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Strategic Leadership in Algorithmically Mediated Organizations: Managing Firms Where Data-Driven Systems Inform Decision Authority

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Abstract

In an era of rapid digital transformation, strategic leadership is undergoing a profound shift as organizations increasingly embed algorithmic systems into core decision processes. This managerial perspective article examines leadership in algorithmically mediated organizations, where data-driven systems do not merely support but actively inform, shape, and at times constrain managerial authority. Drawing on recent peer-reviewed scholarship, the analysis highlights how traditional command-and-control models are giving way to hybrid human-algorithm governance arrangements. Key themes include the redistribution of decision authority, the interpretive role of leaders in translating algorithmic outputs into strategic action, and the persistent need for human accountability amid automation. The article identifies critical tensions—such as over-reliance on machine recommendations, conflicts between managerial intuition and algorithmic logic, and diffused responsibility for system-informed outcomes—and proposes a strategic leadership framework centered on algorithmic interpretation capability, structured oversight mechanisms, accountability architectures, judgment integration, and adaptive governance loops. Practical guidance is offered for executives seeking to retain strategic control while harnessing algorithmic efficiencies. Ultimately, effective leadership in these contexts demands new capabilities that elevate managers from decision executors to system orchestrators, ensuring that data-driven authority enhances rather than erodes organizational agility and ethical stewardship. This perspective contributes to digital business and management studies by offering a forward-looking roadmap for navigating the evolving boundary between human judgment and algorithmic mediation.

Keywords Algorithmic management, Strategic leadership, Data-driven decision authority, Human-algorithm coordination, AI governance, Authority redistribution

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Introduction

The contemporary business landscape is defined by the pervasive integration of algorithmic systems into organizational decision-making infrastructures. Once confined to routine operational tasks [1], algorithms now permeate strategic domains, from resource allocation and performance evaluation to market positioning and risk assessment [2]. This evolution has given rise to

algorithmically mediated organizations [3]—entities in which data-driven systems do not merely augment but actively inform and, in many instances, partially supplant traditional managerial authority [4]. Strategic leaders today operate in environments where decision authority is distributed across human actors and automated agents [5], creating both unprecedented efficiencies and novel governance challenges [6].

The transformation is not incremental but structural. Algorithmic management systems process vast datasets in real time [7], generate predictive insights, and recommend or even automate courses of action that historically rested solely with senior executives [8]. As a result, the locus of authority is shifting from individual managers to hybrid socio-technical assemblages [9]. Leaders must now navigate a context in which algorithmic outputs carry significant organizational weight [10], yet remain fallible, opaque, and contextually limited. This redistribution raises fundamental questions about accountability, strategic judgment [11], and the very definition of leadership in digitally transformed firms [12].

Scholarly discourse has begun to document these dynamics across multiple streams. Research on algorithmic management underscores its capacity to standardize processes [1] while simultaneously introducing new forms of managerial control and worker surveillance [13]. Parallel streams in strategic management and information systems highlight the implications for decision authority [14], noting that AI-informed systems can enhance speed and consistency yet risk diminishing the role of experiential intuition [15]. Studies of human-algorithm coordination emphasize the interpretive labor required of leaders to translate black-box recommendations into actionable strategy [16, 17]. Moreover, investigations into data-driven governance reveal persistent tensions around transparency, bias, and ethical oversight [18] when algorithms assume quasi-authoritative roles [19].

Despite these advances, a coherent managerial perspective on strategic leadership in such settings remains underdeveloped. Existing work has largely focused on operational or workforce implications [20], with less attention to the strategic challenges faced by C-suite executives at the apex [21]. This article addresses that gap by adopting an explicitly managerial and strategic lens. It argues that effective leadership in algorithmically mediated organizations hinges on the ability to govern, interpret, and selectively challenge data-driven systems [22] rather than passively defer to them. Leaders must cultivate capabilities that bridge algorithmic precision with human foresight [23], ensuring that automation serves rather than supplants strategic intent.

The article proceeds in two main sections. First, it delineates the strategic challenges confronting leaders when decision authority is algorithmically mediated. Second, it presents a practical framework for managing this

new reality, including a visual architecture that maps the interplay between data inputs, algorithmic processing, managerial interpretation, and organizational outcomes. Throughout, the analysis draws on peer-reviewed literature to ground its arguments in established scholarship while offering forward-looking guidance for practice. By focusing on the executive perspective, the article equips strategic leaders with the conceptual tools and actionable principles needed to thrive in firms where algorithms increasingly inform—if not dictate—decision authority. In doing so, it underscores a central thesis: the future of strategic leadership lies not in resisting algorithmic mediation but in mastering its governance.

Strategic Challenge of Leadership in Algorithmically Mediated Organizations

Strategic leaders in algorithmically mediated organizations confront not merely incremental change, but a fundamental reconfiguration of authority itself. Historically, decision rights were anchored in hierarchical roles, where formal positions conferred both legitimacy and the responsibility to define strategic direction. In contrast, contemporary organizations increasingly distribute decision influence across human actors and algorithmic systems that generate recommendations with de facto authority [1, 7]. These systems do not formally “decide,” yet their outputs shape agendas, frame available options, and subtly delimit the boundaries of managerial choice. As a result, authority becomes hybridized—simultaneously human and machine-mediated—creating a core strategic challenge: how leaders can exercise meaningful agency when data-driven outputs actively structure, constrain, or even preempt discretionary judgment [3, 11]. Executives must therefore operate in an environment where algorithmic recommendations carry an implicit claim to objectivity, despite being rooted in historically contingent data and predefined optimization logics that may not fully capture evolving strategic contexts [12, 16].

A central risk emerging from this reconfiguration is over-reliance on automated recommendations. Algorithmic systems are highly effective at pattern recognition, prediction, and scalability, enabling organizations to process volumes of data far beyond human cognitive capacity. However, these systems operate within bounded rationality defined by the scope of their training data, embedded assumptions, and objective functions [8, 20].

They are inherently backward-looking, extrapolating from past patterns rather than anticipating discontinuities or paradigm shifts. Leaders who treat algorithmic outputs as inherently reliable risk falling into a state of strategic myopia, in which local optimization displaces broader considerations such as innovation trajectories, ethical implications, stakeholder expectations, and long-term organizational resilience [24–27]. Empirical and conceptual research documents multiple instances in which organizations experienced governance breakdowns when managerial judgment was subordinated to algorithmic logic, resulting in the amplification of embedded biases, the entrenchment of path dependencies, or the failure to detect emergent market inflections [9, 19]. This vulnerability is particularly acute in volatile or rapidly changing environments, where real-time data streams privilege short-term efficiency gains while obscuring signals that require interpretive foresight and strategic imagination [5, 23].

Equally significant are the frictions that arise between managerial intuition and machine-generated outputs. Experienced executives draw on tacit knowledge, accumulated judgment, contextual sensitivity, and ethical reasoning—forms of intelligence that are deeply embedded in practice and difficult to codify within algorithmic architectures [22, 25]. When algorithmic recommendations diverge from such intuition, leaders are confronted with a consequential dilemma: to override the system and risk being perceived as subjective or inconsistent, or to comply with the algorithm and potentially compromise strategic intent, organizational values, or ethical standards [13, 15]. This tension extends beyond operational decision-making; it strikes at the core of strategic agency and leadership legitimacy. Research on human–algorithm coordination indicates that unresolved divergence between human judgment and system outputs can erode confidence in leadership, create decision paralysis, and foster organizational inertia, as actors become uncertain about which authority source should prevail [16, 17]. Over time, such dynamics may lead to the institutionalization of passive compliance, where algorithmic outputs are followed not because they are superior, but because contesting them becomes organizationally costly.

Accountability further complicates the leadership landscape in algorithmically mediated settings. As decisions become increasingly system-informed, the attribution of responsibility grows ambiguous. When an algorithmic recommendation leads to adverse outcomes, it is often unclear whether liability resides with the system designers.

These data scientists trained the model, the managers who implemented its outputs, or the organization as a collective entity [14, 18]. Traditional governance structures are predicated on clear lines of authority and responsibility, yet algorithmic mediation diffuses these lines, creating gaps in both internal accountability and external regulatory compliance [10, 13]. This diffusion introduces significant legal, ethical, and reputational risks, particularly in highly regulated industries or contexts involving stakeholder harm. Leaders must therefore navigate a delicate balance: leveraging the analytical power of algorithmic systems while retaining unequivocal ownership of decision outcomes. Without explicit accountability mechanisms, organizations risk drifting into a governance vacuum characterized by distributed responsibility and diffused blame, undermining both strategic control and institutional legitimacy [15, 21].

Compounding these challenges is the interpretive burden placed on leaders. Algorithmic systems frequently lack transparency, especially when based on complex machine learning models that function as “black boxes,” producing outputs without readily accessible explanations of underlying reasoning [2, 6]. Consequently, strategic leaders must engage in sophisticated processes of sense-making, interrogating outputs, contextualizing them within broader strategic narratives, and determining their relevance to specific organizational objectives [7, 11]. This interpretive work is not optional; it is central to maintaining strategic agency. Leaders who fail to critically engage with algorithmic outputs risk becoming passive intermediaries—overseeing the execution of system-generated decisions rather than actively shaping them [4, 20]. Recent scholarship cautions that such passive dependence can lead to a gradual erosion, or “hollowing out,” of strategic leadership capacity, as critical thinking, judgment, and foresight are progressively displaced by automated reasoning [23, 26]. **Table 1** identifies four distinct configurations of authority in algorithmically mediated organizations and clarifies how different leadership postures alter the balance between algorithmic influence, managerial judgment, and accountability.

Table 1. Modes of authority configuration in algorithmically mediated organizations

Authority configuration	Primary source of decision influence	Role of a strategic leader	Typical organizational benefits

Human-dominant authority	Senior managerial judgment, hierarchy, experiential interpretation	Final decider and principal sense-maker	High contextual sensitivity, strong ethical discretion, clear personal ownership
Algorithm-supported authority	Human decision-making informed by advisory analytics and recommendations	Evaluator of system outputs; retains explicit decision sovereignty	Better evidence, faster and improved consistency without surrendering control
Hybrid co-mediated authority	Joint influence of algorithms and leaders through structured interaction	Orchestrator of escalation, override, and integration protocols	Balance of speed, judgment, governance, strong learning potential
Algorithm-dominant authority	Automated or quasi-automated recommendation logic with minimal human intervention	Exception handler or post-hoc monitor	High scalability, efficiency, standardization
Governed adaptive authority	Dynamic redistribution of influence according to risk, novelty, and consequence	Meta-governor who calibrates when human judgment or algorithmic efficiency should dominate	Strategic flexibility, resilience, explicit authority design, strong legitimacy

Importantly, these challenges do not operate in isolation but interact in mutually reinforcing ways, creating a systemic threat to organizational coherence. Over-reliance on

algorithmic outputs diminishes the exercise of judgment; deficits in interpretive capability weaken oversight; and ambiguity in accountability structures increases exposure to ethical and legal risks [8, 19]. Together, these dynamics can produce organizations that are highly efficient in execution yet strategically fragile, lacking the integrative capacity to navigate complexity, uncertainty, and change. The strategic imperative, therefore, is not to resist algorithmic systems, but to reframe leadership as the active orchestration of human–algorithm hybrids. In this view, leadership involves designing and governing the interaction between computational intelligence and human judgment to preserve strategic intentionality. Executives must move beyond passive acceptance of algorithmic authority toward proactive governance practices that embed human oversight, critical evaluation, and contextual reasoning at key decision points [5, 9]. This shift requires the development of new capabilities—combining technical literacy with critical reflexivity—as well as organizational architectures that deliberately position human judgment where it adds the greatest strategic value [12, 22]. Absent such adaptation, firms risk ceding strategic direction to systems optimized for narrow performance metrics rather than holistic and sustainable value creation.

The following section translates these theoretical insights into a practical managerial framework designed to address these interrelated challenges while enabling effective leadership in increasingly data-driven organizational contexts.

Governing AI-Informed Firms: A Strategic Leadership Framework for Data-Driven Decision Systems

To operationalize strategic leadership amid algorithmic mediation, executives require a structured yet flexible framework that explicitly addresses authority redistribution while preserving human agency. The proposed framework—Strategic Leadership Architecture in Algorithmically Mediated Organizations—comprises five interdependent components: (1) algorithmic interpretation capability, (2) human oversight and escalation mechanisms, (3) decision accountability structures, (4) strategic judgment integration protocols, and (5) organizational learning and feedback loops. Together, these elements enable leaders to govern

rather than merely administer data-driven systems [7, 11, 16].

Figure 1 presents the strategic leadership architecture that combines algorithmic inputs, executive interpretation, judgment integration, accountability mechanisms, and adaptive feedback to preserve human strategic control in algorithmically mediated organizations.

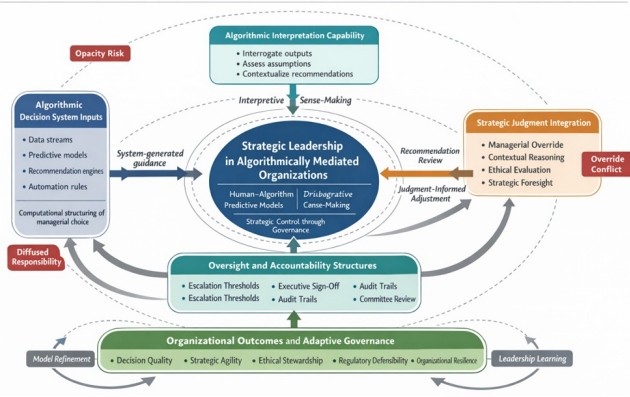


Figure 1. Strategic leadership architecture in algorithmically mediated organizations. The figure is a cyclical flow diagram with four primary layers connected by directional arrows and feedback loops.

Algorithmic interpretation capability forms the foundation. Leaders must cultivate the skill to decode outputs, interrogate assumptions, and map recommendations against strategic objectives [2, 17, 23]. This component requires training in data literacy without demanding coding expertise, focusing instead on critical questioning of model confidence intervals and edge cases [6, 12].

Human oversight and escalation mechanisms provide structured intervention points. The framework mandates predefined thresholds—risk levels, confidence scores, or deviation from historical norms—at which algorithmic recommendations trigger mandatory managerial review or escalation to executive committees [10, 13, 18]. Such mechanisms prevent automation from defaulting to authority while maintaining speed for routine decisions.

Decision accountability structures clarify responsibility chains. Each system-informed decision is logged with explicit attribution: algorithmic contribution, interpretive adjustments, and final sign-off [14, 15, 21]. These structures include audit trails and periodic third-party reviews to ensure transparency and regulatory alignment.

Strategic judgment integration protocols embed human foresight into the architecture. Protocols require leaders to maintain “judgment overrides” as a documented, non-punitive practice, supported by post-hoc rationales that feed organizational learning [22, 25, 27]. This component transforms potential conflicts into deliberate strategic refinement (Table 2).

Table 2. Executive governance mechanisms for preserving strategic control under algorithmic mediation

Framework component	Executive governance mechanism	Strategic question addressed	Risk mitigation
Algorithmic interpretation capability	Structured output interrogation protocol requiring leaders to review assumptions, confidence levels, edge cases, and omitted contextual factors	What does the system actually know, and what might it be missing?	Blind deference to technical output objects
Human oversight and escalation mechanisms	Tiered escalation matrix based on decision materiality, ethical sensitivity, financial exposure, and reputational consequence	When must human judgment interrupt or overrule automation?	Unchecked automation; high-risk decisions
Decision accountability structures	Triple-attribution record capturing algorithmic contribution, managerial adjustment,	Who owns this outcome, and how was authority exercised?	Diffused responsibility; positive blame

	and final executive sign-off		
Strategic judgment integration protocols	Formal judgment register documenting leader overrides, rationale, contextual variables, and subsequent outcomes	When should experienced judgment prevail over algorithmic recommendation?	Support of internal controls and reasoning
Organizational learning and feedback loops	Periodic recalibration forum linking outcome reviews, model retraining, governance redesign, and capability development	How should the organization learn from decisions informed by both humans and algorithms?	Stakeholder governance representation model integration
Cross-component integrative mechanism	Executive algorithm stewardship office coordinating analytics, strategy, legal, compliance, and operations	How can hybrid authority be governed as an enterprise-wide architecture rather than a fragmented set of tools?	Siloed governance inconsistent protocols across functions

Finally, organizational learning and feedback loops close the cycle. Execution outcomes are systematically routed back to refine both algorithms and leadership practices, creating adaptive governance rather than static rules [5, 9, 19]. Collectively, the framework equips leaders to manage firms in which data-driven systems inform decision-making without relinquishing strategic control. Implementation begins with executive-level mapping of current decision flows against the architecture, followed by capability-building programs and pilot governance protocols. Firms

that adopt this approach avoid blind reliance on systems and convert algorithmic mediation into a source of sustained competitive advantage.

Developing Executive Competencies for Human-Algorithm Symbiosis

The five-component framework introduced earlier gains operational force only when leaders internalize it as a set of cultivable competencies rather than abstract principles. Each element demands targeted development at the executive level, transforming the strategic challenge of authority redistribution into a source of competitive differentiation [7, 11, 16].

Algorithmic interpretation capability

Executives must move beyond the passive acceptance of algorithmic outputs and develop the capacity for disciplined interrogation. At its core, this competency requires what scholars and practitioners increasingly describe as “algorithmic fluency”: the ability to understand how algorithmic systems generate recommendations, evaluate the reliability of confidence scores, recognize potential blind spots in training data, and assess whether outputs adequately reflect contextual realities that resist quantification [2, 17, 23]. Such realities may include geopolitical instability, cultural variation across markets, emerging stakeholder sensitivities, or reputational risks that remain invisible within model parameters. In this sense, algorithmic interpretation is not a technical exercise alone, but a strategic capability that enables leaders to position algorithmic outputs within a broader field of organizational judgment. Firms that institutionalize this capability through executive academies, leadership development programs, and cross-functional decision training report fewer instances of strategic misalignment, largely because leaders learn to approach algorithmic recommendations as provisional hypotheses to be tested rather than definitive verdicts to be obeyed [6, 12]. Without this interpretive capability, executives are more likely to defer to system outputs by default, gradually displacing managerial reasoning and eroding the very judgment that algorithmic tools were intended to strengthen.

Human oversight and escalation mechanisms

Effective governance depends not merely on the presence of human oversight in principle, but on the existence of clearly codified intervention protocols in practice. Within this framework, leaders establish tiered escalation matrices that specify when algorithmic decision-making can proceed autonomously and when human intervention becomes mandatory. Routine, low-risk, and repetitive decisions may remain primarily algorithmic to preserve speed and efficiency. By contrast, decisions carrying significant strategic, financial, legal, or reputational consequences—such as capital allocation above a predefined threshold, major brand repositioning, mergers and acquisitions, or workforce restructuring—must trigger mandatory human review within clearly defined time windows [10, 13, 18]. The value of these escalation mechanisms lies in their ability to preserve the operational advantages of automation while ensuring that moments of strategic consequence remain subject to executive scrutiny and veto power. In this way, governance is not slowed indiscriminately; rather, it is selectively intensified where judgment matters most. Organizations that adopt such matrices are better positioned to avoid the governance vacuum documented in earlier studies of unchecked automation, in which responsibility became diluted and consequential decisions were made without meaningful managerial intervention [14, 15].

Decision accountability structures

Clarity of responsibility is a foundational requirement of algorithmically augmented governance. In the absence of explicit accountability structures, organizations risk creating environments in which algorithmic authority expands while human ownership recedes. To address this problem, the framework mandates that every system-informed decision carry a three-part attribution tag: first, an indication of the algorithmic contribution percentage; second, a record of the interpretive adjustments or contextual modifications introduced by the responsible leader; and third, a final executive sign-off confirming ownership of the decision outcome [21, 28, 29]. This attribution logic makes the respective roles of machine recommendations and human judgment visible, thereby reducing ambiguity about who is accountable for the final action. Supporting this structure are digital audit trails that document decision pathways over time and are reviewed quarterly by cross-functional oversight committees composed of leaders from strategy, compliance, operations, legal, and technology functions [19, 24]. These review processes serve both internal and external purposes: internally, they provide a basis for

organizational learning, process refinement, and model improvement; externally, they enhance defensibility under regulatory scrutiny and public accountability pressures. By converting diffuse accountability into a transparent chain of stewardship, this structure protects organizations and executives alike from the liability traps that emerge when algorithms are effectively granted authority without named human ownership.

Strategic judgment integration protocols

Rather than treating intuition and analytics as competing logics, the framework conceptualizes divergence between managerial judgment and algorithmic recommendation as a valuable source of organizational intelligence. To operationalize this principle, leaders maintain a formal “judgment register,” defined as a documented, non-punitive log of overrides in which executives record when they depart from algorithmic advice, why they do so, and the strategic rationale for the alternative course of action [22, 25, 27]. This mechanism serves several purposes simultaneously. First, it legitimizes the exercise of managerial discretion by making clear that overrides are not signs of non-compliance, but integral components of responsible strategic leadership. Second, it creates a structured repository of contextual reasoning that can later inform post-decision evaluation, organizational reflection, and model retraining. Third, it allows firms to identify recurring patterns in override behavior, which may reveal persistent model weaknesses, underrepresented variables, or emerging strategic conditions not yet captured in the data environment. In this way, the protocol transforms what might otherwise be framed as a conflict between humans and machines into a cycle of continuous organizational learning. Firms that adopt such practices frequently report higher innovation velocity and more adaptive strategic responses, because humans often surface opportunities, threats, and market inflections that purely data-driven systems fail to detect [5, 9].

Conclusion

The architecture is incomplete without closed-loop adaptation. Execution outcomes—both quantitative KPIs and qualitative post-mortems—are systematically routed back to refine algorithmic parameters and leadership practices alike. Annual “algorithmic governance summits” bring together the C-suite, data scientists, and frontline

managers to recalibrate the entire system. This component ensures that the organization evolves as a learning socio-technical entity rather than a static hierarchy augmented by code.

Practical pathways to implementation: safeguarding strategic control

Translating the framework from concept to operating reality begins with a diagnostic mapping exercise. Senior leadership teams chart every major decision flow, identifying where algorithmic systems currently inform authority and where human intervention points are missing or weak. The resulting “mediation heatmap” highlights immediate priorities—typically high-impact domains such as pricing strategy, talent allocation, or supply-chain reconfiguration.

Capability-building follows. Rather than generic digital training programs, firms design bespoke leadership modules that pair data scientists with executives in simulated decision-making scenarios. These modules emphasize the five competencies through role-play, bias-detection drills, and override justification exercises. Parallel organizational redesign creates dedicated “algorithm stewardship offices” that report directly to the CEO, ensuring governance does not become fragmented across functions.

To avoid governance failures, leaders install three safeguards. First, ethical red-teaming protocols stress-test algorithms for bias amplification before deployment. Second, “sunset clauses” require periodic human re-authorization of any automated decision rule after twelve months. Third, executive dashboards display not only algorithmic confidence but also explicit risk flags for strategic blind spots. These safeguards convert potential blind dependence into controlled augmentation.

Firms that follow this pathway report measurable gains: faster yet more resilient decisions, reduced regulatory exposure, and elevated employee trust in leadership’s ability to remain in command. The ultimate test of success is whether algorithmic mediation amplifies rather than supplants strategic intent—whether leaders emerge as orchestrators who harness data-driven precision while retaining the human capacity for visionary judgment.

Reimagining strategic leadership for the algorithmic age

Algorithmically mediated organizations represent more than a technological upgrade; they constitute a fundamental reconfiguration of authority that demands a parallel evolution in strategic leadership. The evidence synthesized across the literature is unambiguous: passive acceptance of data-driven systems leads to governance erosion, while active orchestration yields sustained advantage.

The proposed framework and its implementation pathways offer executives a concrete route forward. By institutionalizing interpretive mastery, structured oversight, explicit accountability, judgment integration, and adaptive learning, leaders can govern hybrid decision systems without surrendering strategic sovereignty. The required capabilities—algorithmic fluency paired with reflexive judgment—are neither innate nor optional; they must be deliberately cultivated at the highest levels of the firm.

In the final analysis, the future of strategic leadership lies in mastering the boundary between human foresight and algorithmic efficiency. Organizations that succeed will treat algorithms not as autonomous authorities but as powerful co-pilots whose recommendations are always subject to executive navigation. Those that fail to adapt risk becoming hostage to systems optimized for narrow metrics rather than holistic value creation.

Strategic leaders who embrace this hybrid reality will redefine competitive advantage in the algorithmic era—not by resisting mediation, but by orchestrating it with wisdom, accountability, and foresight. The architecture presented here equips them to do exactly that.

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