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The Digital Enterprise as an Adaptive System: Organizational Learning and Strategic Renewal in Data-Intensive Markets

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Abstract

In data-intensive markets shaped by exponential growth in digital signals, artificial intelligence, and real-time analytics, enterprises can no longer rely on static strategies. Instead, they must function as recursive adaptive systems that continuously sense, learn, and renew through data-driven mechanisms. This conceptual article synthesizes dynamic capabilities, organizational learning, and strategic renewal literatures to conceptualize the digital enterprise as an integrated adaptive architecture. It introduces the RADAR Framework—the Recursive Adaptive Digital Architecture for Renewal—a novel five-layer model centered on organizational learning that converts environmental data into sustained strategic reconfiguration. The framework explicates how sensing and data intake, interpretive learning, strategic prioritization, operational reconfiguration, and renewal outcomes interact through recursive feedback loops, enabling perpetual adaptation amid technological turbulence and market volatility. Organizational learning serves as the pivotal hub, transforming raw data into double-loop insights that fuel resource recombination and business model evolution. The paper demonstrates that higher data intensity accelerates cycle velocity and enhances adaptive capacity. The RADAR Framework extends dynamic capabilities theory into explicitly data-centric and recursive domains while offering executives a blueprint for designing learning architectures that institutionalize continuous renewal. Theoretical contributions and managerial implications underscore the shift from episodic transformation to embedded, feedback-driven adaptation. Future research directions for empirical testing across sectors are outlined.

Keywords Organizational learning, Dynamic capabilities, Strategic renewal, Digital enterprise, Adaptive systems, Data-intensive markets

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Introduction

Digital enterprises increasingly confront environments defined by unprecedented data velocity, technological convergence, and competitive hyper-velocity. In such data-intensive markets, survival depends less on initial resource endowments than on the capacity for continuous sensing, interpretation, and reconfiguration of strategic assets [1–5]. Legacy organizational models, optimized for stability and periodic renewal, prove insufficient when customer behaviors, supply-chain signals, and technological paradigms shift in real time. Consequently, scholars and

practitioners alike recognize the imperative for enterprises to operate as adaptive systems—entities that treat data not merely as input but as the medium through which learning and renewal become recursive and self-reinforcing [3, 6–8].

The adaptive-systems perspective draws from cybernetic principles and complex adaptive systems theory, yet its application to digital contexts introduces distinctive mechanisms. Data intensity amplifies feedback frequency, compresses decision cycles, and elevates the role of organizational learning from episodic activity to architectural core [9]. Strategic renewal, once

conceptualized as infrequent, large-scale reorientation, now manifests as perpetual micro-renewals embedded in daily operations [2, 10–17]. The dynamic capabilities literature has illuminated how firms reconfigure resources in the face of uncertainty [5, 6, 18]. Yet, few models explicitly integrate the recursive loops that link market signals back to internal learning architectures in data-rich settings [11, 13].

This gap is consequential. Incumbent firms frequently experience “digital inertia,” whereby legacy structures impede the translation of data insights into timely renewal [1, 12, 16]. Startups, conversely, may excel at sensing yet lack scalable learning mechanisms for sustained renewal [4, 7]. The present article addresses this fragmentation by advancing a unified conceptual framework that positions the digital enterprise as a recursive adaptive system. Organizational learning is reconceptualized as the central engine that converts environmental data into strategic intelligence, while recursive feedback loops ensure that renewal outcomes continuously recalibrate sensing and interpretation capacities [19–25].

The contribution is threefold. First, the paper synthesizes disparate streams—adaptive systems, organizational learning, dynamic capabilities, and strategic renewal—into a coherent process model tailored to data-intensive markets. Second, it introduces the RADAR Framework, a multi-layer architecture that makes explicit the mechanisms of sensing, learning, decision-making, reconfiguration, and recursive renewal. Third, it demonstrates how data intensity functions as both a moderator and accelerator of adaptive cycles, offering a theoretical lens for understanding why some digital enterprises achieve sustained agility while others falter.

Literature Synthesis and Conceptual Foundations

Contemporary scholarship converges on the proposition that digital enterprises function as adaptive systems whose survival hinges on the interplay of environmental responsiveness, internal learning processes, and strategic reconfiguration [1, 3, 11]. Recent research illustrates how large incumbents navigate four restructuring dilemmas through dynamic capabilities, underscoring the tension between legacy structures and adaptive imperatives [1]. Parallel work on legacy media firms traces strategic renewal trajectories during technological disruption, revealing that successful adaptation requires the deliberate

orchestration of learning mechanisms [2]. In entrepreneurial contexts, dynamic capabilities enable digital ventures to manage transformation under resource constraints, highlighting the micro-foundations of sensing and seizing in volatile markets [3, 7, 18].

Organizational learning emerges as the linchpin. Studies emphasize that digital firms must cultivate ambidextrous learning—simultaneously exploiting existing data assets and exploring novel configurations—to sustain renewal [9, 20, 24]. Digital transformation capabilities are amplified when leadership fosters continuous learning environments, thereby elevating organizational commitment and adaptive capacity [20]. Similarly, organizational learning culture drives strategic renewal through reconfiguration and digital transformation, particularly under crisis conditions [25]. These findings align with broader evidence that data-driven intelligence architectures institutionalize learning loops, converting raw signals into actionable knowledge [4, 8, 23].

Table 1 specifies the internal design logic of the RADAR Framework by linking each layer to its strategic function, enabling conditions, and characteristic failure risks.

Table 1. Layer-specific design logic of the RADAR framework: mechanisms, enablers, and failure conditions

RADAR layer	Core strategic function	Dominant mechanism	Required organizational enablers
Environmental sensing and data intake	Detect relevant shifts in markets, technology, operations, and regulation	Signal capture and dynamic filtering	Unified data infrastructure; external and internal data integration; real-time visibility
Interpretation and organizational learning	Convert signals into shared strategic meaning	Single-loop and double-loop learning; cross-functional sensemaking; AI-supported interpretation	Learning culture; psychological safety; analytical literacy; interpretive routines
Strategic decision and	Select and rank	Resource allocation,	Decision dashboards

prioritization	renewal initiatives under uncertainty	scenario comparison, and trade-off evaluation	governance routine execution alignment
Reconfiguration and execution	Translate priorities into operational and strategic change	Resource recombination, modular redeployment, process redesign	Agile structure, modular architecture, API-first system, experimental capacity
Renewal outcomes	Realize adaptive gains and feed them back into the system	Performance monitoring, resilience assessment, market-response capture	KPI ecosystem, feedback dashboards, outcome routine
Recursive feedback across layers	Recalibrate the full system using downstream results	Outcome-to-sensing feedback and in-cycle interpretive correction	Closed-loop review system, data governance, leadership commitment, inquiry
Data intensity accelerator (cross-layer moderator)	Increase cycle velocity and learning granularity	Compression of time-to-insight and enrichment of interpretive depth	Scalable analytics, cloud-native processing, data accessibility

Strategic Renewal, Dynamic Capabilities, and Data-Intensive Adaptation

The strategic renewal literature provides a critical complement to the RADAR perspective by conceptualizing renewal as an iterative, ongoing process rather than a discrete, episodic event. This shift reflects a broader movement in strategic management toward processual, temporally embedded views of adaptation, in which organizations continuously reconfigure themselves in response to evolving environmental conditions. Within this stream, research advances a strategic entrepreneurship

perspective on incumbent digital transformation, demonstrating how leadership orchestrates renewal through the dual mechanisms of opportunity recognition and resource recombination [17]. This work highlights that renewal is not merely reactive but is actively constructed through managerial cognition and intentional action.

Similarly, case-based evidence shows that the tension between cost efficiency and strategic renewal can only be resolved by deliberately integrating data analytics into renewal processes [21]. Rather than treating efficiency and renewal as competing priorities, findings suggest that data-driven decision-making enables organizations to pursue both simultaneously by improving resource allocation precision and reducing uncertainty. This insight is particularly salient in data-intensive environments, where the ability to rapidly interpret and act on information becomes a core determinant of competitive advantage.

In more specialized organizational contexts, such as family firms and high-reliability organizations, renewal is enabled by aligning internal microfoundations with external technological trajectories. Studies in these domains demonstrate that dynamic capabilities operate not as abstract constructs but as deeply embedded routines that connect individual cognition, team interaction, and organizational processes to broader environmental shifts [26–29]. These findings reinforce the idea that renewal capacity is distributed across multiple levels of analysis and must be understood as an emergent property of interconnected systems.

Recent integrative reviews and empirical syntheses further converge on the conclusion that digital transformation itself constitutes a form of strategic renewal when it is grounded in learning and reconfiguration routines [6, 10, 12, 13, 27]. Rather than being a one-off transformation initiative, digitalization becomes a continuous process through which organizations update their capabilities, business models, and value creation logics. This perspective aligns closely with the RADAR Framework’s emphasis on recursion and continuous adaptation, positioning digital transformation as both a driver and an outcome of ongoing renewal processes.

Dynamic Capabilities as the Foundational Mechanism

Dynamic capabilities theory provides the theoretical infrastructure for explaining how strategic renewal is enacted in practice. Recent contributions conceptualize digital transformation capabilities as higher-order routines that enable organizations to sense opportunities and threats, seize them through strategic action, and transform their resource base accordingly [5, 11, 13]. These capabilities are not static assets but evolving processes that are continuously refined through experience and learning.

Empirical extensions further elaborate the link between digital orientation and organizational resilience. Firms with a strong digital orientation are better able to withstand environmental shocks because their dynamic capabilities facilitate rapid reconfiguration and informed decision-making [8, 13]. Similarly, pattern-matching analyses identify configurations of digital maturity and capability development that support effective adaptation, demonstrating that multiple capability combinations can yield similar adaptive outcomes depending on contextual conditions [13].

At a more granular level, micro-foundational research provides critical insights into how dynamic capabilities are constructed and enacted. Studies focusing on individual cognition, team-level interaction, and organizational routines reveal that these micro-processes aggregate into higher-order capabilities that drive renewal [18, 19]. For example, the ability of individuals to interpret ambiguous data, the capacity of teams to integrate diverse knowledge, and the role of algorithms in augmenting decision-making all contribute to the organization's overall adaptive capacity.

Importantly, the role of feedback loops and learning architectures has received increasing attention, particularly in research on high-reliability organizations and resilience. These studies emphasize that the effectiveness of dynamic capabilities depends on the organization's ability to close adaptive cycles—linking outcomes back to upstream processes of sensing and interpretation. When these feedback loops are weak or absent, organizations risk falling into inertia, where past success reinforces outdated assumptions and inhibits adaptation [23, 26, 29]. This insight directly supports the RADAR Framework's emphasis on recursive learning as a central mechanism of renewal.

Data Intensity as a Moderator of Adaptive Velocity

While dynamic capabilities explain how organizations adapt, data intensity helps explain how fast and how effectively this adaptation occurs. Emerging research increasingly identifies data as a critical moderating variable that shapes the velocity and precision of adaptive processes. Recent studies show how startups leverage data-driven growth strategies to build resilience, enabling them to respond more effectively to environmental volatility [4]. These findings suggest that data not only informs decision-making but also enhances the organization's ability to anticipate and preempt disruptions.

Complementing this perspective, research highlights the synergistic interaction between knowledge sharing and leadership in fostering resilience under turbulent conditions [23]. This work demonstrates that data alone is insufficient; it must be embedded within social and organizational processes that facilitate its interpretation and application. This reinforces the notion that data intensity amplifies, rather than replaces, the importance of human and organizational factors in adaptation.

Further contributions map the pathways through which digital strategies institutionalize continuous adaptation [6, 10]. These studies emphasize the recursive nature of service innovation and digital transformation, showing how iterative cycles of experimentation, feedback, and refinement become embedded in organizational routines. Over time, these cycles create a self-sustaining system of renewal, where adaptation is no longer triggered by external shocks but is continuously generated from within.

Across diverse domains—including manufacturing, information systems, and innovation management—both empirical and conceptual research consistently converges on a common triad: sensing, learning, and renewal [15, 16, 22]. Despite its centrality, however, this triad remains insufficiently theorized in integrated form. Most studies examine these elements in isolation or treat their relationships as linear, thereby underexploiting the recursive and systemic nature of adaptation.

Toward an Integrative, Recursive Model of Adaptation

Despite the richness of the existing literature, a significant theoretical gap remains. Current frameworks tend to fall into two dominant categories. The first comprises linear models, which conceptualize adaptation as a sequential process moving from sensing to response. While analytically tractable, these models fail to capture the iterative and recursive dynamics observed in practice. The second category includes static models that focus on capability inventories, identifying which capabilities organizations possess but do not adequately explain how they are activated, combined, or evolved [14, 27].

Both approaches underplay the importance of feedback loops that connect downstream outcomes back to upstream processes of sensing and learning. As a result, they struggle to explain how organizations continuously recalibrate their perceptual and cognitive frameworks in response to new information. This limitation is particularly problematic in data-intensive environments, where the speed and volume of information flows require more dynamic and integrated models of adaptation.

The present synthesis therefore identifies a clear opportunity for theoretical advancement: the development of a multi-layer, recursive architecture that explicitly integrates learning, data, and adaptation. Such a model must position organizational learning as the central hub through which all adaptive processes are mediated, while recognizing data intensity as a key accelerator that shapes the speed and depth of these processes.

Table 2 distinguishes the RADAR Framework from both linear adaptation models and static capability-based explanations by clarifying its recursive, learning-centered logic of strategic renewal.

Table 2. Distinguishing linear adaptation from recursive adaptive renewal in digital enterprises

Analytical dimension	Linear adaptation model	Capability inventory model	RADAR recursive adaptive model
Underlying logic of adaptation	Sequential response to external change	Possession of a portfolio of valuable capabilities	Continuous recursive renewal through interconnected learning loop

Temporal structure	Episodic and stage-bound	Relatively static or periodically updated	Continuous cyclical, and self-reinforcing
Role of data	Input for decision episodes	Resource supporting selected capabilities	High-frequency adaptive medium shaping cycle speed and learning depth
Role of organizational learning	Secondary evaluative activity after action	Supporting condition for capability development	Central architectural hub that mediates all adaptive stages
View of strategic renewal	Infrequent repositioning after disruption	Outcome of strong capabilities	Perpetual micro-renewal embedded in daily organization functioning
Relationship between outcomes and upstream processes	Weak or delayed feedback	Often unspecified	Explicit recursive feedback from outcomes to sensing and interpretive schemas
Treatment of uncertainty	Managed through planning and response sequencing	Managed through capability readiness	Managed through iterative interpretation reprioritization and reconfiguration
Organizational design implication	Build better response chains	Build stronger capability stocks	Design learning-centered, feedback-rich modular adaptive architecture

Failure risk	Slow response and lagged adaptation	Capability rigidity or misfit	Signal overload, interpretive bottlenecks, blocked recursive feedback
Source of sustained advantage	Better response quality	Superior capability-based	Institutionalized capacity to renew strategies faster and more intelligently than rivals

The RADAR Framework, developed in the following section, directly addresses this gap. By synthesizing insights from the strategic renewal, dynamic capabilities, and digital transformation literatures, it offers a processual, visually mappable representation of the digital enterprise as an adaptive system. In doing so, it moves beyond linear and static conceptions, providing a comprehensive account of how organizations sense, learn, reconfigure, and renew in a continuously evolving environment.

Adaptive System Architecture Section

The adaptive system architecture of the digital enterprise: Introducing the RADAR framework

Building upon the synthesized foundations, this section introduces the Recursive Adaptive Digital Architecture for Renewal (RADAR Framework). This novel conceptual model operationalizes the digital enterprise as a recursive adaptive system. The RADAR Framework comprises five interconnected layers with organizational learning at the architectural core and recursive feedback loops linking renewal outcomes back to initial sensing. It explicates how data-intensive inputs are progressively transformed into strategic renewal, thereby extending dynamic capabilities and organizational learning theories into an explicitly cyclical, data-centric architecture [5, 9, 20, 26].

The first layer—environmental sensing and data intake—captures heterogeneous signals from data-rich markets, including customer behaviors, competitive moves,

technological trajectories, and regulatory shifts. Advanced analytics platforms and IoT infrastructures enable real-time, granular intake, consistent with sensing routines identified in dynamic capabilities research [8, 22].

The second layer—interpretation and organizational learning—processes ingested data through single- and double-loop mechanisms. Here, cross-functional teams and AI-augmented analytics convert raw signals into shared mental models and updated knowledge stocks, embodying the learning architectures emphasized in recent studies [9, 20, 24, 25]. Organizational learning serves as the central hub, with bidirectional flows that continuously refine sensing filters as interpretive insights evolve.

The third layer—strategic decision and prioritization—translates learned insights into prioritized initiatives. Leadership teams employ data-visualization dashboards and scenario-planning tools to allocate resources in the face of uncertainty, aligning with strategic entrepreneurship perspectives on renewal [17, 21].

The fourth layer—reconfiguration and execution—translates decisions into tangible changes in resources, processes, and business models. Modular digital platforms facilitate rapid resource recombination and capability redeployment, mirroring micro-foundational reconfiguration processes [18, 28].

The fifth layer—renewal outcomes—manifests as enhanced agility, resilience, market positioning, and performance metrics. Crucially, these outcomes feed back recursively into the sensing layer via performance dashboards and market-response signals, closing the adaptive loop and enabling perpetual refinement [2, 23, 26, 29]. Data intensity moderates the velocity and precision of each cycle: higher data volumes compress cycle time while enriching learning depth, as shown in Figure 1.

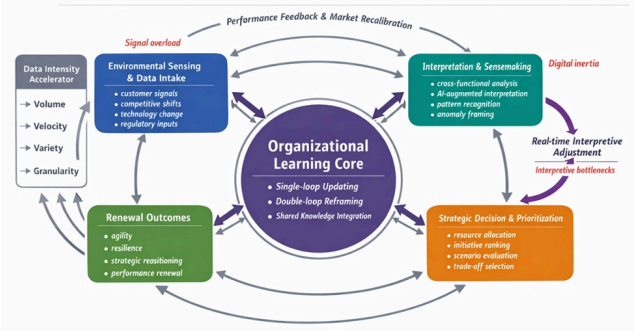


Figure 1. Adaptive system architecture of the digital enterprise

Collectively, the RADAR Framework renders the digital enterprise as a living adaptive system in which learning is not ancillary but constitutive, and renewal is perpetual rather than episodic. It provides both theoretical coherence and a practical blueprint for embedding adaptive mechanisms within digital architectures.

Strategic Renewal Through Organizational Learning

The RADAR Framework fundamentally repositions organizational learning from a peripheral, supportive activity to the generative core of strategic renewal in data-intensive environments. In contrast to traditional models that conceptualize learning as retrospective—occurring after strategic action has already been taken—the RADAR perspective treats learning as continuous, embedded, and constitutive of strategy itself. Learning is not merely evaluative but generative: it actively shapes how organizations perceive, decide, and reconfigure in real time. This shift aligns with the logic of double-loop learning, in which organizations do not simply adjust actions within existing assumptions but interrogate and transform those assumptions themselves [9, 20, 24, 25].

Within this architecture, learning unfolds recursively across interconnected layers. Insights generated during the interpretation stage (Layer 2) do not remain localized; instead, they cascade forward and backward across the system. For example, new interpretive frames may trigger reprioritization decisions in Layer 3, which in turn influence how resources are recombined in Layer 4. These reconfigurations ultimately reshape market positioning and competitive logic in Layer 5. Crucially, this process is not linear or terminal. Outcomes feed back into the sensing layer, recalibrating what the organization notices, how it filters signals, and which anomalies it considers strategically relevant. Strategic renewal thus becomes endogenous: rather than reacting to external shocks, the organization continuously reconstructs itself from within, evolving at a pace that can outstrip environmental turbulence [2, 17, 21, 26].

This recursive learning dynamic is significantly intensified in data-rich contexts. Data intensity compresses the temporal structure of learning cycles, transforming them from

periodic, discrete events—such as quarterly reviews or annual strategy updates—into near-continuous processes of micro-adjustment [4, 8, 23]. With access to high-frequency, granular data streams, organizations can detect weak signals and emerging patterns far earlier than traditional systems allow. These signals, when processed through advanced analytics and AI-driven interpretation, enable proactive experimentation rather than reactive adaptation. For instance, firms leveraging AI-augmented analytics platforms can translate subtle shifts in customer behavior or market conditions into rapid business-model experiments, thereby institutionalizing renewal as an ongoing capability rather than an episodic intervention [6, 10, 13].

Recursive Learning and Reconfiguration Systems

A defining feature of the RADAR Framework is its emphasis on recursive feedback loops, which distinguish it from more linear conceptions of dynamic capabilities. Two primary feedback structures operate simultaneously. The first is a short, inner loop that functions within a single cycle, refining interpretation and prioritization decisions in real time. This loop enhances decision quality by continuously updating the organization's understanding of unfolding conditions. The second is a longer, outer loop that connects outcomes back to the sensing layer, updating data filters, interpretive schemas, and learning protocols themselves [23, 26, 29].

These dual loops create a self-reinforcing system of organizational intelligence. Successful reconfigurations expand the firm's absorptive capacity—its ability to recognize, assimilate, and apply new knowledge—thereby increasing the effectiveness of future sensing and interpretation. Conversely, failed experiments are not treated as losses but as high-value negative feedback. They sharpen the organization's perceptual accuracy, refine its hypotheses, and recalibrate its strategic assumptions. Over time, this iterative process produces a compounding effect: the organization becomes progressively better at learning how to learn, enhancing both speed and precision in adaptation [19, 22].

Reconfiguration, within this framework, is not a disruptive or destabilizing process but rather a modular, low-friction activity. Digital infrastructures play a critical role in enabling this shift. By decoupling legacy systems from emergent

capabilities, organizations can reconfigure specific components without overhauling the entire system. The RADAR Framework highlights the importance of microfoundations in this process—individual cognition, team-level collaboration, and algorithmic decision-support systems—which collectively enable rapid and coordinated resource redeployment [18, 28].

In data-intensive environments, this modularity is further amplified by API-first architectures and cloud-native infrastructures. These technologies reduce the marginal cost of experimentation, allowing organizations to test multiple renewal initiatives in parallel without committing to large-scale, irreversible investments [5, 11, 16]. As a result, strategic renewal transitions from a high-stakes, episodic transformation process to a continuous series of low-amplitude adjustments. While each adjustment may appear incremental, their cumulative effect can be profoundly transformative, enabling organizations to evolve continuously without experiencing the inertia typically associated with large-scale change.

Data-Intensive Adaptation Mechanisms: Accelerating Cycle Velocity

Within the RADAR architecture, data intensity operates as both a moderator and an accelerator of adaptive capacity. At lower levels, data primarily serves as an input to the sensing and interpretation layers, providing the raw material for organizational learning. However, as data volume, velocity, and variety increase, its role becomes more transformative. High data intensity fundamentally alters the system's temporal and cognitive dynamics, enabling faster cycles and deeper learning simultaneously [4, 8, 23].

The framework formalizes this relationship through two key mechanisms. First, cycle velocity—the time required to move from sensing to renewal outcome—decreases logarithmically as data volume increases. This reflects diminishing time intervals between detection, interpretation, decision, and action. Second, learning depth—captured by the sophistication and complexity of updated mental models—increases linearly with data richness. More diverse, granular data enables organizations to construct more nuanced representations of their environment, improving both predictive accuracy and strategic insight.

The interaction of these two effects explains why digitally mature firms operating in turbulent environments can sustain continuous renewal while avoiding the inertia that constrains less data-intensive organizations [1, 12, 15]. Rather than being overwhelmed by complexity, these firms leverage data to structure and accelerate their learning processes. Importantly, this capability is not purely technological; it depends on integrating data infrastructures with organizational routines, cognitive frameworks, and decision-making processes. Data alone does not generate adaptation—learning systems do.

Embedding the RADAR Framework in Digital Enterprise Design

Translating the RADAR Framework from a conceptual model to operational reality requires deliberate, coordinated design choices across all organizational layers. At the sensing level, firms must invest in unified data platforms that integrate internal and external data sources to ensure comprehensive, real-time visibility. These platforms should support not only data collection but also dynamic filtering and prioritization mechanisms that evolve with the organization's learning processes.

At the interpretation layer, the emphasis shifts to cross-functional learning communities. These communities facilitate the integration of diverse perspectives, enabling richer sensemaking and reducing the risk of cognitive bias or siloed thinking. At the prioritization layer, executive dashboards and decision-support systems must be designed to reflect not only performance metrics but also uncertainty, signal strength, and strategic trade-offs.

Reconfiguration requires modular process architectures that allow for rapid experimentation and resource redeployment without disrupting core operations. This includes adopting digital twins, sandbox environments, and agile development practices that support iterative testing and refinement. Finally, the outcomes layer must be supported by real-time KPI ecosystems that capture both leading and lagging indicators, ensuring that feedback loops are closed effectively and continuously [3, 7, 20].

Leadership plays a pivotal role in orchestrating this system. Rather than acting solely as decision-makers, leaders become curators of the organizational learning environment. This involves fostering psychological safety to

encourage double-loop inquiry, where assumptions can be challenged without fear of reprisal. It also requires actively managing power dynamics to ensure that feedback signals are not suppressed or distorted by hierarchical structures [17, 24, 25].

By institutionalizing these architectural and cultural elements, organizations can fully operationalize the RADAR Framework. The result is a shift from episodic digital transformation—characterized by discrete, large-scale change initiatives—to a state of perpetual adaptive renewal. In this state, learning is continuous, strategy is emergent, and the organization evolves as a living system, dynamically aligned with an ever-changing environment.

Conclusion

The RADAR Framework advances strategic management and information systems scholarship by theorizing the digital enterprise as a fully recursive, adaptive system in which organizational learning, strategic renewal, and data-driven feedback loops operate as interdependent, self-sustaining mechanisms. Theoretical contributions include (1) the elevation of recursive feedback from peripheral construct to architectural necessity, (2) the reconceptualization of learning as the central hub rather than an ancillary process, and (3) the specification of data intensity as a quantifiable moderator of adaptive velocity.

For practice, the framework supplies executives with a diagnostic and design tool: leaders can audit existing digital architectures against the five layers and recursive loops, identifying gaps that impede renewal. In an era of unrelenting technological and market turbulence, firms that

embed RADAR principles will move beyond reactive transformation to proactive, continuous evolution.

Future research should empirically test the framework's propositions through longitudinal case studies and configurational analyses across sectors, examining how variations in data intensity and learning maturity influence renewal outcomes. Comparative investigations of high-versus low-performing digital enterprises would further validate the causal pathways articulated herein. Ultimately, the RADAR Framework underscores a fundamental shift in managerial cognition: in data-intensive markets, the most durable competitive advantage is no longer a superior strategy but the institutionalized capacity to renew strategy perpetually through adaptive, learning-driven systems.

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