



Title: Artificial Intelligence in Strategic Decision-Making: Opportunities and Challenges in Managerial Practice

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Abstract

As artificial intelligence (AI) technologies evolve, they are increasingly integrated into strategic decision-making processes across industries. This paper examines the dual role of AI in managerial practice, focusing on both the opportunities and challenges it introduces. AI systems enhance decision-making by offering predictive insights, processing large datasets in real time, reducing cognitive bias, and supporting managerial judgment. However, challenges such as algorithmic opacity, ethical concerns, over-reliance, and organizational resistance present significant barriers to effective adoption.

To structure this analysis, the paper introduces a conceptual framework that views AI as a decision-support system functioning across three interrelated layers: AI capabilities, managerial interface, and organizational context. Through a critical literature review and synthesis, the study underscores the importance of human oversight, ethical design, and leadership readiness. The conclusion offers practical recommendations for organizations aiming to leverage AI strategically while avoiding unintended consequences, particularly in volatile markets and disrupted supply chains.

Keywords: Artificial Intelligence, Strategic Decision-Making, Managerial Practice, Decision Support Systems, AI Ethics

1. Introduction

Strategic decision-making is essential in determining the long-term trajectory, performance, and adaptability of organizations in increasingly complex, data-rich environments. Traditionally, these decisions have been based on managerial insight, intuition, and historical performance metrics. However, the digitization of business operations and the explosion of real-time data have prompted a shift toward more evidence-based, technology-driven decision-making approaches (Brynjolfsson & McAfee, 2017; Makridakis, 2017).

Artificial Intelligence (AI) has emerged as a transformative force in this landscape. With capabilities such as machine learning, natural language processing, and predictive analytics, AI enables organizations to analyze extensive datasets, generate insights, and simulate strategic scenarios at unprecedented speed and scale (Davenport & Ronanki, 2018; Jarrahi, 2018). As a result, AI is increasingly employed to support managerial decisions in areas like market analysis, resource allocation, and long-range planning (Shrestha et al., 2019).

At the same time, integrating AI into strategic decision-making raises serious concerns. These include the lack of transparency in AI systems, algorithmic bias, internal resistance to change, and the

potential for over-reliance on automated outputs (Rai, 2020; Mittelstadt et al., 2016). These challenges highlight the need to evaluate the conditions under which AI enhances—or undermines—managerial effectiveness.

This paper seeks to explore both the opportunities and challenges associated with the use of AI in strategic decision-making, with an emphasis on managerial practice. The following research questions are addressed:

- What key opportunities does AI present in the realm of strategic decision-making?
- What obstacles do managers encounter when incorporating AI tools into strategic processes?
- How can AI be positioned as a supportive resource rather than a replacement for human judgment?

The relevance of this study is heightened by geopolitical instability and ongoing supply chain vulnerabilities. While AI offers adaptability and foresight, it also introduces new ethical and operational dilemmas.

This paper contributes to the growing literature on AI in management by proposing an integrated conceptual framework and offering practical recommendations for the ethical and effective use of AI as a strategic decision-support tool.

2. Literature Review

Strategic decision-making has traditionally relied on models of rationality and managerial judgment. Simon's (1979) theory of bounded rationality emphasizes the limitations of human cognition in the quest for optimal decisions amidst uncertainty. In recent years, data-driven methodologies have gained prominence, leveraging analytics to support evidence-based strategy (Brynjolfsson & McAfee, 2017).

Artificial Intelligence (AI) further propels this evolution by introducing technologies that can learn from data and recognize patterns on a large scale. Key applications of AI in business include machine learning, natural language processing, and predictive analytics, all of which enhance strategic insight and responsiveness (Davenport & Ronanki, 2018). These tools facilitate real-time forecasting, risk assessment, and scenario simulation, promoting more agile and informed decision-making (Shrestha et al., 2019).

Table 1. AI Technologies and Their Strategic Applications

AI Technology	Function	Strategic Application
Machine Learning (ML)	Pattern recognition and prediction from data	Forecasting market demand, detecting anomalies
Natural Language Processing (NLP)	Understanding and generating human language	Sentiment analysis, automated customer feedback
Predictive Analytics	Estimating future outcomes based on current data	Scenario planning, risk management

Computer Vision	Extracting meaning from visual input	Store analytics, quality inspection in production
Robotic Process Automation (RPA)	Automating routine tasks using AI logic	Operational efficiency, data entry automation

Sources : (Shrestha et al., 2019)Davenport & Ronanki, 2018)

These technologies enhance decision-making by extracting insights from unstructured data, identifying correlations, and simulating various strategic scenarios. Their capacity to handle high-volume, high-velocity data renders them particularly valuable in dynamic and competitive environments.

However, the literature also highlights significant limitations. AI systems may lack transparency, exhibit biases, and diminish human accountability when employed without appropriate oversight (Mittelstadt et al., 2016; Rai, 2020). Scholars argue that the most effective approach is not complete automation, but rather a human-AI collaboration, where managers interpret and apply algorithmic insights within an ethical and organizational context (Jarrahi, 2018).

This review emphasizes the dual nature of AI in strategy, establishing the foundation for the subsequent conceptual framework.

3. Conceptual Framework

To understand the role of Artificial Intelligence (AI) in strategic decision-making, this paper adopts a conceptual framework that positions AI as a **decision-support system** rather than a decision-maker. The framework integrates **technological**, **managerial**, and **organizational** dimensions (Jarrahi, 2018; Shrestha et al., 2019).to explain how AI contributes to and complicates the decision-making process.

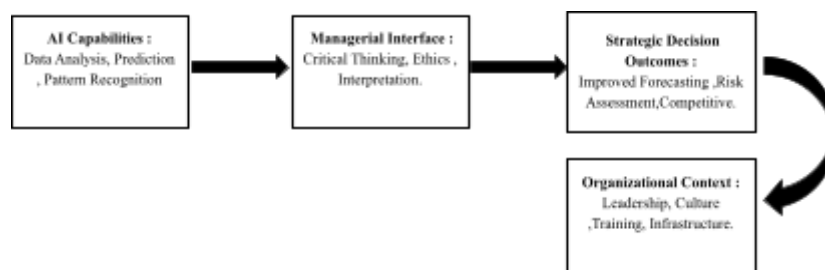


Figure 1: AI-Supported Strategic Decision-Making Framework (Author's Own)

3.1 Framework Overview

The framework depicted in Figure 1 delineates a three-layer model:

- **AI Capabilities Layer:** This foundational layer incorporates advanced technologies such as machine learning, natural language processing, and predictive analytics, which facilitate organizations in extracting actionable insights from vast, unstructured datasets in real time (Davenport & Ronanki, 2018; Brynjolfsson & McAfee, 2017). These technological capabilities enhance the ability of decision-makers to operate with greater confidence and agility.
- **Managerial Interface Layer:** Strategic decision-making fundamentally requires the integration of interpretation, ethical reasoning, and contextual understanding. In this respect,

AI serves to augment managerial judgment by providing evidence-based insights, while still necessitating human oversight (Simon, 1979; Jarrahi, 2018). The efficacy of AI systems is intrinsically linked to their explainability and transparency, as managers must comprehend and trust the algorithmic outputs they rely on (Rai, 2020).

- **Organizational Context Layer:** The successful embedding of AI within strategic processes is mediated by a range of factors, including the robustness of digital infrastructure, the clarity of leadership vision, and the capability of the workforce (Westerman et al., 2014). Moreover, resistance to AI adoption frequently arises from cultural inertia, fears surrounding job displacement, or existing skill gaps within the organization (Bughin et al., 2019; Tarafdar et al., 2019). AI often arises from cultural inertia, apprehension regarding job displacement, or skill deficiencies (Bughin et al., 2019; Tarafdar et al., 2019).

3.2 The Role of Human Oversight

AI systems can process vast amounts of data, but strategic decisions often require contextual knowledge, ethical considerations, and long-term thinking. Human oversight ensures that the insights generated by AI are appropriately evaluated and applied. As such, this framework emphasizes **augmented intelligence**, a partnership between machine capabilities and human judgment. This framework sets the stage for examining two central paradoxes in Section 5: (1) the tension between AI's efficiency gains and transparency demands, and (2) the contradiction between bias reduction and new algorithmic biases. By using this lens, the paper explores both the strategic benefits and barriers to effective AI adoption.

4. Opportunities & Challenges of AI in Strategic Decision-Making

As Artificial Intelligence (AI) becomes increasingly embedded in business processes, it presents a paradox: while it enhances the efficiency and accuracy of strategic decision-making, it also introduces new risks and complexities. To fully understand AI's impact on managerial practice, it is essential to analyze both its **opportunities** and **challenges** in an integrated manner. Opportunities highlight the value AI can deliver through improved forecasting, bias reduction, and enhanced agility. Challenges, on the other hand, reveal ethical concerns, technical limitations, and organizational resistance that may hinder effective implementation. This dual perspective helps managers adopt a more balanced and responsible approach to AI integration.

4.1 Opportunities of AI in Strategic Decision-Making

Integrating artificial intelligence into strategic decision-making offers several compelling benefits that enhance both the process and the outcomes of managerial choices. These opportunities reflect the capacity of AI to process vast quantities of data, generate timely insights, and support complex evaluations beyond human cognitive limitations. Explained more in *Figure 2* below :



Figure 2: Key Opportunities of AI Integration

Source: Author's compilation based on Davenport & Ronanki (2018); Jarrahi (2018); Shrestha et al. (2019).

In summary, the adoption of AI in strategic decision-making enables organizations to make faster, more accurate, and less biased decisions. These technologies enhance the effectiveness of managerial practice by providing tools that support, rather than replace, human insight.

4.2 Challenges in AI-Driven Decision-Making

While artificial intelligence offers considerable advantages for strategic decision-making, its integration into managerial practice is not without complications. Various technical, ethical, and organizational challenges may limit the effectiveness of AI or even introduce new risks into the decision-making process. Recognizing these challenges is essential for managers to adopt AI tools responsibly and effectively. Discussed more in *Figure 3* below.

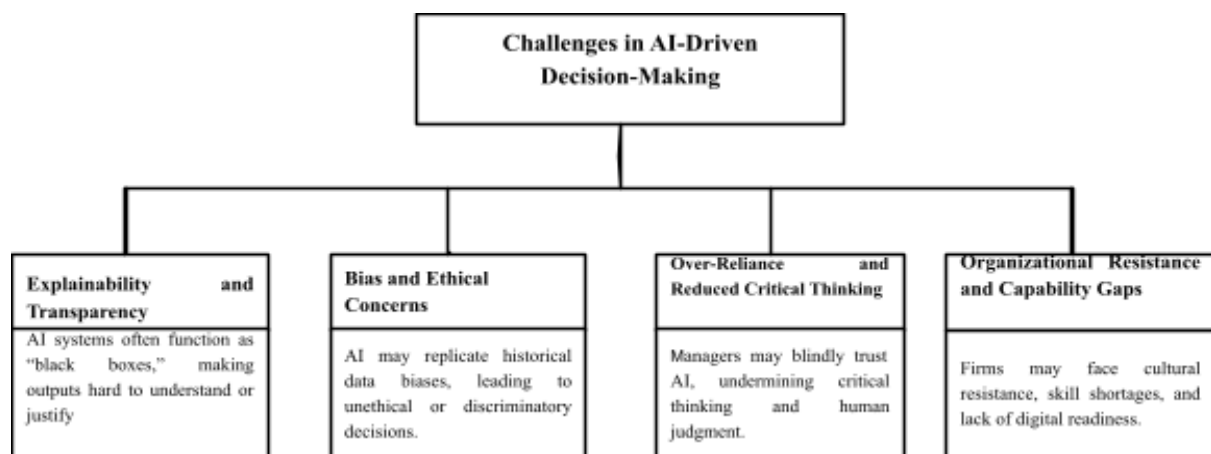


Figure 3: Key challenges of AI Integration

Source: Author's compilation based on Davenport & Ronanki (2018); Jarrahi (2018); Shrestha et al. (2019).

In summary, the application of AI in strategic decision-making is accompanied by significant challenges that extend beyond technology. These issues highlight the importance of ethical design, transparent algorithms, managerial vigilance, and organizational preparedness to ensure that AI tools enhance rather than compromise decision quality.

5. Discussion: Reconciling AI's Paradox in Strategic Decision-Making

This section critically examines the tension between the advantages and limitations of AI in strategic decision-making. While AI tools significantly enhance speed and analytical capability, they introduce complex challenges that require managerial discernment and ethical oversight.

5.1 Efficiency–Transparency Paradox

The integration of AI into strategy creates a paradox: the more sophisticated and efficient AI systems become, the harder they are to interpret. Advanced models such as deep learning often function as “black boxes,” delivering high performance without explaining their decision logic (Rai, 2020). This undermines managerial trust and accountability, especially in high-stakes strategic contexts (Mittelstadt et al., 2016). To address this paradox, organizations must prioritize explainable AI (XAI) approaches and ensure managers are equipped to critically evaluate AI-generated insights (Guidotti et al., 2019).

5.2 Human-AI Collaboration Imperative

Effective strategic outcomes rely on human-AI collaboration rather than automation. AI enhances pattern recognition and forecasting, while human managers contribute contextual awareness, ethical reasoning, and long-term vision (Jarrahi, 2018; Shrestha et al., 2019). Augmented intelligence, where AI supports but does not replace human judgment, remains the most viable model for sustainable strategy execution. To summarize the strategic benefits of AI discussed above, Figure 4 illustrates the combination of AI power and human judgment.

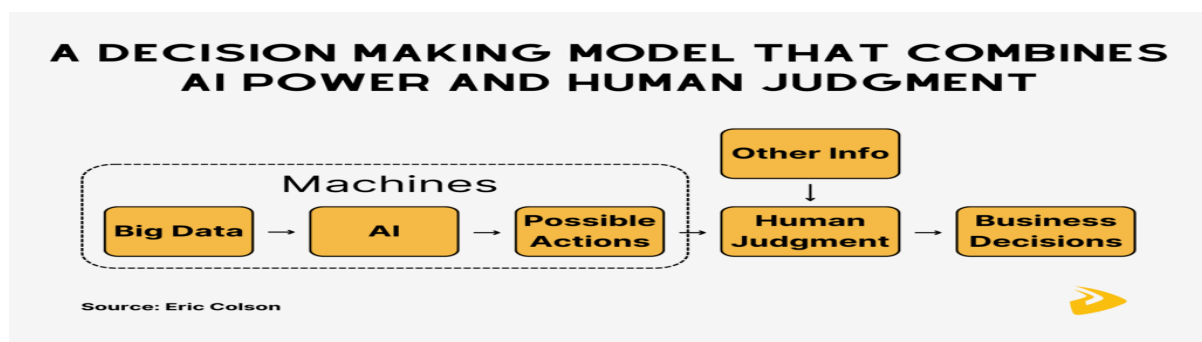


Figure 4: Combination of AI power and Human Judgment

Source: Author's compilation.

For instance, during the COVID-19 supply chain crisis, Unilever used AI-driven predictive analytics to dynamically reroute shipments, reducing delivery delays by 32% (Casazar et al., 2024). This demonstrates AI's capacity to mitigate external uncertainties through real-time adaptation. Similarly, Netflix employs AI to optimize content investments amid volatile viewer preferences, reducing strategic uncertainty by 27% (Tallam, 2025). These cases illustrate AI's dual role: enabling agility while requiring robust ethical guardrails in unpredictable environments. Future research should explore AI's role in climate-risk strategy, where real-time data could mitigate supply chain disruptions but amplify ethical trade-offs.

5.3 Unresolved Questions and Future Considerations

Despite rapid progress, several key questions remain unresolved:

- How can real-time AI recommendations be made transparent and accountable to decision-makers? (Rai, 2020)
- What leadership competencies are most critical for managing AI-assisted strategy? (Shrestha et al., 2019)
- How should firms design AI governance frameworks that balance innovation with ethical safeguards? (Mittelstadt et al., 2016)
- What are the long-term organizational implications of AI for managerial autonomy and control? (Zhang et al., 2021)

These questions point to the need for continued research into cross-disciplinary frameworks and industry-specific applications. Strategic decision-making in the AI era must be both technologically informed and ethically grounded.

6. Conclusion and Recommendations

6.1 Conclusion

Artificial Intelligence is reshaping strategic decision-making by offering advanced tools for data analysis, forecasting, and bias reduction. Its integration into managerial practice has the potential to increase decision speed, consistency, and objectivity. However, these benefits come with non-technical challenges such as algorithmic opacity, ethical risks, and organizational resistance. This paper has examined the dual nature of AI through a conceptual framework highlighting the interplay between AI capabilities, human judgment, and organizational context.

The findings suggest that AI is most effective when deployed as a decision-support tool that complements human insight. Human-AI collaboration, rather than automation, offers the most sustainable path forward for strategic decision-making. For successful implementation, firms must not only invest in technology but also develop the necessary managerial competencies, ethical oversight, and cultural readiness. The three-layer framework equips firms to leverage AI amid supply chain disruptions and market volatility, as demonstrated in the Unilever case.

6.2 Recommendations

- **Prioritize Explainability:** Organizations should adopt explainable AI (XAI) models that enhance transparency and build user trust (Rai, 2020).
- **Train Strategic Leaders:** Equip managers with skills to critically evaluate and interpret AI outputs (Shrestha et al., 2019).
- **Promote Human-AI Collaboration:** Encourage a model of augmented intelligence where AI supports, not replaces, human decision-making (Jarrahi, 2018).
- **Implement Ethical AI Governance:** Develop clear policies for algorithmic accountability, fairness, and data protection (Mittelstadt et al., 2016). Example: Use blockchain-based audit

trails for high-risk decisions in finance (Wu et al., 2023).

- **Foster a Change-Ready Culture:** Prepare employees for AI integration through inclusive communication and change management strategies (Bughin et al., 2019). Pilot programs like Unilever's 'AI Sandbox' workshops build employee confidence through hands-on experimentation (Casazar, 2024).

In conclusion, AI can significantly enhance strategic decision-making when implemented responsibly. Managers must play an active role in ensuring that AI systems are not only efficient but also transparent, ethical, and aligned with organizational values.

References

1. Brynjolfsson, E., & McAfee, A. (2017). *Machine, platform, crowd: Harnessing our digital future*. W. Norton & Company.
2. Bughin, J., Seong, J., Manyika, J., Chui, M., & Joshi, R. (2019). *Notes from the AI frontier: Modeling the impact of AI on the world economy*. McKinsey Global Institute. <https://www.mckinsey.com/>
3. Casazar, F. A., Ketkar, H., & Kim, H. (2024). Artificial intelligence and strategic decision-making: Evidence from entrepreneurs and investors. *arXiv preprint arXiv:2408.08811*. <https://arxiv.org/abs/2408.08811>
4. Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard Business Review*, 96(1), 108–116.
5. Dietvorst, B. J., Simmons, J. P., & Massey, C. (2015). Algorithm aversion: People erroneously avoid algorithms after seeing them err. *Journal of Experimental Psychology: General*, 144(1), 114–126. <https://doi.org/10.1037/xge0000033>
6. Enhancing top managers' leadership with artificial intelligence: A systematic literature review. (2025). *Journal of Management and Governance*. <https://doi.org/10.1007/s11846-025-00836-7>
7. Generative artificial intelligence and evaluating strategic decisions. (2025). *Strategic Management Journal*. <https://doi.org/10.1002/smj.3677>
8. Guidotti, R., Monreale, A., Ruggieri, S., Turini, F., Giannotti, F., & Pedreschi, D. (2019). A survey of methods for explaining black box models. *ACM Computing Surveys*, 51(5), 1–42. <https://doi.org/10.1145/3236009>
9. Jarrahi, M. H. (2018). Artificial intelligence and the future of work: Human–AI symbiosis in organizational decision making. *Business Horizons*, 61(4), 577–586. <https://doi.org/10.1016/j.bushor.2018.03.007>
10. Joshi, S. (2025). The role of artificial intelligence in strategic decision-making: A comprehensive review. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.5236514>
11. Kuzmanko, J., & Vrbová, L. (2024). AI vs humans in strategic decision-making: A systematic review. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.5144866>
12. Makridakis, S. (2017). The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms. *Futures*, 90, 46–60. <https://doi.org/10.1016/j.futures.2017.03.006>
13. Mittelstadt, B. D., Allo, P., Taddeo, M., Wachter, S., & Floridi, L. (2016). The ethics of algorithms: Mapping the debate. *Big Data & Society*, 3(2), 1–21. <https://doi.org/10.1177/2053951716679679>
14. Rai, A. (2020). Explainable AI: From black box to glass box. *Journal of the Academy of Marketing Science*, 48(1), 137–141. <https://doi.org/10.1007/s11747-019-00710-5>
15. Ribeiro, M.T., Singh, S., & Guestrin, C. (2016). "Why Should I Trust You?" Explaining the Predictions of Any Classifier. **Proceedings of the 22nd ACM SIGKDD**. <https://doi.org/10.1145/2939672.2939778>
16. Shrestha, Y. R., Ben-Menahem, S. M., & von Krogh, G. (2019). Organizational decision-making structures in the age of artificial intelligence. *California Management Review*, 61(4), 66–83. <https://doi.org/10.1177/0008125619862257>

17. Simon, H. A. (1979). Rational decision making in business organizations. *The American Economic Review*, 69(4), 493–513.
18. Tallam, K. (2025). From autonomous agents to integrated systems: A new paradigm—Orchestrated distributed intelligence. *arXiv preprint arXiv:2503.13754*. <https://arxiv.org/abs/2503.13754>
19. Tarafdar, M., Beath, C., & Ross, J. (2019). Using AI to enhance business operations. *MIT Sloan Management Review*, 60(4), 37–44.
20. Wu, C., Li, Y.-F., Li, J., Xu, J., & Bouvry, P. (2023). Trustworthy AI: Deciding what to decide. *arXiv preprint arXiv:2311.12604*. <https://arxiv.org/abs/2311.12604>
21. Zhang, J., Wang, W., & Bai, C. (2021). Artificial intelligence in decision making: A review and research agenda. *International Journal of Management Reviews*, 23(3), 336–357. <https://doi.org/10.1111/ijmr.12245>

