How Much Artificial Intelligence Does a Company Need? Organizational Cognitive Sovereignty and the Limits of AI Integration

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Extended Abstract

The rapid diffusion of artificial intelligence across organizational functions has progressively shifted managerial attention. The central question is no longer limited to whether companies should adopt AI, but now also concerns the extent to which they should integrate it into their activities. Existing research has primarily examined the determinants of AI adoption, organizational readiness, required technological capabilities, and the effects of AI on performance. Although these approaches are important, they often rest on the assumption that deeper AI integration generates greater organizational benefits, provided that the technology is properly implemented. This perspective nevertheless overlooks a more fundamental question: How much artificial intelligence does a company actually need? Beyond a certain threshold, additional reliance on AI may cease to strengthen organizational capabilities and begin to weaken the company's ability to interpret situations, formulate independent judgments, generate original solutions, preserve experience-based knowledge, and make decisions consistent with its values and identity.

This article develops a theoretical framework for identifying an organizationally appropriate level of artificial intelligence integration. It argues that AI use should not be assessed exclusively through technological intensity, automation rates, investment levels, or the number of applications deployed. Such indicators remain closely aligned with traditional approaches to industrialization and technology adoption because they primarily measure the quantity of technology introduced into organizational processes. Artificial intelligence, however, differs from many earlier technologies in one essential respect. It does not merely replace physical effort or the execution of repetitive tasks. It can intervene directly in functions traditionally associated with human and collective cognition, including problem formulation, information interpretation, alternative generation, option evaluation, decision-making, learning, and knowledge creation. Excessive dependence on AI may therefore transform not only the structure of work but also the organization's capacity to think through its members.

To capture this specificity, the article introduces the concept of AI Cognitive Penetration. This construct refers to the extent to which AI participates in the cognitive functions through which an organization interprets its environment, evaluates available options, generates ideas, makes decisions, and learns from experience. It also captures the degree of influence or control exercised by AI over these functions. AI Cognitive Penetration therefore differs from general technology adoption because it considers the cognitive and strategic importance of the activities delegated to intelligent systems.

Using AI to correct linguistic errors, classify documents, or automate routine administrative tasks represents a relatively low level of cognitive penetration. By contrast, using AI to formulate strategy, select employees, evaluate performance, diagnose organizational problems, or determine resource allocation reflects a much deeper level of cognitive penetration. Two companies may consequently use a comparable number of AI tools while displaying substantially different levels of cognitive penetration.

The difference depends not only on the number of technologies used but, more importantly, on the nature of the activities in which AI intervenes and the degree of influence it exercises over organizational judgment.

The theoretical framework subsequently introduces Organizational Cognitive Sovereignty as the principal organizational capacity potentially threatened by excessive AI use. Organizational Cognitive Sovereignty refers to an organization's retained capacity to interpret situations, formulate its own judgments, generate original responses, make value-sensitive decisions, and learn from experience without becoming cognitively dependent on artificial intelligence. This concept implies neither the rejection of technology nor complete independence from algorithmic systems. Rather, it refers to the organization's capacity to remain the author of its judgments while using AI as a resource for cognitive augmentation.

Organizational Cognitive Sovereignty provides a more precise expression of what may be described as the mind of the organization, namely the organization's distinctive capacity to think, understand, judge, and act on the basis of its collective experience, culture, values, and interactions among members. This dimension represents the organization's distinctive human contribution. It is not reducible to the sum of individual intelligences but reflects the particular way in which the organization constructs a shared understanding of its environment. It is manifested through its patterns of reflection, collective memory, tacit knowledge, problem-solving practices, and ability to make sense of ambiguous situations.

Organizational Cognitive Sovereignty comprises several interdependent capabilities. First, the organization retains meaningful human judgment rather than reducing employees to formal validators of AI-generated outputs. Second, organizational members remain capable of interpreting problems before consulting algorithmic recommendations. Third, strategically important knowledge remains understood and controlled within the organization instead of being entirely externalized to technological systems. Fourth, employees continue to develop their competencies through practice, reflection, error correction, and collective interaction. Finally, organizational decisions remain connected to the company's history, values, identity, and tacit understanding of its environment.

The article's central argument is that AI integration simultaneously produces benefits and potential losses. On the one hand, AI can improve efficiency, information-processing speed, analytical capacity, process consistency, the quality of certain decisions, and access to knowledge. On the other hand, increasing cognitive penetration may gradually produce technological dependence, human deskilling, excessive reliance on algorithmic recommendations, erosion of tacit knowledge, reduced critical reflection, and weakened collective sensemaking.

The appropriate level of AI use therefore results from a balance between the benefits generated by the technology and the cognitive losses it may produce. During the initial stages of integration, the benefits may be substantial because AI reduces repetitive work, expands information-processing capacity, and supports decision-making. However, these benefits do not necessarily continue to increase at the same rate as AI use intensifies. At the same time, cognitive losses may remain limited as long as the technology supports human judgment, but may accelerate when AI begins to replace processes of interpretation, learning, and decision-making.

The article therefore argues for the existence of an optimal AI integration threshold that is specific to each organization. Below this threshold, the use of artificial intelligence generates greater organizational benefits than cognitive and organizational costs. Near the threshold, the company reaches a state of complementarity in which AI strengthens organizational capabilities without undermining cognitive autonomy. Beyond this threshold, each additional use of AI risks producing cognitive losses that exceed the benefits obtained. This threshold is not universal. It depends on task characteristics, employee competencies, the quality of governance mechanisms, decision complexity, the degree of human–AI complementarity, and the importance of tacit knowledge in organizational functioning.

On this basis, the article proposes a four-level model of organizational AI integration. At the basic level, AI is used for simple, routine, and peripheral activities with limited cognitive importance. It primarily accelerates execution, reduces administrative workload, and facilitates access to selected information. At this stage, its influence over core organizational decisions remains limited.

At the essential level, artificial intelligence becomes necessary for the functioning of selected activities. It supports employees in information processing, data analysis, decision preparation, and operational coordination. Organizational members nevertheless retain the capacity to interpret outputs, contextualize them, and make the final decision. AI therefore plays a supportive role without becoming the primary source of organizational judgment.

At the advanced level, the organization achieves productive complementarity between human and artificial intelligence. AI participates in cognitively and strategically important activities, while employees continue to interpret, challenge, and contextualize the outputs produced. They also retain responsibility for the decisions made. The advanced level therefore does not correspond to the maximum possible use of artificial intelligence. Instead, it refers to a mature form of integration in which AI augments organizational capabilities without replacing human and collective reflection.

The fourth level corresponds to excessive cognitive dependence. At this stage, AI Cognitive Penetration exceeds the organization's capacity to preserve its Cognitive Sovereignty. Employees progressively lose opportunities to exercise judgment, develop expertise, construct shared interpretations, and learn directly from experience. The organization may continue to benefit from greater speed, stronger procedural consistency, or a larger volume of outputs. At the same time, however, it becomes increasingly dependent on systems that its members no longer fully understand and may no longer be able to evaluate critically.

The transition from the advanced level to the excessive level is therefore not determined by the absolute quantity of AI used. It occurs when artificial intelligence ceases to extend organizational cognition and begins to substitute for it. An advanced company may use AI intensively while maintaining high levels of human judgment, critical reflection, and collective learning. Conversely, a company may experience excessive cognitive dependence even when using only a limited number of tools, particularly when those tools control essential decision-making functions.

The proposed theoretical framework therefore considers AI Cognitive Penetration to have a positive effect on operational efficiency, while maintaining a nonlinear relationship with Organizational Cognitive Sovereignty. At low and moderate levels, AI may strengthen organizational cognition by increasing analytical capacity and freeing employees from unnecessary cognitive burdens. At high levels, however, it may weaken independent sensemaking, the retention of judgment, experiential learning, and organizational control over knowledge. Organizational Cognitive Sovereignty consequently plays a central role in the relationship between AI integration and sustainable performance.

The model leads to several theoretical propositions. First, increasing AI Cognitive Penetration improves operational efficiency up to a certain level. Second, the effect of cognitive penetration on Organizational Cognitive Sovereignty varies according to its intensity. Moderate use may support cognitive sovereignty, whereas excessive use may weaken it. Third, preserving Organizational Cognitive Sovereignty improves sustainable performance because it enables the organization to continue learning, adapting, and producing decisions consistent with its identity. Fourth, Cognitive Sovereignty partly explains why AI integration may generate positive outcomes at certain levels and negative outcomes at others. Finally, strong human–AI complementarity enables the organization to sustain deeper technological integration without becoming cognitively dependent.

From an empirical perspective, AI Cognitive Penetration could be measured by assessing the importance of the activities delegated to AI, the level of autonomy granted to intelligent systems, the frequency with which algorithmic recommendations determine final decisions, and employees' ability to perform the

same activities without algorithmic assistance. Organizational Cognitive Sovereignty could be assessed through the retention of human judgment, the ability to challenge AI recommendations, internal control over knowledge, experiential learning, and the integration of organizational values into decision-making. The analysis could then identify the point at which increasing AI use ceases to strengthen performance and begins to diminish the organization's cognitive capacities.

This article makes three principal contributions to the literature. First, it moves beyond the dominant question of technology adoption by examining the appropriate level of organizational AI use. Second, it distinguishes AI integration from conventional industrialization by emphasizing the penetration of cognitive functions rather than the mere automation of physical or procedural activities. Third, it introduces Organizational Cognitive Sovereignty as a capability that enables companies to benefit from AI while preserving their distinctive human judgment, organizational memory, tacit knowledge, and capacity to make decisions grounded in their own values.

The proposed framework also carries an important managerial implication. The organization that uses artificial intelligence most intensively is not necessarily the most advanced. A genuinely advanced organization is one that can use AI extensively while remaining capable of thinking, learning, and deciding through its members. The managerial objective should therefore not be to maximize artificial intelligence use but to identify an AI adequacy frontier. This frontier refers to the level at which the benefits of technology remain compatible with the preservation of Organizational Cognitive Sovereignty. Beyond this limit, AI no longer functions solely as a tool of organizational augmentation. It progressively becomes a source of dependence capable of weakening the mind of the organization, understood as the organization's distinctive and collective capacity to understand, judge, create, and act.

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