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Generative AI in procurement and supply chain management

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Last week, I attended the ISM WORLD 2024 conference, hosted by the Institute for Supply Management. I participated in affiliation with Tom Lu and with Veriforce's new service offering, Procurement and Supply Chain Expert Services. I was privileged to meet many wonderful people and to learn about recent enhancements to Veriforce's risk management services. In addition to being highly effective in mitigating compliance and safety risks related to a front line work force, these services can cut procurement costs of contractor pools. Veriforce's offering is a game-changer, and is compelling especially when safety, technical expertise, certification of capability, and/or compliance/regulations are at play.

ISM gave me the opportunity to catch up on the state of generative AI in the context of procurement and supply chain management. Generative AI has been broadly accessible for little over 18 months, so the adoption to/in procurement is at an early stage. I attended sessions that provided case studies of generative AI used in corporate environments (Dagmar Laue of DuPont gave a particularly illuminating presentation covering a range of use cases that have been implemented at DuPont). I listened to other experts outline risks, mitigations, and best practices in governance, associated with the use of generative AI. Also, Zycus provided attendees with a self-published short book called "10x source-to-pay with Gen AI" which summarizes a number of use cases and provides insights into how to leverage AI.

Table 1 below provides a summary of current and potential applications for generative AI in procurement and supply chain management. It is a compilation of learnings from the sessions at ISM, the book by Zycus cited above, interactions with a number of individuals, and prior experience (principally, collaboration with Axtom, a company that uses AI to automate tail spend negotiations).

Area of use	Functions or tasks that may leverage AI
Demand forecasting	• Recognize/ describe trends and patterns of usage • Develop demand forecast recommendations
Spend analysis	• Clean and categorize data • Assist in constructing spend cube • Identify potential anomalies or data gaps and inconsistencies
Market intelligence	• Identify potential trends and risks in supplier market and in supply chain • Predictively model supply opportunities and risks (new capabilities, capacity constraints, etc.) • Perform preliminary overview of product segments, production processes, and cost drivers
Supplier analysis, selection	• Perform supplier search and supply market summary • Provide a first-cut qualitative or quantitative evaluation of suppliers (capabilities, capacity, risks, relative market performance)
Strategy development	• Identify strategic goals for a specific supplier relationship
Negotiation strategy and execution	• Identify and prioritize preliminary list of goals to be negotiated • Develop LAA, MDO, and BATNA targets for some goals • Serve as a thought-partner to develop preliminary script as well as to test the scripts in role as the counterparty • Collect and organize meeting minutes from the negotiations and summary of agreed terms
Contracting	• Provide first-cut contract review (by sections of contract) • Provide draft of terms to include in contract
Supplier implementation	• Develop framework and plan for implementation
Supplier relationship management	• Consolidate metrics and identify priorities for improvement • Write 1st draft of written communications to suppliers • Together with RPA, facilitate email communications work flow
Contract administration	• Analyze and summarize contract terms • Develop prioritized plan for managing compliance to terms
Contractor management	• Identify patterns of performance, utilization, and opportunities to improve efficiency and effectiveness of contractor relationship
Purchase requisitions and orders	• Develop requirements and create orders in natural language with end-users • Recognize patterns and predict requirements, propose alternatives
Transaction processing (invoices, payments)	• Match and validate invoices • Recognize patterns of usage for detection of waste, abuse, and opportunities for more efficient procurement
Tail spend procurement	• Perform aspects of tail spend analysis • Automate or facilitate aspects of negotiations and contracting
Inventory mgmt..	• Identify patterns in stock levels and opportunities to improve service levels and turns
Risk management	• Identify patterns in stock levels • Identify opportunities to improve both service levels and turns
Continuous improvement	• Identify opportunities to improve value (cost, throughput, cycle times, service levels) • Support workflow and process of continuous improvement process
ESG	• Identify risks and opportunities in ESG • Coordinate aspects of ESG programs in supply chain operations
Other administrative tasks	• Serve as chatbot for procurement and supply chain help desk • Draft employee performance reviews (starting with manager input)

Table 1: Use cases for AI and related technologies in procurement and supply chain management

I have seen examples of most of these applications; a few are drawn from use cases in other contexts that extend logically to procurement and the supply chain. It's likely that all of these applications are already in use to some degree, somewhere.

It appears the technology has sufficiently matured to the point where we have line of sight to widespread and high-value applicability in procurement and in the supply chain. Even if many of the examples do not seem transformational yet. They will soon enough.

Generative AI comes with risks and caveats. Anyone intending to apply generative AI should be aware of the cost of entry, as it were. This cost of entry is not just the investment in dollars; in fact, financial costs are (still) relatively low. The more important hurdles are the learning curve for using the tools effectively and safely, and for developing guardrails to mitigate known risks and deficiencies.

Table 2 below summarizes many but certainly not all of these risks. As with the table above, this table is a compilation of findings from many sources, both at ISM and elsewhere. But it is by no means complete.

• Leaking of/compromising proprietary information through the public AI tool
• Data informing the Generative AI tool is backward-looking, and the most recent data may be several years old
• Hallucinations (the generative AI platform makes stuff up)
• Lack of rigor and relevance of responses; data used by the AI platform is incomplete, incorrect, or biased
• Ineffective governance/ guardrails over confidential data and quality of results, including: ill-defined roles and accountabilities, lack of risk and ethics policies, inconsistent practices
• Ineffective usage: users are not skilled in creating prompts that generate usable or reliable results
• Black swan events associated with using new technologies: flash crashes, hoarding/ overoptimization scenarios
• Liability for autonomous actions by AI platform
• Costs of implementation and of usage
• Manipulation the platform's performance by bad actors
• Cybersecurity risks
• Ethical risks and considerations, including biases due to limitations of source data and trade-offs in replacing humans with machines

Table 2: Considerations in deploying and using generative AI (in no particular order of priority)

As a final note, 2024 is the time to step into the development and application of AI solutions in the supply chain. The learning curve to use the tools is still relatively low (there aren't many experts yet), and the supply chain is a target-rich environment. There are lots of ways to make ourselves useful and to create new value.

This article was not written with the aid of generative AI. All errors herein are my own.

The author, Peter Benda, is a 30 year veteran management consultant. His client work includes strategic sourcing and supply chain management, workforce effectiveness, front line productivity improvement, governance design, and data analysis. His industry experience includes mining, utilities, manufacturing, financial services, transportation, defense R&D, federal and state agencies, and technology startups. He has published market research and holds several patents.