, orchestration, and exploitation of data flows [1] rather than on physical assets or traditional market positions [2]. Firms that once competed through superior products or efficient operations now face a new imperative: digital strategy must be

reconceived as organizational transformation [3], not simply as the procurement and deployment of technological solutions [4]. This shift reflects an ontological reversal in which data objects and digital platforms become the central organizing principles of the firm [3], displacing earlier assumptions about hierarchical control and functional specialization [5].

Yet the gap between rhetoric and reality remains wide. Despite substantial investments in cloud computing, artificial intelligence, and analytics platforms [6], many organizations experience disappointing returns because they frame digital strategy narrowly as technology adoption [7]. Such an approach treats digital tools as modular add-ons to existing operations [8], overlooking the deeper requirements of redesigning organizational structures, routines, decision processes, and capabilities to align with data-intensive logics [9]. Recent scholarship underscores that digital transformation succeeds only when firms move beyond implementation to orchestrate systemic change across the entire value architecture [10–12].

This managerial and strategic perspective article addresses this critical shortfall. It argues that in data-centric economies, competitive advantage accrues to organizations that treat digital strategy as a holistic transformation process encompassing structural redesign, routine reconfiguration, and governance evolution [13–15]. The analysis proceeds in three stages. First, it examines the strategic challenge of moving beyond technology adoption [11], identifying why many firms remain trapped in superficial digitization and how organizational inertia undermines genuine transformation [16, 17]. Second, it presents a managerial framework—the Organizational Transformation Architecture—designed to guide executives through the progression from data integration to capability reconfiguration and sustained strategic outcomes [5, 8, 18].

The contribution is twofold. Theoretically, the article synthesizes fragmented insights on digital strategy into a coherent managerial lens that foregrounds organizational transformation over technology deployment [2, 9, 19]. Practically, it equips senior leaders with actionable principles for redesigning their firms to thrive amid data-centric competition [20], where coordination, learning, and adaptation occur at unprecedented speed [21, 22]. By focusing on the interplay between legacy arrangements and emerging digital logics [23], the article highlights the managerial requirements for deep transformation. It offers a roadmap for avoiding the common pitfalls of symbolic digitalization [24, 25]. In doing so, it responds directly to calls for research that bridges digital strategy with the realities of organizational change in data-driven environments.

Strategic Challenge of Moving Beyond Technology Adoption

Executives frequently equate digital strategy with the selection and rollout of new technologies—such as cloud migration, enterprise resource planning upgrades, or artificial intelligence pilots—yet this perspective fundamentally misrepresents the nature of value creation in data-centric economies [6, 7, 12]. Technology adoption, while necessary, constitutes only the entry point; without accompanying organizational transformation, such investments yield marginal gains and often reinforce existing inefficiencies [8, 9]. The core strategic challenge lies in recognizing that data-centric competition demands a fundamental redesign of how the firm coordinates activities, makes decisions, and creates value [5, 18].

A primary reason firms falter is the persistent conflation of digitization with transformation. Digitization involves converting analog processes into digital formats, whereas digital transformation requires reconfiguring the organizational architecture around data as the central coordinating mechanism [2, 9, 17]. Empirical patterns documented across multiple studies reveal that organizations often pursue isolated technology projects that leave legacy structures, routines, and governance models intact [4, 16, 26]. For instance, implementing advanced analytics platforms without altering decision rights or cross-functional workflows results in data silos rather than enterprise-wide intelligence [1, 13]. This superficial approach stems from a managerial mindset that views digital tools as substitutes for organizational effort rather than catalysts for deeper change [20, 21].

Organizational inertia compounds the problem. Established firms carry entrenched routines, hierarchical reporting lines, and incentive systems optimized for pre-digital conditions [11, 19, 25]. These legacy arrangements create powerful counterforces against the fluid, data-driven coordination required in contemporary markets. Research on incumbent organizations demonstrates that structural rigidities—such as functional silos and risk-averse cultures—systematically impede the diffusion of digital logics across the enterprise [10, 14, 22]. Moreover, the very success of legacy business models generates cognitive and political barriers; managers accustomed to predictable, hierarchical decision-making struggle to embrace the decentralized, real-time adaptation demanded by data-centric operations [5, 17].

Table 1 distinguishes technology-adoption logic from organizational-transformation logic, clarifying why competitive advantage in data-centric economies depends on redesigning the firm rather than merely implementing digital tools.

Table 1. From technology adoption to organizational transformation: a strategic contrast framework

Analytical dimension	Technology-adoption logic	Organizational-transformation logic	Strategic implications
Primary objective	Implement new digital tools	Reconfigure the firm around data-centric coordination	Advantage depends on redesigned processes
View of technology	Operational enabler or add-on	Embedded component of a wider transformation architecture	Technology alone generates sustainable differences
Role of data	Reporting input or byproduct	Core coordinating mechanism of organizational activity	Data becomes a strategic organizational asset
Organizational structure	Legacy hierarchy remains intact	Cross-functional, modular, agile, and networked arrangements emerge	Structural flexibility becomes a competitive advantage
Routines and workflows	Existing routines are digitized	Routines are redesigned for real-time adaptation	Processes determine whether tools are valuable
Decision-making model	Sequential, top-down, retrospective	Integrated, analytics-embedded, real-time, and distributed	Development of quality improvements
Capability development	Training tied to tool usage	Dynamic capabilities are reconfigured around sensing, seizing, and transforming	Firm cumulative strategic adaptation

		seizing, and transforming	
Governance orientation	Compliance-centered and functionally fragmented	Adaptive stewardship balancing control, experimentation, and accountability	Governance becomes enabler of transformation rather than a barrier
Leadership role	Sponsor of technology projects	Architect of firm-wide redesign and alignment	Executive commitment determines transformation depth
Performance measurement	Adoption rates, implementation milestones, and system usage	Reconfiguration depth, data-flow velocity, capability renewal, and strategic outcomes	New areas need dedicated subsystems and processes
Learning logic	Episodic review after implementation	Continuous feedback and iterative adaptation	Transformation becomes ongoing rather than a one-time event
Competitive consequence	Limited efficiency gains; symbolic digitalization risk	Sustained resilience, agility, innovation, and value creation	Achieving organizational change requires true strategic advantage

Tensions between legacy processes and data-centric operations manifest at multiple levels. At the operational level, traditional routines built around periodic reporting clash with continuous data streams that enable predictive and prescriptive analytics [1, 3]. Decision systems designed for top-down control prove inadequate when insights emerge from network effects and ecosystem interactions [8, 18]. Governance mechanisms that emphasize compliance and functional accountability often conflict with the agile, experiment-driven ethos of digital-native organizations [23, 27]. These tensions are not merely technical but strategic: they determine whether data becomes a source of competitive differentiation or merely an operational byproduct [13, 15].

Capability change emerges as more critical than tool implementation. Digital capabilities—encompassing data sensing, insight generation, and rapid reconfiguration—cannot be purchased off the shelf; they must be cultivated through deliberate organizational redesign [25, 27, 28]. Studies emphasize that firms achieving superior performance invest in developing dynamic capabilities that integrate digital technologies with human judgment and organizational learning [2, 14]. Mere adoption of platforms fails to deliver advantage unless accompanied by capability reconfiguration that aligns talent, processes, and strategy [12, 24].

The managerial challenge is therefore twofold: first, to diagnose the depth of required transformation and, second, to orchestrate change across structures, routines, and decision systems simultaneously [10, 22]. Leaders who treat digital strategy as a technology project inevitably encounter symbolic digitalization—visible investments that mask unchanged underlying logics [16, 17]. In contrast, those who embrace organizational transformation recognize that data-centric economies reward firms capable of continuous strategic adaptation through redesigned coordination mechanisms [5, 18, 26]. Overcoming these challenges demands a systemic perspective that integrates infrastructure, governance, and learning—precisely the focus of the framework developed in the following section.

Transforming the Firm for Data-Centric Competition

Successful navigation of data-centric economies requires executives to adopt a holistic architecture that positions digital strategy as organizational transformation rather than incremental technology deployment. The proposed framework—organizational transformation architecture for digital strategy in data-centric economies—provides managers with a structured yet flexible model for orchestrating this shift. It comprises six interdependent components: (1) digital infrastructure and data foundation, (2) organizational redesign and routine transformation, (3) decision-system integration, (4) capability reconfiguration and cross-functional coordination, (5) governance and leadership alignment, and (6) continuous learning and transformation feedback loops [5, 8, 12, 13, 18, 27].

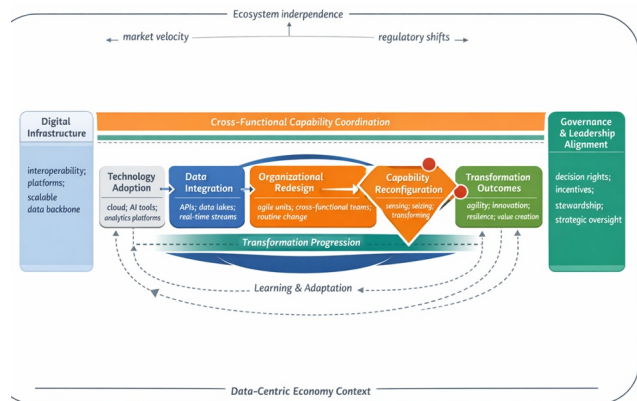


Figure 1. Organizational transformation architecture for digital strategy in data-centric economies

This architecture moves firms from adoption to transformation by ensuring that each layer builds upon and reinforces the others. Digital infrastructure provides the technical bedrock, yet its value materializes only when embedded within redesigned routines and decision systems [1, 3]. Organizational redesign dissolves legacy silos, enabling the cross-functional coordination essential for capability reconfiguration [10, 14, 15]. Governance alignment ensures that leadership incentives and accountability structures support rather than resist data-centric logics [22, 23]. Continuous learning loops institutionalize adaptation, turning transformation into an ongoing strategic capability rather than a one-time project [11, 12, 28].

Managers implement this framework by conducting a maturity assessment across the six components, identifying misalignments, and prioritizing interventions at leadership leverage points. Firms that apply the architecture avoid the common trap of isolated technology projects and instead achieve systemic redesign that aligns structures, routines, and strategy with the demands of data-centric competition [2, 13, 17, 26]. The result is not merely operational efficiency but strategic resilience and sustained value creation in environments where data coordination defines competitive boundaries.

Data-centric redesign of structures and routines

The organizational transformation architecture places organizational redesign at its core because data-centric economies render traditional hierarchies obsolete [10, 14, 15]. Structures must shift from functional silos to modular,

ecosystem-oriented networks where data flows freely across boundaries, enabling real-time collaboration rather than sequential handoffs. This redesign dissolves legacy reporting lines that slow decision velocity and replaces them with agile pods and platform teams that treat data as a shared enterprise resource [5, 18, 26].

Routines undergo parallel metamorphosis. Periodic, rule-based processes evolve into adaptive, algorithmically augmented workflows that respond instantaneously to market signals and internal performance data [1, 3, 13]. For instance, budgeting routines once anchored in annual forecasts become continuous, scenario-driven exercises powered by live data lakes. Such changes are not merely operational upgrades; they represent strategic reconfiguration that aligns internal operations with the velocity of external data ecosystems [11, 17, 19]. Managers must actively dismantle inertial routines—those optimized for stability rather than experimentation—while preserving core value-creating elements. Failure to do so results in hybrid organizations where digital tools coexist with analog mindsets, producing friction rather than synergy [16, 25].

The redesign process demands deliberate managerial orchestration. Leaders begin by mapping existing structures against data-flow requirements, identifying choke points where legacy arrangements impede coordination. Cross-functional governance bodies then pilot new routines in high-impact areas, scaling only after measurable alignment with data-centric performance indicators [2, 9, 22]. This phased yet systemic approach prevents the common pitfall of fragmented change initiatives that leave the broader organization untouched.

Decision-system integration and real-time adaptation

Decision systems increasingly constitute the organizational nervous system of the transformed firm, orchestrating how information is sensed, interpreted, and acted upon across multiple layers of activity. In data-centric environments, traditional decision logics—characterized by sequential approvals, hierarchical escalation, and retrospective reporting—are progressively displaced by integrated digital platforms that embed analytics directly into operational workflows [8, 12, 27]. These platforms do not merely support decision-making; they redefine where and how decisions occur.

Predictive and prescriptive analytics become codified within workflow triggers, enabling real-time recommendations at the precise moment of action. For example, algorithmic decision-support systems can autonomously adjust pricing, allocate resources, or flag risks without requiring managerial intermediation. In this sense, analytics evolve from advisory tools into embedded governance mechanisms, shaping behavior *ex ante* rather than evaluating it *ex post* [20, 23]. Decision authority is thus partially reconfigured from human actors to socio-technical systems, fundamentally altering organizational control structures.

This integration directly addresses a longstanding organizational tension: legacy systems are typically optimized for stability, standardization, and risk minimization, whereas digital environments demand speed, experimentation, and iterative adaptation [5, 18]. By embedding intelligence into workflows, firms reconcile these competing logics. Risk is managed not through rigid controls but through continuous monitoring, automated feedback, and adaptive thresholds. Consequently, decision latency is reduced while maintaining acceptable levels of governance and oversight.

However, achieving such integration is not purely a technical endeavor. It requires the simultaneous alignment of technological infrastructure and organizational culture. On the technical side, interoperability across data sources, platforms, and analytical models is essential to ensure that insights flow seamlessly across the enterprise. On the cultural side, managers must fundamentally rethink authority structures. Decision rights shift toward data-literate teams that operate with bounded autonomy, supported by enterprise-wide guardrails that preserve strategic coherence and compliance [13, 22].

Training programs play a critical role in this transition, equipping employees with the analytical literacy required to interpret and act on data-driven insights. Equally important is the realignment of incentives: performance evaluation systems must reward evidence-based decision-making and penalize reliance on intuition when data is available. Over time, these changes cultivate an organizational mindset in which data is not merely consulted but trusted as a primary decision input.

When effectively implemented, decision-system integration yields profound performance benefits. Decision cycles that once spanned weeks or months can be compressed into

hours or even minutes. More importantly, the quality and consistency of decisions improve as variability driven by subjective judgment is reduced. Data thus transitions from a passive reporting artifact to an active competitive multiplier, enhancing both operational efficiency and strategic responsiveness [1-3].

Capability reconfiguration and cross-functional coordination

While digital technologies provide the infrastructure for transformation, it is organizational capabilities that ultimately determine whether competitive advantage is realized and sustained. Accordingly, the architecture emphasizes the reconfiguration of dynamic capabilities—specifically sensing, seizing, and transforming—around data as the central operand of value creation [25, 27, 28].

Digital sensing capabilities are significantly enhanced through continuous environmental scanning enabled by integrated data ecosystems. Firms can monitor customer behavior, market dynamics, and operational performance in real time, allowing them to detect weak signals and emerging opportunities with greater precision and speed. Importantly, sensing is no longer episodic but has become a continuous, automated process embedded within digital infrastructures.

Seizing capabilities emerge when organizations translate these insights into concrete actions. This often occurs through cross-functional teams that rapidly design and execute pilot initiatives. Such teams combine technical expertise (e.g., data science, engineering) with domain knowledge (e.g., marketing, operations), enabling them to move from insight to implementation without the delays associated with functional silos [12, 14, 15]. The emphasis shifts from large-scale, high-risk investments to iterative experimentation, where small-scale pilots generate learning that informs subsequent scaling decisions.

Transforming capabilities complete the cycle by institutionalizing learning. Insights derived from pilot outcomes are fed back into both technological infrastructure and organizational routines. This may involve updating data models, refining processes, or reallocating resources. Over time, the organization develops a self-reinforcing system in which each cycle of sensing, seizing, and transforming enhances the next, creating a cumulative capability advantage.

Cross-functional coordination is the critical mechanism that binds these capabilities into a coherent system. In traditional organizations, expertise is compartmentalized within functional silos, leading to fragmentation and inefficiency. In contrast, data-centric firms organize around data domains and problem spaces rather than rigid departmental boundaries [10, 11, 18]. Talent is deployed dynamically, forming fluid teams that assemble and disband in response to evolving priorities.

This shift places significant demands on leadership. As highlighted in **Figure 1**, key intervention points occur at the intersection of capabilities and coordination. Executives must actively sponsor capability-building initiatives such as digital academies, which develop shared skill sets and common languages across the organization. Talent rotation programs further enhance integration by exposing employees to multiple domains, fostering a holistic understanding of the firm's data ecosystem.

Moreover, performance metrics must be redefined to reflect ecosystem-level outcomes rather than narrow functional targets. For example, success may be measured in terms of end-to-end process improvements, customer value creation, or innovation velocity, rather than isolated departmental outputs [21, 22]. Without such reconfiguration, technological investments risk remaining fragmented, and organizational capabilities remain anchored in pre-digital logics that inhibit transformation.

Governance, leadership alignment, and continuous learning loops

As organizations become increasingly data-driven, governance structures must evolve accordingly. Traditional governance models, which emphasize compliance, control, and risk avoidance, are insufficient in environments characterized by rapid change and high uncertainty. Instead, governance must adopt an adaptive stewardship model that balances flexibility with accountability [23, 27].

This involves establishing new institutional mechanisms, such as data ethics councils, to oversee the responsible use of data and algorithms. Dynamic risk frameworks replace static policies, enabling organizations to adjust risk thresholds in response to changing conditions. Incentive systems are also recalibrated to discourage inertia and reward proactive adaptation, thereby aligning individual behavior with organizational transformation goals [20, 21].

Leadership alignment is a critical enabler of these changes. Digital transformation cannot be delegated to a single function or role; it requires collective ownership at the highest levels of the organization. Chief digital officers, chief information officers, and other C-suite executives must collaborate closely to ensure that strategic, technological, and operational priorities are aligned [6, 7, 24].

Equally important is the symbolic role of leadership. Executives must model data-centric behaviors by demonstrating a willingness to rely on analytics in their decision-making. Through consistent communication, they must articulate a compelling transformation narrative that frames digitalization not as an IT initiative but as a strategic imperative essential for long-term competitiveness.

Continuous learning loops serve as the integrative mechanism that sustains transformation over time. Data generated from organizational activities is continuously analyzed to produce real-time diagnostics, which in turn trigger adjustments across systems, processes, and capabilities [11, 12, 28]. These loops ensure that learning is not episodic but embedded within everyday operations.

Table 2 lists the managerial levers, organizational targets, transformation indicators, and failure risks for each component of the organizational transformation architecture.

Table 2. Managerial levers, organizational targets, and failure risks across the organizational transformation architecture

Architectural component	Primary managerial lever	Organizational target of change	Indicators of successful transformation
Digital infrastructure and data foundation	Invest in interoperable platforms, shared data architecture, and scalable integration	Enterprise-wide data accessibility and technical coherence	Unified data flows, functional integration, reduced fragmentation

Organizational redesign and routine transformation	Reconfigure structures, teams, workflows, and reporting lines	Shift from functional silos to agile, data-enabled coordination	Faster functional execution, reduced redundancy, improved resource allocation
Decision-system integration	Embed analytics into workflow triggers, dashboards, and operational decisions	Move from retrospective reporting to real-time evidence-based action	Reduced decision latency, higher consistency, improved operational responsiveness
Capability reconfiguration and cross-functional coordination	Build dynamic capabilities through pilots, talent rotation, and collaborative problem-solving	Strengthen sensing, seizing, and transforming across domains	Reduced conversion time, increased insight scalability, improved innovation pipeline
Governance and leadership alignment	Redesign decision rights, incentives, risk frameworks, and executive sponsorship	Align authority, accountability, and strategic intent with data-centric logics	Leadership data-behavioral governance that supports adaptive management
Continuous learning and feedback loops	Institutionalize feedback reviews, diagnostic loops, and iterative recalibration	Convert performance data into ongoing organizational renewal	Refined system routines, strategic prioritization
Cultural and behavioral reinforcement	Promote analytical literacy, experimentation norms, and evidence-based evaluation	Normalize trust in data while preserving managerial judgment	Wider adoption, collaborative adaptability, limited process rigidity
Strategic outcome realization	Link transformation initiatives to resilience, agility, and growth	Ensure redesign produces enterprise-level strategic gains	Observed improvements, adaptive innovation, increased velocity

	innovation, and value creation		ecosystem value
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Organizations that successfully implement such loops move beyond one-off transformation projects toward a state of perpetual strategic renewal. Adaptation becomes routinized, enabling firms to respond effectively to evolving market conditions and technological advancements. In this way, resilience is not achieved through stability but through the capacity for continuous change.

Beyond Symbolic Digitalization: The Managerial Roadmap for Substantive Transformation

A central risk in digital transformation is symbolic digitalization, where organizations adopt visible technologies without fundamentally altering underlying structures and processes. To avoid this, executives must anchor all initiatives within the broader architectural framework rather than pursuing isolated interventions [16, 17, 26].

The transformation journey begins with a comprehensive maturity assessment across the architecture's components, identifying gaps in infrastructure, capabilities, governance, and culture. Based on this assessment, managers prioritize interventions at key leverage points—particularly those related to leadership alignment and cross-functional coordination, as illustrated in [Figure 1](#).

Pilot initiatives play a crucial role in operationalizing the roadmap. Rather than attempting enterprise-wide transformation from the outset, organizations should experiment within selected units, testing the integration of all architectural components in a controlled environment. Successful pilots provide proof of concept and generate insights that inform broader rollout strategies.

Performance measurement must also evolve. Traditional KPIs focused on adoption rates or technology utilization are insufficient. Instead, organizations should track reconfiguration depth, capturing the extent to which underlying processes and capabilities have been transformed. Relevant metrics may include data-flow velocity, the adaptability of organizational routines, and measurable improvements in capability performance [2, 9, 13].

Cultural transformation is equally essential. Leadership storytelling helps shape shared understanding and commitment, while targeted upskilling initiatives build the competencies required for data-centric work. Recognition and reward systems reinforce desired behaviors, encouraging employees to embrace experimentation, collaboration, and evidence-based decision-making [22, 25].

Managers who follow this roadmap move beyond superficial digital investments toward a deeper transformation of organizational logics. In such firms, data becomes the primary currency of coordination, guiding interactions, decisions, and resource allocation. The resulting organizations compete not merely through technological assets but through structural agility, responsive routines, and continuously evolving capabilities—hallmarks of sustained competitive advantage in the digital era.

Conclusion

Digital strategy in data-centric economies is fundamentally an exercise in organizational transformation. Technology adoption supplies the infrastructure, yet competitive differentiation arises only when firms redesign structures, routines, decision systems, capabilities, and governance in concert. The Organizational Transformation Architecture presented here equips executives with a coherent managerial lens to navigate the tensions between legacy arrangements and emergent digital logics. By progressing deliberately through data integration, redesign, reconfiguration, and continuous learning, organizations escape the trap of symbolic digitalization and unlock substantive strategic advantage.

Leadership commitment remains the decisive factor. Executives who champion holistic transformation—rather than delegating digital initiatives to IT functions—position their firms to thrive amid data-centric competition. The framework underscores a central managerial truth: in environments where data coordinates value creation, the most powerful strategic asset is not the latest platform but the reconfigured organization that surrounds it. Firms that internalize this perspective will convert digital disruption into sustained renewal, while those clinging to technology-centric views risk obsolescence. The path forward is clear: treat digital strategy as organizational transformation and redesign the firm accordingly.

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