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When Algorithms Inform Managerial Judgment: Exploring the Organizational Implications of Data-Driven Decision Processes in Digitally Transformed Firms

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Abstract

The rapid integration of algorithmic systems into organizational decision-making has transformed how managers exercise judgment in digitally transformed firms. This managerial and strategic perspective article explores the implications of data-driven decision processes, where algorithms increasingly inform rather than supplant human insight. Synthesizing published studies, the analysis focuses on the interaction between human judgment and algorithmic recommendations, managerial reliance on predictive analytics, and the resulting need for organizational redesign and governance. Key strategic challenges include the risk of over-reliance on algorithmic outputs, the potential erosion of managerial autonomy, and the complexities of human-AI collaboration. Drawing on leading journals in strategic management and information systems, the article argues that while algorithmic systems enhance decision speed and accuracy, they also introduce governance dilemmas and require new accountability structures. In digitally transformed environments, firms must address how data-driven processes reshape managerial roles and strategic authority. The paper identifies organizational consequences, including shifts in power dynamics and the need for adaptive learning mechanisms. By examining these elements, it lays the foundation for a managerial framework that balances algorithmic efficiency with human strategic judgment, highlighting risks like bias and opportunities for enhanced competitive positioning. Effective governance of algorithm-supported decisions is essential for sustainable digital transformation. This perspective contributes to understanding how organizations can thrive when algorithms inform managerial judgment without diminishing the human element critical to strategic success.

Keywords Algorithmic management, Data-driven decision making, Managerial judgment, Human-AI collaboration, Digital transformation, Organizational governance

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Introduction

In an era defined by pervasive digital transformation, algorithms and artificial intelligence have become integral to managerial decision processes across industries [1, 2]. Managers no longer operate in isolation but interact with systems that process immense volumes of data to generate insights, predictions, and recommendations that directly inform strategic judgment [3-9]. This evolution marks a

departure from traditional intuition-driven management toward hybrid models in which algorithmic outputs shape human decision-making authority [4, 8, 10-14]. The phenomenon under study—when algorithms inform managerial judgment—carries profound organizational implications for firms navigating digitally transformed landscapes [1, 15-22].

The strategic value of big data and business analytics has been extensively documented, with frameworks emphasizing their role in creating competitive advantage through informed decision making [2, 12]. Realizing this value, however, hinges on how managers interpret and integrate these algorithmic insights into their judgment processes [15, 18]. Research underscores that digital transformation reconfigures managerial roles, demanding new competencies in collaborating with AI systems rather than merely overseeing them [23-25]. For instance, studies on organizational decision-making structures in the age of artificial intelligence highlight the emergence of hybrid human-AI models that alter traditional hierarchies and require managers to share authority with algorithmic systems [4].

Furthermore, the literature emphasizes the need for strategic direction in AI adoption, with chief information officers and boards of directors playing decisive roles in guiding organizational responses [1]. This involvement ensures that algorithmic systems align with broader firm objectives rather than operating in silos [5]. Datification, as a core aspect of digital strategy, forces organizations to reconsider how information systems support managerial judgment, moving beyond mere data collection to active strategic orchestration [3]. In parallel, the rise of corporate science in AI positions data as a strategic resource that managers must leverage judiciously to maintain competitive edges [5]. Additional insights from business-IT strategic alignment research show that governance structures moderate the impact of algorithmic tools on firm performance, underscoring the need for aligned oversight [13]. Multidisciplinary roadmaps connecting systems, data, and people reinforce the importance of integrated approaches in complex decision contexts that parallel managerial challenges [20]. Editor comments on next-generation digital platforms explicitly advocate for human-AI hybrids as the way forward, setting expectations for organizational evolution [21].

Yet, this integration is not seamless. Managerial judgment, historically rooted in experiential knowledge and contextual understanding, now confronts algorithmic precision that excels at pattern detection but may lack nuanced interpretation of business contexts [10, 24]. The literature on machine learning applications in management research suggests that algorithms can uncover strategic patterns invisible to human analysis. Yet this capability also introduces the risk that managers defer excessively to data outputs at the expense of holistic judgment [9]. Similarly,

work on the economics of IT and digitization raises critical questions about how firms must adapt their strategic processes to leverage these technologies effectively while preserving managerial discretion [17]. The unintended consequences of introducing AI systems further highlight potential pitfalls in the deployment of decision support systems that managers must anticipate [19].

Governance emerges as a critical theme throughout the literature. Boards and chief information officers must provide strategic direction for AI adoption to ensure alignment with organizational goals and mitigate risks associated with unchecked algorithmic influence [1, 5]. Without such oversight, algorithmic systems risk creating unintended organizational consequences, including shifts in control and accountability that affect overall firm performance [7, 19]. The complexity of digital business strategy further complicates matters, as firms grapple with configurational approaches to align data analytics with broader objectives in volatile environments [11, 22]. User interface design in algorithmic decision-making plays a vital role in facilitating or hindering human involvement, with consequences for overall organizational dynamics [26-29].

Moreover, human-AI collaboration in decision processes presents both opportunities and tensions. Cobots and AI assistants in knowledge work demand new forms of interaction, where managers learn to complement rather than compete with algorithmic recommendations to achieve superior outcomes [23]. Ethnographic insights into AI development for decision tasks reveal that expert involvement is essential yet fraught with challenges in validating algorithmic outputs and maintaining human oversight [24, 25]. These dynamics necessitate organizational learning mechanisms to build capabilities for effective data interpretation and iterative refinement of algorithmic models [6, 22]. Rising with machines through sociotechnical frameworks provides additional guidance on embedding AI without disrupting managerial judgment [28]. **Table 1** synthesizes the key conceptual foundations underpinning algorithm-informed managerial judgment, integrating insights from strategic management and information systems literature."

Table 1. Conceptual foundations of algorithm-informed managerial judgment in digitally transformed firms

Thematic domain	Core concept	Key insights from	Implications for management
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		literature	judgr	
Digital transformation and datification	Data as a strategic asset	Organizations increasingly rely on data infrastructures to inform strategic processes and create competitive advantage	Manage integrat driven i into str thinking than rely on inte	Organizational decision structures
Algorithmic decision support	Predictive analytics and AI systems	Algorithms enhance decision speed, pattern recognition, and forecasting capabilities	Manage from decision- to interpr algorit outp	Risks of algorithmic reliance
Human–AI hybrid decision models	Shared decision authority	Emergence of hybrid structures where human and algorithmic inputs jointly shape decisions	Manag judgr beco augme requi collabo with AI s	Over-dependence and bias
Managerial role transformation	New managerial competencies	Managers must develop skills in data interpretation, critical evaluation, and AI interaction	Judgr evolves contextua and ove rather th intuiti	Excessive reliance may erode intuition and embed biases from historical data
Governance and strategic alignment	Oversight of AI systems	Boards and CIOs play key roles in aligning algorithmic systems with organizational strategy	Manage operate govern framev ensu account and ethi	Human–AI collaboration dynamics
				Interaction challenges
				Effective collaboration requires trust, transparency, and user-friendly interfaces
				Organizational learning and adaptation
				Continuous capability development
				Firms develop learning mechanisms through iterative interaction with analytics systems
				Strategic implications
				Competitive advantage and positioning
				Firms leveraging AI effectively achieve superior decision quality and agility
				Manage align alg use with term str objec
This article adopts a purely conceptual managerial and strategic lens, avoiding empirical datasets or statistical models to focus on theoretical synthesis and the derivation of implications. The analysis focuses on how algorithmic systems influence managerial judgment and decision-making authority in digitally transformed firms.				

Strategic Challenge in Data-Driven Decision Making

The primary strategic challenge in data-driven decision making arises from the tension between algorithmic efficiency and the preservation of managerial judgment in digitally transformed firms. As predictive analytics become embedded in organizational processes, managers face increasing pressure to rely on algorithmic insights, potentially at the expense of their own interpretive authority [9, 15, 27]. Studies on machine learning for pattern discovery illustrate how algorithms can identify complex relationships in data, thereby enhancing strategic foresight. Yet, this capability simultaneously fosters a reliance that may erode traditional managerial skills in sense-making and contextual application [9]. Managers may begin to view algorithmic outputs as definitive, diminishing their capacity for intuitive leaps that have historically driven innovation in uncertain environments [27]. Implementing big data strategies from a managerial perspective further reveals that organizations often struggle to balance analytics-driven efficiency with the retention of human judgment [15].

This reliance is exacerbated in environments characterized by high data velocity and volume, where human judgment struggles to keep pace without algorithmic augmentation [2, 3, 12]. However, the challenge lies not in the technology itself but in integrating these systems into the organization. Research on algorithmic management highlights how control mechanisms shift when algorithms dictate not only operational work but also strategic decision flows, extending algorithmic influence into domains previously reserved for executive judgment [7]. In knowledge work settings, human-AI collaboration requires careful calibration; otherwise, managers risk becoming passive recipients of recommendations rather than active interpreters who inject strategic context and ethical considerations [14, 23]. The effects of business-IT alignment and IT governance on performance indicate that misalignment in algorithmic contexts can amplify these reliance issues [13].

A further dimension of the challenge is algorithmic influence on strategic judgment itself. Predictive models, while powerful in processing quantitative data, embed assumptions derived from historical patterns that may not fully capture evolving organizational realities or external disruptions [10, 24]. Insights from analyses of rational assumptions in algorithmic decision making underscore the dangers of treating machine outputs as infallible truths,

which can distort managerial intuition and lead to suboptimal strategic choices that overlook qualitative factors [10]. Moreover, the Janus-faced nature of AI feedback—between deploying systems and disclosing them to employees—creates additional dilemmas for managers when responding to algorithmic evaluations, potentially impacting team performance and long-term strategic alignment [18].

Governance of algorithm-supported processes has emerged as a core strategic hurdle for organizations. Designing ethical algorithms demands proactive managerial oversight to mitigate embedded biases and ensure transparency in decision pathways [16]. Without robust mechanisms, firms risk unintended consequences when introducing AI for decision support, including loss of accountability, reduced employee trust, and the propagation of systemic errors into core business strategies [19]. Ethnographic examinations of AI in high-stakes decisions, such as hiring, exemplify how expert managers must navigate the development phase carefully to prevent systems from inadvertently supplanting rather than supporting human expertise [25]. Connecting systems, data, and people through multidisciplinary approaches highlights additional governance layers needed for complex managerial decisions [20].

Organizational redesign around data-driven systems significantly compounds the strategic challenge. Decision structures must evolve to incorporate hybrid models that blend algorithmic precision with human oversight. Yet, this reconfiguration can disrupt established power dynamics, authority lines, and reporting relationships within the firm [4, 11]. The inherent complexity of digital business strategy in emerging environments requires firms to develop adaptive capabilities. Yet, the strategic challenge is to achieve a delicate balance between algorithmic optimization for efficiency and the retention of human creativity, which is essential for breakthrough strategies [22]. Occupational, industry, and geographic exposure to artificial intelligence varies widely, amplifying the challenge as managers in different roles confront unequal degrees of algorithmic integration that demand tailored adaptation strategies [26]. Next-generation platforms and editor insights stress that human-AI hybrids must be designed with these redesign challenges in mind [21].

Human-machine decision coordination introduces additional strategic complexities that span organizational layers. While collaboration promises enhanced outcomes

through complementary strengths, pitfalls arise when managers are integrated into AI decision loops without adequate training, user-friendly interfaces, or clear protocols for intervention [14, 28]. Sociotechnical frameworks for introducing AI into organizations emphasize the necessity of user involvement from the outset. Yet, the persistent challenge remains in maintaining managerial judgment and agency amid the rising tide of automation and predictive guidance [28]. Information and reform processes in knowledge management systems powered by big data add further layers of complexity to strategic decision-making, requiring managers to reformulate how they access and apply reformulated knowledge bases [6]. The role of user interfaces in supporting human involvement in algorithmic decisions further complicates coordination efforts [29].

Finally, the strategic consequences for firms operating in digital environments include the risk of competitive disadvantage if this challenge remains unaddressed. Organizations that fail to manage the interplay between algorithms and judgment risk algorithmic bias propagating unchecked into core strategies or managerial disengagement from the decision process altogether [16, 24]. Conversely, firms that proactively confront the challenge can leverage data-driven processes to achieve superior judgment and strategic positioning [1, 5, 8]. This detailed delineation of the multifaceted strategic challenge—spanning reliance, influence, governance, redesign, coordination, and competitive risks—sets the stage for a deeper examination of the resulting organizational consequences in the subsequent section. The synthesis drawn from the literature reveals that the core issue is not technological displacement of managers but the strategic imperative to manage hybrid decision authority effectively in algorithmically informed contexts.

The Evolution of Organizational Dynamics: Strategic Consequences of Integrating Algorithms into Managerial Judgment

The integration of algorithms into managerial judgment triggers significant organizational consequences that extend beyond individual decision-making processes, reshaping entire firm structures, power distributions, and strategic capabilities in digitally transformed organizations.

These changes manifest as reconfigurations of authority, control mechanisms, and learning processes, compelling managers and leaders to implement adaptive responses to maintain coherence and effectiveness [7, 11, 22].

One prominent consequence is the evolution of decision authority structures across the organization. As algorithmic systems increasingly inform judgment, traditional managerial power is redistributed, with data-driven insights gaining prominence in both operational and strategic deliberations [4, 18]. This redistribution can enhance overall organizational agility by enabling faster, more evidence-based decisions at multiple levels, but it also carries the risk of diluting human accountability if governance frameworks do not evolve in tandem [19, 16]. Empirical conceptualizations in the literature on organizational decision-making structures in the AI era document how hierarchies adapt to hybrid models, resulting in more networked and less rigidly vertical authority lines that facilitate cross-functional integration of algorithmic recommendations [4]. Business-IT alignment studies further illustrate how these authority shifts influence firm performance outcomes [13].

Another key ramification involves comprehensive organizational redesign around data-driven systems and processes. Firms are compelled to realign workflows, role definitions, and capability portfolios to fully accommodate algorithmic management, often leading to innovative forms of organizational control that seamlessly blend human strategic oversight with automated execution and monitoring [3, 7]. The organized complexity inherent in digital business strategy necessitates configurational adjustments across the enterprise, in which advanced analytics capabilities shift from supporting tools to central pillars of the organizational architecture [11]. As a direct result, managerial roles undergo profound evolution from autonomous decision-makers to skilled orchestrators of human-AI hybrid teams, necessitating updated training programs, collaborative protocols, and performance evaluation criteria that account for effective integration [23, 28].

Strategic adaptation constitutes a further critical consequence, as organizations must recalibrate their competitive positioning in response to algorithm-informed judgment. Analytics-driven strategies generate substantial value only when managerial judgment effectively synthesizes and contextualizes algorithmic recommendations, thereby fostering sustained innovation

and responsiveness in digitally mature firms [2, 12, 27]. However, inadequate adaptation can introduce strategic rigidities, leading to an overemphasis on algorithmic precision that inadvertently stifles the creative and intuitive elements of strategic thinking that differentiate market leaders [10, 24]. Broader examinations of the economics of information technology and digitization reveal firm-level implications, including shifts in performance metrics that increasingly tie success to the seamless integration of AI capabilities with human oversight [17]. Occupational exposure metrics provide a lens for understanding differential impacts across industries and geographies [26].

Governance mechanisms are indispensable organizational outcomes that demand immediate attention. The deployment of algorithm-supported decision processes necessitates the establishment of new oversight frameworks that address ethical considerations, bias mitigation, and transparency requirements [1, 16]. At the executive level, boards and senior leaders assume pivotal roles in providing directional guidance for these systems, ensuring their outputs remain aligned with long-term organizational strategy and values [1, 5]. Absent these adaptive governance structures, the organizational consequences can include widespread erosion of internal trust in decision systems, heightened exposure to external regulatory scrutiny, and potential reputational damage in data-intensive competitive arenas. Editor perspectives on digital platforms reinforce the urgency of governance in human-AI hybrid setups [21].

Organizational learning and capability development stand out as predominantly positive yet demanding consequences. Through sustained engagement with algorithmic insights, firms cultivate enhanced interpretive capacities that, over time, elevate collective judgment and decision quality [6, 22]. This developmental process, however, involves navigating persistent tensions in human-AI interactions, where managers must actively cultivate vigilance against phenomena such as automation complacency or over-deference to machine-generated outputs [14, 25]. Multidisciplinary connections between data and people further aid the development of these learning capabilities [20]. The role of user interfaces in decision support becomes crucial for facilitating effective learning loops [29].

In summary, integrating algorithms into managerial judgment fundamentally transforms organizational dynamics, requiring proactive strategic leadership. Firms

capable of addressing these ramifications through deliberate realignment of structures, governance, and capabilities are better positioned to fully capitalize on the advantages of data-driven processes while effectively mitigating associated downsides [8, 26]. This examination of evolving dynamics underscores the imperative for managerial intervention to steer the integration process toward outcomes that reinforce rather than undermine organizational coherence and strategic vitality in the digital age (Figure 1).

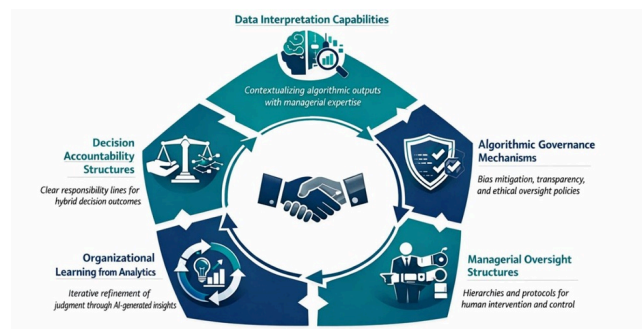


Figure 1. AI text description (Prompt used for generation above)

Navigating Hybrid Decision Authority: A Managerial Framework for Algorithm-Supported Processes

To equip organizations with actionable guidance amid the strategic challenges and organizational consequences previously examined, this article introduces the strategic human-algorithm integration framework (SHAIF). The framework synthesizes insights from the reviewed literature to provide a structured approach for managing algorithm-supported decision processes while preserving managerial judgment [8, 14, 16, 23, 28]. As shown in Figure 1, SHAIF is conceptualized as a dynamic five-component cycle with bidirectional linkages, ensuring that no single element operates in isolation. The components are deliberately interdependent: data interpretation feeds governance, oversight enables learning, accountability reinforces interpretation, and the entire cycle supports sustained strategic adaptation in digitally transformed firms.

The first component—data interpretation capabilities—centers on cultivating managerial skills to translate algorithmic outputs into contextually rich insights [9, 24, 27].

Rather than accepting predictive analytics at face value, managers must develop competencies in questioning assumptions, integrating tacit knowledge, and identifying when algorithmic patterns diverge from strategic realities. This capability directly counters the documented risks of over-reliance and serves as the foundation for all subsequent components.

The second component—algorithmic governance mechanisms—establishes policies and protocols for transparency, bias detection, and ethical deployment [16, 19]. Drawing on calls for ethical algorithm design, organizations implement regular audits, explainability requirements, and escalation pathways that prevent unchecked algorithmic influence from propagating into core strategic choices.

Third, managerial oversight structures redefine hierarchies and reporting lines to embed human intervention points within algorithmic workflows [4, 7, 25]. These structures include designated “algorithm stewards” at executive and functional levels, clear escalation thresholds, and hybrid review boards that ensure algorithmic recommendations remain subordinate to strategic judgment.

The fourth component—organizational learning from analytics—creates closed-loop mechanisms that enable firms to systematically refine both algorithms and managerial practices [6, 22]. Post-decision reviews, feedback captured from human-AI interactions, and iterative model retraining convert experience into collective capability, transforming potential pitfalls into sustained competitive advantage.

Finally, decision accountability structures clarify responsibility for hybrid outcomes, assigning ultimate accountability to human managers while documenting algorithmic contributions for traceability [1, 5, 29]. This component mitigates diffusion of accountability and supports regulatory compliance in increasingly scrutinized digital environments.

SHAIFF operates as a self-reinforcing cycle: stronger interpretation improves governance, robust governance enables safer oversight, and so forth. Firms adopting this framework move beyond reactive adaptation to proactive orchestration of human-algorithm synergy, aligning directly with the organizational redesign and governance imperatives identified earlier.

Practical Pathways to Hybrid Decision Excellence: Implementation Considerations and Governance Mechanisms

Translating SHAIFF into practice requires targeted capability building and risk management. Managers begin by conducting a SHAIFF maturity assessment across the five components, identifying gaps through structured workshops involving cross-functional teams and CIO leadership [1, 13]. Training programs focused on data interpretation—such as scenario-based simulations pairing managers with algorithmic outputs—build the foundational skills needed for effective human-AI collaboration [14, 23]. Governance mechanisms are operationalized through enterprise-wide AI ethics committees and automated monitoring dashboards that flag bias or drift in real time [16].

Figure 2 depicts the organizational impact of integrating algorithms into organizational processes.

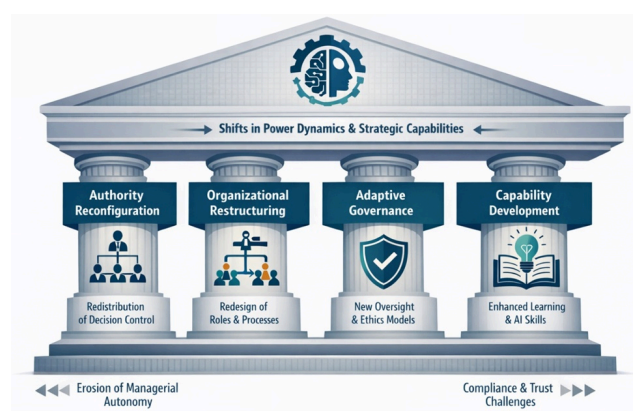


Figure 2. Organizational consequences of algorithmic integration.

Implementation must address key risks while capturing opportunities. Primary risks include automation complacency and loss of managerial intuition [10, 24], which can be countered by mandatory “human veto” protocols and periodic judgment calibration exercises. Opportunities emerge from accelerated decision-making and enhanced pattern recognition, enabling firms to respond more nimbly to market shifts [2, 12, 27]. Governance remains central: boards must provide strategic direction for algorithm adoption, ensuring alignment with long-term objectives and embedding accountability at every level [1, 5]. Practical rollout occurs in phases—pilot in one

strategic domain, evaluate using SHAIF metrics, then scale—minimizing disruption while demonstrating value.

Envisioning the digital horizon: Strategic outlook for algorithm-informed organizations. Organizations that master SHAIF will secure a durable competitive advantage in digitally saturated markets. As occupational exposure to AI intensifies across sectors [26], firms that institutionalize hybrid judgment will outperform those treating algorithms as mere tools. The outlook is optimistic yet conditional: success hinges on viewing algorithmic systems as strategic partners rather than replacements, fostering cultures that celebrate human oversight as a core differentiator [8, 28]. Future digital transformation initiatives must prioritize SHAIF components to navigate regulatory tightening around AI ethics and maintain stakeholder trust. Ultimately, the strategic trajectory favors organizations that evolve managerial judgment in tandem with technological capability, positioning them to lead rather than react in the next wave of digital disruption.

Conclusion

Sustaining Managerial Judgment in Algorithmic Landscapes When algorithms inform managerial judgment, digitally transformed firms confront both unprecedented opportunity and structural tension. By introducing the strategic human-algorithm integration framework (SHAIF) and detailing its implementation pathways, the analysis provides managers with a practical roadmap to balance efficiency gains with the preservation of strategic authority. The core message is clear: algorithmic systems enhance

rather than erode managerial judgment when deliberately integrated through structured capabilities, oversight, learning, and accountability. Firms that embrace this balanced approach will not only mitigate risks but also unlock sustained strategic advantage in an increasingly data-driven world. Future research should extend this conceptual foundation through longitudinal field studies. Yet the immediate managerial imperative remains: treat algorithms as informed advisors and safeguard the distinctly human capacity for contextual, ethical, and visionary decision-making that no system can replicate.

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