



AI-Driven Procurement: Managing Bias, Risk and Ethical Accountability

Introduction

One of the most important tasks in large-scale organizations that rely heavily on stock and inventory is identifying suitable suppliers and vendors (Sarkar, Solanki and Gaikwad, 2025). Supplier assessment has traditionally been time-consuming and resource-intensive, while international sourcing further increases costs and associated risks. AI-enabled procurement is increasingly being viewed as a means of addressing these challenges by reducing the time and resources required for procurement activities.

Like other technology-driven solutions, AI-enabled procurement promises cost savings and improved efficiency. It can streamline vendor selection, automate routine tasks and enable procurement specialists to devote greater attention to strategic organizational objectives. The economies of scale offered by AI-enabled procurement can be substantial compared with traditional procurement approaches (Shaik, 2026). However, beyond the efficiency gains associated with technological implementation, several important considerations require the attention of management accountants.

The Main Issue With AI Procurement Decision Making

AI used in procurement relies heavily on historical organisational data to identify relationships between variables and generate recommendations (Ho, 2025). However, the historical data used by AI systems may itself contain subjective human decisions and biases. Procurement specialists have traditionally made decisions based on their experience, judgement and the information available to them at the time. Consequently, historical procurement data may reflect preferences, assumptions and decision-making patterns that are not necessarily objective.

This creates an important challenge. If historical data contains bias, machine-learning systems trained on that data may reproduce and reinforce those biases. The resulting decisions may therefore appear objective because they are generated mathematically, even though the underlying data reflects earlier human judgements (Lo Ribeiro et al., 2026).

The validation of subjective historical data through mathematical processes may initially appear objective and harmless, but it has significant ethical implications for procurement decision-making. A major objective of adopting AI procurement tools is to process large volumes of relevant data within a limited timeframe (Akhtar, 2025). From a financial perspective, this can be highly attractive because it may reduce procurement costs while saving specialists considerable time and resources.

AI can also rapidly identify suppliers based on predefined criteria and provide recommendations regarding supplier reliability, financial strength and value. However, the speed and apparent objectivity of these recommendations should not eliminate the need for professional judgement and independent validation.

Ethics and AI procurement

AI systems are not immune to technical limitations. Users with experience of AI models are familiar with issues such as hallucinations, inaccurate outputs and the misidentification of patterns (Arts, 2025). In procurement, an algorithm may misinterpret changing customs information, incorrectly group unrelated corporate entities or generate inaccurate financial viability scores for a financially distressed supplier. If finance teams treat AI-generated outputs as authoritative without appropriate validation, organizations may assume operational, credit and legal risks that have not been adequately assessed.

A closer examination of AI-based procurement also highlights the influence of historical data. AI models built using enterprise systems such as ERP platforms do not operate independently of the organisational environment. Instead, they analyze historical enterprise data that reflects years of human decisions.



These records may contain previous managerial heuristics, informal rules of thumb, subjective supplier scores, legacy buyer preferences and institutional approaches to risk (Clarkson, 2026).

For example, if previous procurement managers preferred local suppliers but were consistently reluctant to engage with smaller vendors, historical procurement records may establish an apparent statistical relationship between supplier characteristics and lower perceived delivery risk. Similarly, if previous buyers consistently undervalued smaller innovative suppliers or penalized alternative vendors for reasons unrelated to their actual performance, these patterns may subsequently be interpreted by AI systems as valid historical indicators.

As a result, an AI model used for supplier selection does not necessarily remove human bias. Instead, it may encode, automate and scale that bias under the appearance of mathematical objectivity. The impersonal nature of an algorithm can therefore reinforce historical assumptions and decision-making patterns (Theodorakopoulos et al., 2025).

This creates an important dilemma for organizations adopting AI for strategic decision-making: automated historical pattern recognition should not be confused with genuine strategic reasoning. AI can identify correlations in historical data, but human professionals remain responsible for determining whether those correlations are relevant, ethical and appropriate for future decisions.

Large-scale global procurement strategies that use algorithmic supplier screening may also create challenges for small and medium enterprises (SMEs), minority-owned business enterprises (MBEs), women-owned businesses and suppliers from developing countries (Muldoon et al., 2025). AI models are generally designed to optimize organizational objectives based on available data. In such circumstances, smaller suppliers with limited historical records or complex digital compliance profiles may be disadvantaged during automated supplier evaluation (Rainy and Chowdhury, 2022).

Emerging suppliers may offer significant local economic benefits, innovative products or lower-carbon solutions but may nevertheless be excluded during pre-qualification because they do not have the volume or depth of historical data required by an algorithm. Over time, such exclusions may become embedded in the system's evaluation history and create structural barriers to market entry for SMEs and other underrepresented suppliers. This may conflict with organizations' corporate social responsibility (CSR) commitments.

Ethical purchasing also involves procedural justice, which requires suppliers to be assessed according to transparent, consistent and contestable standards. Data science-powered procurement algorithms may challenge this principle if suppliers have limited opportunities to understand, question or challenge the basis of an automated decision (Pal, 2026). When suppliers are excluded based on inaccurate or biased information, they may have little opportunity to explain the circumstances or correct the underlying data.

Although the bias may originate from human decisions, the use of AI can make the resulting decision appear neutral. This creates a risk that suppliers may be disadvantaged without an adequate mechanism to interrogate, dispute or amend the data and assumptions underlying an automated recommendation.

For management accountants, these ethical considerations create important financial and strategic trade-offs. Contemporary management accounting frameworks, including the principles associated with integrated reporting and global management accounting, recognize the importance of protecting and enhancing value across multiple forms of capital, including social, relationship and manufactured capital.

A procurement strategy focused solely on short-term cost reduction through aggressive automation may therefore undermine long-term organizational value. Excessive dependence on algorithmically selected mega-suppliers can reduce supply-chain diversity and increase concentration risk. It may also expose organizations to legal and reputational risks as ESG-related reporting and due-diligence requirements continue to develop.



The Management Accountant's Role

The vulnerabilities discussed represent a tangible danger to the natural selection in sourcing and implies the need to extend the boundaries of the actions that a chartered management accountant should be able to execute (Mhlongo, 2025). Finance executives can no longer be passive audiences of software-generated reports, or themselves be in a position of treating AI sourcing models as if they are frozen, static tools. Instead, management accountants need to make themselves the active regulators of the enterprise's algorithmic and decision-making structure. This reconceptualization involves the modification of traditional management accounting control schemas – such as COSO Internal Control and Enterprise Risk Management (ERM) to address control in an AI-powered strategic sourcing.

Audits for Data Integrity and Provenance

Prior to training a machine learning model or putting that model into ERP procurement modules, the management accounting process needs to conduct rigorous data quality and provenance audits. This requires mining historical purchase order databases, supplier performance scores, and contract award records for historical biases, missing data points, or region-based procurement anomalies (Coles, 2025). Cleaning and rebalancing training data can ensure that the algorithm does not carry forward flawed historical biases.

Algorithmic Auditing and Model Validation

In the same way that physical inventory counts and financial internal control testing are performed by management accountants, algorithmic audits must be conducted periodically. The reviews analyze model settings to ensure that the software recommendation engine continues to be in line with the strategic business priorities, ethical principles, and risk tolerance levels of the firm (Shahbazbeigi, 2024). Sensitivity analyses should be performed to determine how the algorithm ranks suppliers if the assessment parameters change, for example, if the business size is larger or smaller, if the geographic origin is different, or if the length of operating history is longer or shorter.

Implementing Human-in-the-Loop (HITL) Controls

The AI structures need to be developed with well-defined policy thresholds to distinguish when turning over control to human strategic decision-making (Kumar et al., 2024). They explain that



although routine, low value indirect purchases (e.g. regular office supplies or small-scale maintenance products) can also be procured through automation with no risk involved, the contracts for high-value, strategically sensitive or critical elements need to have a Human-in-the-Loop (HITL) design. HITL systems enable the AI to function solely as a decision-support intelligence product, highlighting data, flagging risks, and ranking options, while human procurement deliberative bodies continue have final decision making power and operational responsibility.

Multi-Criteria Utility Function Design

Traditional procurement models are often constrained only by the desire to minimize cost. Management Accountants' need to work with cross functional teams to translate these mathematical loss functions into multi-criteria decision-making frameworks. This might mean integrating weighted parameters around vendor ESG performance, supplier diversity, carbon intensity, and procedural justice within the utility computation of an algorithm (Abdulla, 2022). This can allow the AI to seek to maximize whole-enterprise corporate value as opposed to narrow, short-term reductions in unit costs.

Conclusion

The application of enterprise-wide Artificial Intelligence to business procurement is a paradigm shift in enterprise management. As shown by enterprise leaders such as Siemens, AI solutions provide tangible operational benefits, significantly relieving the burden of manual research work, shortening cycle times, and offering strategic sourcing insight in the face of global supply chain disruptions (Ayibam, 2025). The economic and tactical cases for enabling AI in enterprise procurement are compelling. However, efficiency should not be achieved through compromising moral soundness, systemic fairness, and long-term governance.

AI algorithms are neither inherently strategically wise, nor do they have moral agency: they are mathematical mirrors reflecting historical data, assumptions, and managerial biases embedded within them. If not properly addressed, automated procurement systems also have the potential to perpetuate historical biases, exclude diverse supplier communities, violate vendors' economic rights, and expose organizations to legal and ESG risk, an alarming prospect. Hence management accountants also need to evolve their professional responsibilities. Finance leaders should not only consider the immediate line-item cost reductions, but also the second-order system effects of such automated choices. Through robust algorithmic governance, data integrity audit enforcement, human-in-the-loop control thresholds, and multi-criteria end-to-end modeling design, management accountants can guide AI to be an effective lever of both organization-level efficiency and ethical stewardship (Salerno, 2026).

References

- Sarkar, S., Solanki, S.K. and Gaikwad, M.H., 2025. Effective Vendor Management. *Risk Management*, 5(3).
- Shaik, A.S., 2026. AI Procurement as Competitive Advantage: Build, Buy, Partner, and the New Make-or-Buy Decision. Buy, Partner, and the New Make-or-Buy Decision (April 01, 2026).
- Ho, A., 2025. Artificial intelligence and its application in procurement.
- Lo Ribeiro, J., Plangger, K. and Montecchi, M., 2026. Decoding Responsible Procurement: Conceptualizing Bias Co-evolution in AI-aided Organizational Decision-making. *British Journal of Management*, 37(1), p.e70027.
- Akhtar, L., 2025. Procurement 4.0: Investigating AI adoption for intelligent and resilient supply chains.
- ARTS, O.M.O.L., 2025. SHADOWS, SIMULATIONS, AND HALLUCINATIONS (Doctoral dissertation, STANFORD UNIVERSITY).
- Clarkson, M., 2026. Artificial Intelligence And Machine Learning In Procurement Decision-Making. *Journal of Procurement & Supply Chain*, 10(1), pp.1-13.
- Theodorakopoulos, L., Theodoropoulou, A. and Halkiopoulou, C., 2025. Cognitive bias mitigation in executive decision-making: A data-driven approach integrating big data analytics, AI, and explainable systems. *Electronics*, 14(19), p.3930.
- Muldoon, J., Cant, C., Graham, M. and Ustek Spilda, F., 2025. The poverty of ethical AI: impact sourcing and AI supply chains. *AI & society*, 40(2), pp.529-543.
- Rainy, T.A. and Chowdhury, A.R., 2022. The role of artificial intelligence in vendor performance evaluation within digital retail supply chains: A review of strategic decision-making models. *American Journal of Scholarly Research and Innovation*, 1(01), pp.220-248.
- Pal, K., 2026. Ethical and Regulatory Bias in Artificial Intelligence-Based Applications for Supply Chain Activities. In *Navigating Accountability and Human Rights in AI-Powered Supply Chains* (pp. 133-164). IGI Global Scientific Publishing.
- Mhlango, A.F., 2025. The impact of artificial intelligence on the role of management accountants. In *Artificial Intelligence in Accounting, Auditing and Finance: A Guide for Implementation and Use* (pp. 63-82). Cham: Springer Nature Switzerland.
- Coles, A.B., 2025. Optimizing the AI Data Supply Chain: A Framework for Strategic Sourcing and Risk Management. Chicago Booth Accounting Research Center Research Paper No. Forthcoming.
- Shahbazbeigi, A., 2024. Application of Artificial Intelligence and Machine Learning in Accounting and Auditing. *Transactions on Data Analysis in Social Science*, 6(2), pp.92-108.
- Kumar, S., Datta, S., Singh, V., Datta, D., Singh, S.K. and Sharma, R., 2024. Applications, challenges, and future directions of human-in-the-loop learning. *IEE Access*, 12, pp.75735-75760.
- Abdulla, A., 2022. Combining Artificial Intelligence and Multi Criteria Decision Making Approaches for Supplier Selection (Doctoral dissertation, University of Huddersfield United Kingdom).
- Ayibam, J.N., 2025. Artificial intelligence in public procurement: Legal frameworks, ethical challenges, and policy solutions for transparent and efficient governance. *Alkebulan: A Journal of West and East African Studies*, 5(2), pp.54-69.
- Salerno, B., 2026. AI Architecture for Intelligent Supply Chains (Doctoral dissertation, Politecnico di Torino).



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