PROCUREMENT TRANSFORMATION
IN THE AGE OF GENERATIVE AI

Procurement Transformation in the Age of Generative AI

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Introduction

Generative AI is garnering significant attention in the business world with its impressive human-like creative capabilities. Ever since the release of ChatGPT, organizations worldwide have been keenly exploring its applications. As technology evolves on an ongoing basis, it continues to have a profound impact on business functions, and the procurement function is no exception. Over time, procurement has evolved from a back-office function to a strategic line of business, with its priorities extending beyond delivering traditional cost savings to establishing strategic supplier relationships, managing risk dynamically and proactively, and ensuring business continuity.

Technology plays a key role in enabling procurement organizations to deliver value beyond cost savings by leveraging data to improve efficiency, productivity, and accuracy across processes. However, procurement organizations are not at the forefront of adopting advanced digital solutions compared to business functions such as Finance and Accounting (F&A) and Human Resources (HR). While procurement has shown some interest in advanced technologies such as AI-/ML-based analytics and Intelligent Document Processing (IDP), the overall adoption of cognitive solutions continues to be at a nascent stage. The emergence of AI-/ML-powered cognitive solutions that can assist in decision-making is opening new opportunities to transform procurement operations.

Recent developments in the maturity of AI models, faster system computation power, and the availability of high-quality model training data are redefining technologies such as generative AI. These AI models can generate unique content in the form of text, images, videos, audios, code snippets, and synthetic data. Generative AI is expected to further augment the applicability and capability of existing AI-based solutions leading to potentially higher adoption and impact. With organizations across industries exploring ways to leverage generative AI capabilities in their operations, procurement leaders are also keenly tracking developments in this space to identify potential high-impact use cases across the Source-to-Pay (S2P) value chain as part of their transformation journeys.

In this viewpoint, we explore digital transformation of procurement operations in the generative AI age, including:

- Current state of digital adoption in procurement
- Use cases of AI-/ML-based solutions across the S2P value chain
- Advent of generative AI and its implications
- Use cases of generative AI within procurement operations and their prioritization
- Key considerations to ensure successful implementation of generative AI solutions

Current state of digital adoption within procurement

Many organizations still rely on legacy systems that leverage traditional technologies to run their procurement operations. Thus far, procurement organizations have not adopted AI-/ML-based cognitive solutions at scale. While technology and service providers also play a key role in driving the digital transformation of most organizations' procurement operations through their varied offerings, even in these cases, the adoption of solutions with traditional technology capabilities is higher than advanced technology capabilities.

Digitalization of procurement has traditionally focused on leveraging basic analytics, Robotic Process Automation (RPA), and rule-based chatbots. Basic analytics capabilities help in streamlining data management, reporting, and dashboarding. RPA-enabled automation of repetitive processes reduces turnaround time and manual effort, allowing organizations to divert their resources to activities that are more strategic and judgment intensive. Rule-based chatbots assist in promptly answering generic queries from various stakeholders. The adoption of these technologies is driven by factors such as rapid realization of benefits, low cost of implementation, and high ease of adoption.
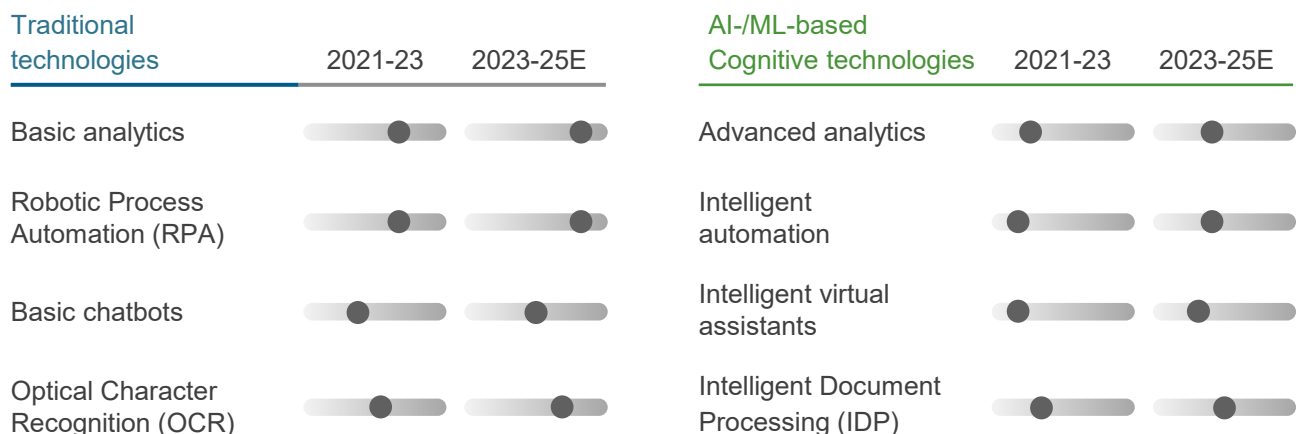
More mature procurement organizations have adopted advanced technologies but on a limited basis. Some organizations adopt advanced technologies such as IDP capabilities for the automated extraction of unstructured data from documents, which saves manual effort and time. In some situations, AI-based advanced analytics is used either through S2C and P2P suites or analytics tools to enable informed decision-making. Additionally, the adoption of AI-powered intelligent automation solutions is advancing RPA capabilities towards automating complex workflows and processes. Process mining solutions with cognitive capabilities are also complementing automation efforts by identifying process roadblocks. However, high costs, lack of historic data, disparate systems, skill gaps, and lack of clarity on RoI are limiting the adoption of advanced technologies.

Exhibit 1 illustrates this digitalization journey of procurement organizations and shows that adoption is high and gradually growing for traditional technologies but quite low despite gradual growth for advanced cognitive technologies.

EXHIBIT 1

Adoption of various technologies in procurement
Source: Everest Group (2023)

Low ➝ High

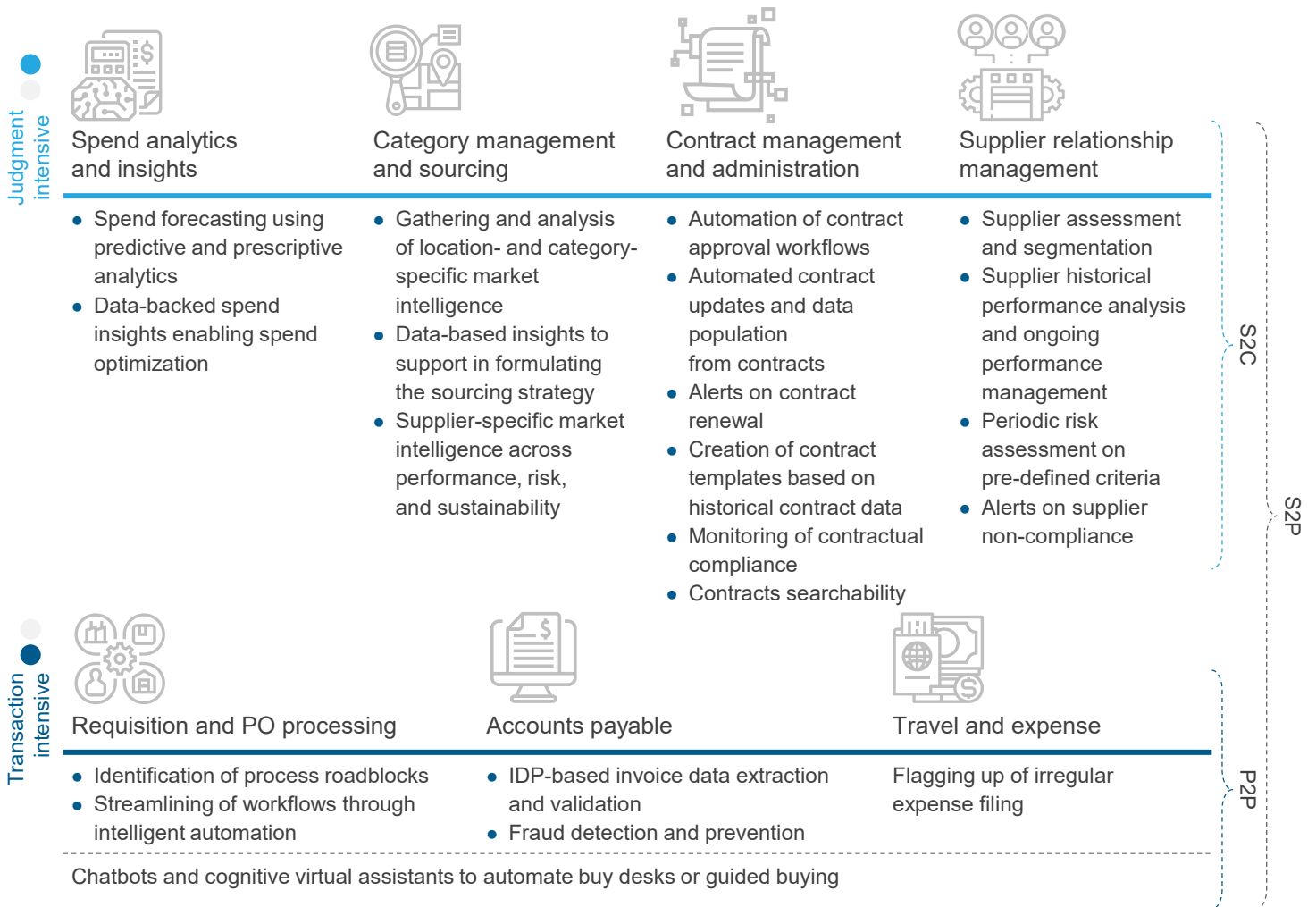| Traditional technologies	2021-23	2023-25E	AI-/ML-based Cognitive technologies	2021-23	2023-25E
Basic analytics			Advanced analytics		
Robotic Process Automation (RPA)			Intelligent automation		
Basic chatbots			Intelligent virtual assistants		
Optical Character Recognition (OCR)			Intelligent Document Processing (IDP)		

Opportunity to leverage AI/ML capabilities

Despite low adoption, AI/ML technologies offer a wide range of applications within procurement to drive value acceleration. As Exhibit 2 shows, organizations should look to embed AI capabilities across the S2P value chain for improved efficiency and accuracy.

EXHIBIT 2

AI/ML use cases across the S2P value chain

Source: Everest Group (2023)

Judgment intensive

Spend analytics and insights

- Spend forecasting using predictive and prescriptive analytics
- Data-backed spend insights enabling spend optimization

Category management and sourcing

- Gathering and analysis of location- and category-specific market intelligence
- Data-based insights to support in formulating the sourcing strategy
- Supplier-specific market intelligence across performance, risk, and sustainability

Contract management and administration

- Automation of contract approval workflows
- Automated contract updates and data population from contracts
- Alerts on contract renewal
- Creation of contract templates based on historical contract data
- Monitoring of contractual compliance
- Contracts searchability

Supplier relationship management

- Supplier assessment and segmentation
- Supplier historical performance analysis and ongoing performance management
- Periodic risk assessment on pre-defined criteria
- Alerts on supplier non-compliance

S2C

S2P

Transaction intensive

Requisition and PO processing

- Identification of process roadblocks
- Streamlining of workflows through intelligent automation

Accounts payable

- IDP-based invoice data extraction and validation
- Fraud detection and prevention

Travel and expense

Flagging up of irregular expense filing

P2P

Chatbots and cognitive virtual assistants to automate buy desks or guided buying

While AI capabilities can have immensely transformative applications within procurement, significant human intervention is still required to run procurement operations from end to end. This is due to the need for judgment in activities such as the creation of documents for requisitions, purchase orders, invoices, RFXs, and contracts, customization of which depends on spend category, location, and decision-making processes (including approvals within P2P, sourcing strategy, negotiations, and category management). As AI models evolve, their ability to overcome current limitations and drive transformation will increase.

Emergence of generative AI and its potential implications

Generative AI models are trained on large amounts of data and built on Large Language Models (LLMs), which enable them to create content beyond their training data. This brings their creative and innovative problem-solving and content-generation abilities very close to those of a human. Generative AI's uniqueness lies in its ability to create new data similar to, but not a copy of, the training data, enabling it to self-learn continuously. These models can be creative beyond predefined tasks, domains, and existing patterns to create new outputs not necessarily from historical data or associated patterns.

While earlier AI solutions could also identify patterns, forecast trends, and help predict future outcomes, their outputs were primarily based on available historical data fed into the model, and they lacked the ability to generate creative outputs beyond the data set. Generative AI can act according to the uniqueness of the situation and solve new problems despite not having recorded data of the same situation or problem fed into the model. Traditional solutions follow a rules-based approach in which predefined criteria and rules across parameters drive outputs. They lack the innovative capabilities of generative AI, making them rigid and domain or purpose specific. Exhibit 3 depicts the superior capabilities of generative AI over previous AI/ML models.

EXHIBIT 3

Enhanced capabilities of generative AI vis-à-vis previous AI models

Source: Everest Group (2023)

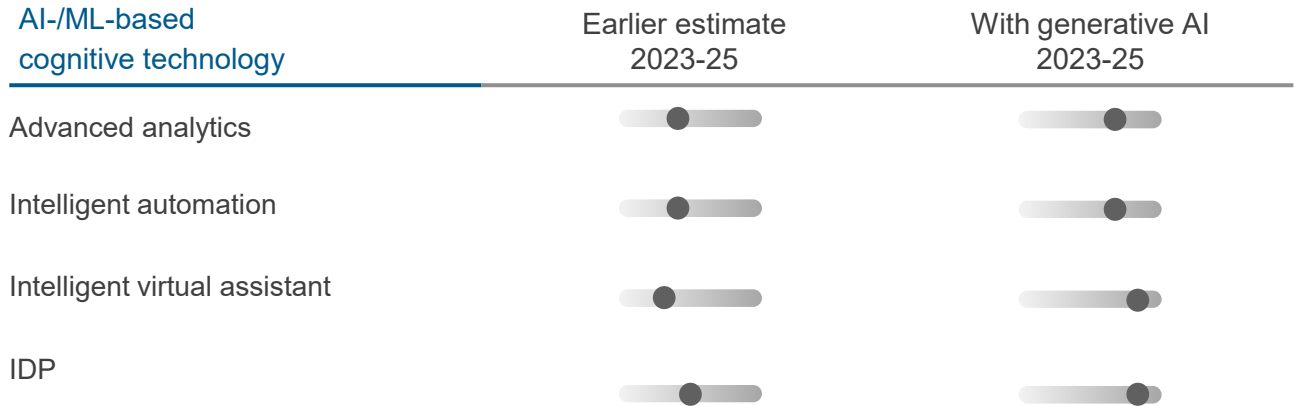| AI capabilities	Generative AI capabilities
Ability to identify patterns from historical data	Ability to innovate beyond historical data
Rules-based predefined scope of operations	Creative problem-solving abilities beyond current scope
Ability to create per defined templates	Ability to create per unique prompts beyond existing templates
Intelligence limited to small training dataset	Evolving intelligence due to its ability to create training data by itself
Natural language processing capabilities	LLM capabilities

Furthermore, generative AI can enhance the applications of advanced cognitive solutions, driving increased adoption, as shown in Exhibit 4. Outsourcing service and technology providers are expected to contribute to this trend by augmenting their existing solutions with generative AI capabilities.

EXHIBIT 4

Change in the adoption of cognitive technologies with the use of generative AI   Low ———▶ High

Source: Everest Group (2023)

AI-/ML-based cognitive technology	Earlier estimate 2023-25	With generative AI 2023-25
Advanced analytics	●———	——●——
Intelligent automation	●———	———●—
Intelligent virtual assistant	●———	———●—
IDP	●———	———●—

Organizations are realizing that generative AI can significantly accelerate the value driven by AI/ML solutions and improve the outcomes and RoI from such solutions. While still in an exploratory phase, generative AI's use cases show high potential throughout the S2P value chain, which includes many processes that require creative content generation and innovative problem-solving capabilities. Generative AI can play a key role in further transforming procurement operations, not merely as a sophisticated tool but as an integral element of the procurement digital ecosystem.

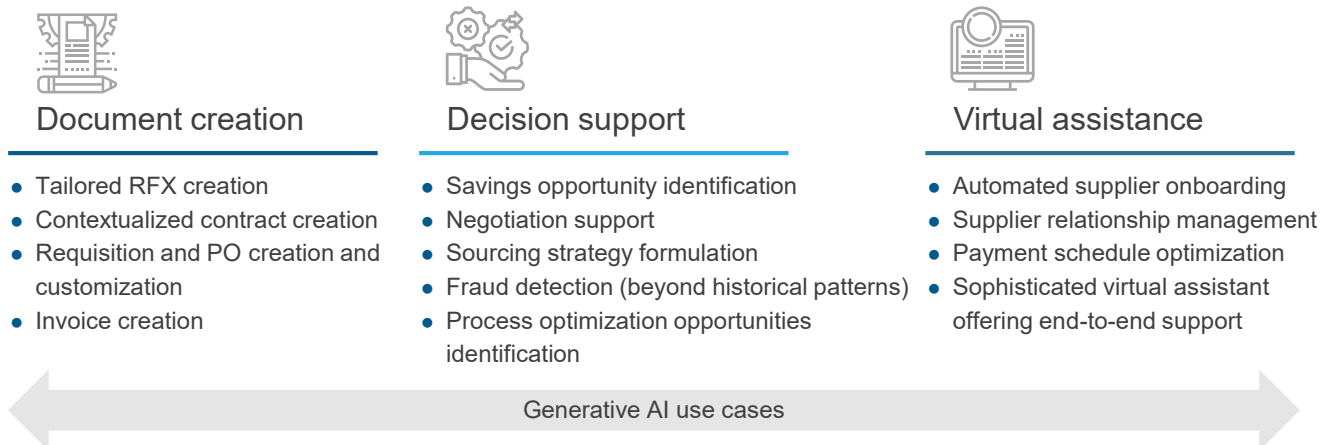# Transforming procurement operations through generative AI

Organizations are exploring many potential use cases of generative AI technology across the S2P value chain. These use cases can be broadly classified into three categories, as Exhibit 5 shows.

EXHIBIT 5

Applications of generative AI in procurement

Source: Everest Group (2023)   *NOT EXHAUSTIVE*

Document creation
- Tailored RFX creation
- Contextualized contract creation
- Requisition and PO creation and customization
- Invoice creation

Decision support
- Savings opportunity identification
- Negotiation support
- Sourcing strategy formulation
- Fraud detection (beyond historical patterns)
- Process optimization opportunities identification

Virtual assistance
- Automated supplier onboarding
- Supplier relationship management
- Payment schedule optimization
- Sophisticated virtual assistant offering end-to-end support

◀————————— Generative AI use cases —————————▶

We take a closer look at these applications below.

Document creation

S2P involves multiple transactions and associated documentation within its workflows. Key documents include requisitions, purchase orders, invoices, RFXs, and contracts. Generative AI can help automate the creation of these documents beyond predefined templates. It can create the desired type, format, and template of these documents almost immediately through appropriate prompts. Though the process may need human monitoring and quality approval, it reduces the time and effort required to manually create these documents repeatedly for different categories, suppliers, and locations.

Decision support

Organizations can consider a comprehensive generative AI model built to assist in procurement operations as a round-the-clock subject matter expert, with a human evaluating and validating its outputs. They can use these models to identify suppliers based on parameters such as location, historical performance, financial health, service capability, pricing, languages supported, and shoring mix. Furthermore, the model can help assess and execute supplier onboarding with a high degree of automation. Generative AI can also guide and possibly drive supplier negotiations on behalf of organizations. It can compute real-time pricing benchmarks and derive insights from market intelligence and historically recorded negotiations to help develop better negotiation strategies.

Thanks to its human-like conversational style, coupled with its data processing and analytics capabilities, generative AI can be used to better manage supplier relationships. It can automatically ask for any additional data required from suppliers, run periodic performance evaluations through customized scorecards, detect and flag anomalies in the information submitted, and continuously monitor supplier risks. While it can help automate these repetitive but value-building activities, it can also improve these activities by not just identifying the problem but offering recommendations to solve them. Similarly, it can evaluate interactions concerning a specific supplier and suggest corrective steps to improve the relationship.

With its innovative abilities, generative AI can suggest ways to optimize processes across the value chain, including:

- Suggesting edits within the scorecard for more accurate evaluation
- Identifying service areas with scope for innovation
- Flagging up bottlenecks in the supplier governance model
- Suggesting payment schedules to optimize invoice processing
- Contextualizing RFXs to include specific requests based on the sourcing strategy
- Building contracts suitable to specific regions or locations to comply with local regulations by customizing clauses
- Evaluating workflows and suggesting process improvements

Generative AI can act as a valuable assistant to leadership teams by helping formulate various strategies, keeping in mind the end objectives. So far, organizations only relied on AI-generated insights based on limited data for running strategic upstream procurement processes. With its ability to understand multiple parameters and scenarios, generative AI can promptly help formulate a strategy considering organizational policies and priorities. During times of macroeconomic uncertainty and associated inflationary pressures, a key interest area for procurement stakeholders might be generative

AI's ability to identify cost-saving opportunities based on its understanding of organization-specific requirements, the supplier landscape, regional nuances, and category intelligence.

Virtual assistance

ChatGPT created almost instant awareness of generative AI's text generation capabilities. In procurement, organizations are showing interest in leveraging generative AI as a virtual buying assistant that could replace a human-run buy desk and transform guided buying. Generative AI can also be used to automatically generate responses to common procurement-related queries from employees, suppliers, or other stakeholders. This would reduce the workload of helpdesk agents, improve response time, and ensure consistency and accuracy in the information provided.

Optimizing AI implementation through prioritization

Considering the many generative AI use cases and their ability to enhance existing AI applications, organizations should prioritize the deployment of these technologies across the S2P value chain to optimize outcomes. Adoption potential and impact are the key dimensions to consider when prioritizing the implementation of cognitive solutions in a phased manner. Exhibit 6 shows a framework that can be used to prioritize AI implementation.

EXHIBIT 6

A framework for prioritizing AI implementation

Source: Everest Group (2023)

NOT EXHAUSTIVE

- Generative AI-augmented earlier AI use cases
- Generative AI-specific use cases

Financial impact
Impact on spend savings and cost of procurement operations: the higher the savings, the higher the impact; the lower the costs, the higher the impact

Operational impact
Impact on the accuracy, efficiency, and productivity of processes and resources; for example, turnaround time, speed-to-value, etc.

Business impact
Impact on risk and compliance, stakeholder experience, and satisfaction in terms of accuracy, value, ease, and accessibility

Opportunistic
- Category management support
- Identifying savings opportunities
- Negotiation support
- Contract optimization
- Supplier risk management

Accelerate
- Supplier base insights
- Guided buying support
- Spend analytics
- Cognitive virtual assistant (procurement helpdesk)
- Market intelligence
- Supplier onboarding
- Supplier identification
- Customized document creation (RFxs, POs, PRs, etc.)

De-prioritize
- Sourcing strategy formulation support
- Optimizing supplier relationships

Vigilance
- Process optimization
- Contractual compliance
- Fraud detection
- Supplier performance management

Impact: High / Low
Adoption potential: Low / High

Business criticality
Criticality of the activity influences the need for checks and balances through human intervention to ensure quality and consistency

Data constraints
Lack of availability of initial training data and confidentiality of available data restricts adoption potential and applicability

Process complexity
Process complexity depends on the reasoning and judgment involved in the process – lower complexity means higher adoption potential

We have segregated example use cases across four quadrants based on their expected level of impact and adoption potential.

Accelerate

Use cases in this quadrant are the low-hanging fruits that the procurement ecosystem can quickly adopt to kick-off the AI-powered transformation journey. These use cases have high adoption potential and are expected to create high impact, making them cost-effective and easy to implement. For example, organizations can leverage generative AI-based cognitive virtual assistants to streamline their procurement helpdesk to drive impactful outcomes by improving efficiency, ensuring accuracy, and automating routine queries from internal and external stakeholders with limited human supervision. Generative AI-based solutions can also help in automating the creation of various procurement-related documents (PRs, POs, RFXs) as per specific requirements.

Opportunistic

Organizations can start planning for the implementation of these use cases due to the expected high impact offsetting increased effort for implementation. These use cases require more attention since they have lower adoption potential due to concerns related to data confidentiality, lack of streamlined processes, and high business criticality. Use cases such as negotiation and identifying savings opportunities support using AI/ML solutions have significant financial impact leading to increased savings and improved efficiencies. However, the data needed to train the AI model for this purpose is highly sensitive and requires careful implementation to ensure data security and confidentiality.

Vigilance

The nature of certain processes or their lack of strategic or operational importance may create low impact despite their high adoption potential. Organizations need to be vigilant in implementing these use cases and prioritize them based on specific requirements. For example, generative AI can help in streamlining the supplier performance management process which involves periodic performance surveys and scorecards, ensuring compliance with SLAs/KPIs, and initiating improvement plans.

De-prioritize

Organizations should embrace a wait-and-watch attitude towards processes in this quadrant. Implementation of generative AI solutions for these processes is not worth the effort given the current maturity of generative AI solutions, process complexity, and the (un)availability of secure data practices.

Generative AI-based cognitive virtual assistants can potentially streamline procurement helpdesk to drive impactful outcomes by improving efficiency, ensuring accuracy, and automating routine queries from internal and external stakeholders with limited human supervision.

Key considerations for implementing generative AI

When implementing AI, especially generative AI solutions, organizations need to overcome the challenges that market factors, internal technological limitations, talent constraints, and any apprehensions towards change pose. They should bear in mind the considerations illustrated in Exhibit 7 as they forge ahead on the generative AI path.

EXHIBIT 7
Key considerations for generative AI implementation
Source: Everest Group (2023)

Concerns with generative AI adoption

Cost implications
- Technological
- Operational
- Environmental

Data security challenges
- Confidentiality
- Data privacy

Ethical concerns
- Accountability
- Bias

Organizational preparedness considerations

Skill gap
- Upskilling
- Employee apprehensions

Data management practices
- Data governance
- Availability of quality data

Integration with existing technologies
- Computational power
- Restructuring of technology stack

Concerns with generative AI adoption

Cost implications

Implementing or developing AI capabilities can be expensive for organizations, especially for those looking to build generative AI capabilities in-house, as such capabilities rely on LLMs and specialized hardware with high computational power. However, organizations can optimize their RoI depending on the scale of operations and the ability to leverage across organizational functions. At their end, service providers and technology vendors are working to embed generative AI into their existing tools and service offerings on top of their current AI capabilities. With economies of scale, they can absorb additional costs of leveraging generative AI within the solution/service pricing. As generative AI technology continues to evolve, we expect it to become cheaper and more accessible.

In addition to technology costs, the cost of running and maintaining the technology is also significant, especially given the high computational power and storage required for generative AI models. Notably, at a time of growing awareness of sustainability, a drastic increase in carbon footprint due to the adoption of this technology hinders organizational and larger societal goals to achieve carbon neutrality. This warrants a revamp of sustainability planning based on new energy demand forecasts considering usage of generative AI.

Data security challenges

It has been challenging for governments, industry bodies, and individuals to ensure data privacy and security in the digital age. Despite significant global efforts to establish strong data privacy and security laws, achieving total compliance in the ever-changing digital world seems to be a struggle. Generative AI poses a new and significant risk to data privacy and security concerns. While governments and industry bodies have built guardrails to prevent misuse, they have not yet developed a foolproof solution.

Individuals continue to express concerns about how their publicly available data can be misused through generative AI solutions to create new content without any accountability. Organizations have similar concerns with regard to their highly confidential information. However, organizations can add data security layers to contain confidential information in trusted systems. Deploying solutions on secure cloud networks can efficiently control the outward interaction of organizational solutions with the internet.

Ethical concerns

At current maturity levels, generative AI poses ethical challenges as it lacks accountability and is prone to bias. To ensure appropriate checks and balances, organizations need to define accountability and responsibility for the output created using generative AI solutions. Reliability and transparency of data sources is also an issue. Furthermore, high confidence in generative AI responses without checking for their credibility can lead to a hallucination bias.

The evolution of generative AI technology can resolve some of these challenges. Explainable AI is an anticipated transformation of generative AI in which the tool offers justification for its outputs. In the meantime, organizations should adopt tools that assist in quality checking and establish good governance practices for human-machine interactions, with human intervention and approval ensuring responsible data practices and quality.

Organizational preparedness considerations

Organizations are burdened with internal change management over and above the challenges that technology poses. They need to adopt comprehensive change management strategies to embrace and leverage new technologies effectively, including:

Addressing the skills gap

Plugging the talent gap should be of high priority as most domain-specific professionals lack the technical know-how to efficiently use newly deployed solutions. Employees might also be deeply skeptical of the technology or adamantly opposed to adjusting to the transformative change in working. Incorporating upskilling and reskilling plans into the organizational talent management strategy can address employee concerns and ensure continuous improvement and speed-to-market with new technologies.

Managing data

The availability of quality data is critical for building training data sets. The lack of streamlined data management practices is a major roadblock, especially for internal procurement organizations where organization-specific data trains the solutions. Prioritizing data governance and embedding it into the organizational culture helps overcome data-related challenges. Additionally, providers are using data captured from their broader experience as training data. They are also building protection layers to keep confidential data within the organization.

Integrating with existing technologies

Existing organizational systems, including hardware, software, and governance mechanisms, may not necessarily align with the changes required for generative AI implementation. Organizations might need technology modernization, not just for the short-term implementation of AI solutions, but also keeping in mind their long-term impact.

The adoption of AI-based solutions is going to drastically alter the way human-machine interactions occur, thereby transforming the technology landscape and organizational structure, as Exhibit 8 shows. The technology stack design should serve the need for high computational power and integration across solutions to optimize the leverage of AI capabilities. Consequently, organizations will require restructuring to flatten hierarchies and establish collaborative teams to make AI an integral part of the organization.

EXHIBIT 8

Evolution of technology and organizational structure

Source: Everest Group (2023)

	Present	Future
Technology stack	• Computation on GPUs/CPUs hardware • Deployment on servers/cloud • Limited interoperability	• Computation on TPUs • Seamless integration with NLP, computer vision, and other AI tech • Edge-based deployment on IoT devices / smartphones
Organizational structure	• Hierarchical structure • Siloed teams • Major focus on domain expertise	• Flat structure • Collaborative teams • Equivalent focus on domain expertise, technical skills, and stakeholder management

Lack of streamlined data management practices is a major roadblock for many internal procurement organizations. Prioritizing data governance and embedding it into the organizational culture would help overcome data-related challenges for implementing AI solutions.

Conclusion

The transformation of procurement operations is an ongoing process involving significant enhancement of process workflows and digital adoption resulting in associated with improved supplier relations and higher cost savings. While technology has made significant strides in transforming procurement operations through automation, analytics, and cognitive capabilities, the adoption of advanced technology solutions has remained low for a long time. However, generative AI with its advanced capabilities can potentially accelerate transformation and significantly improve efficiency and productivity. It can further drive digital adoption of cognitive solutions within procurement by augmenting existing AI capabilities across the S2P value chain.

Generative AI offers a wide range of applications, including:

- Customized document creation across requisitions, purchase orders, invoices, RFXs, and contracts
- A comprehensive virtual assistant for answering queries and enabling guided buying
- Identification of the scope for process optimization
- Automation of supplier relationship management
- A strategic assistant to the leadership team
- Identification of cost-saving opportunities

While the cost of implementation is difficult to control and influence, organizations can prioritize use cases and ensure the change management required to mitigate implementation risks. With changing technology, organizations may need to undergo a structural shift to sustain and maximize value creation.

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