

AI for Government Procurement: A Practical Guide

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It seems like not a day goes by without a flood of headlines and articles about artificial intelligence (AI) appearing in our newsfeeds. But amid all the buzz, the real challenge lies in understanding how to harness this technological marvel in our day-to-day work.

With AI, it's not just about adopting the latest trends, but mastering the art of using it effectively. It's about deciphering how AI can streamline workflows, improve decision-making, and bring value. In a world saturated with AI headlines, the challenge is cutting through the hype and figuring out how to derive real value from it.



A lot of organizations follow hype cycles, getting enamored with a new technology and want[ing] to just go apply it to their business. But they lose sight of some important questions... What is the experience I'm creating for my employees? What strategic propositions am I trying to accomplish as a business? And how do I use this to pivot or accelerate that strategy? Top-performing organizations stay true to their business strategy and use AI as an accelerant.

Todd Lohr, Principal, KPMG, in the 2024 AI Outlook¹



How did we get here? A brief history of AI.



AI is not new. It was introduced decades ago. But it hadn't become broadly actionable until recently due to issues of computing power and data availability.

The journey of artificial intelligence has been nothing short of remarkable, characterized by distinct phases that have shaped its evolution over the decades.

1950s–1970s



AI emergence

In the early days of AI research, scientists laid the groundwork for the field, exploring foundational concepts and developing basic rule-based systems to solve specific problems. However, progress was slow due to limited computational power and data availability.

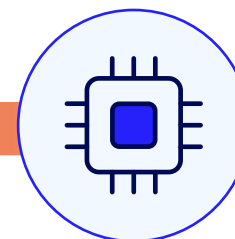
1980s–1990s



AI winter

The '80s and '90s marked a challenging period for AI, known as the "AI winter." It was a time when funding and interest waned due to unmet expectations. Despite advancements in expert systems, practical applications for AI remained elusive, particularly in the fields of natural language processing and perception.

2000s



Rise of machine learning

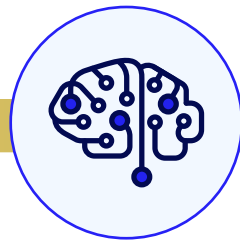
The 21st century saw a resurgence of interest in AI, driven by the rise of machine learning algorithms. This era was marked by the availability of big data and improved hardware, enabling the development of more complex AI models. Early business use cases emerged, including recommendation systems used by companies like Netflix and Amazon.

Deep learning and AI revolution

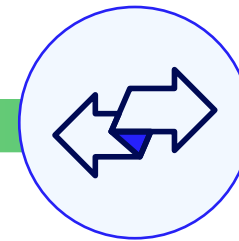
The 2010s witnessed a seismic shift in AI with the advent of deep learning. Deep neural networks unlocked new possibilities for AI, enabling remarkable progress in image and speech recognition as well as natural language understanding. This era also saw the rise of AI-powered virtual assistants, chatbots, and personalized user experiences. In recent years, AI has increasingly been used to automate routine tasks, transforming industries like manufacturing, logistics, and customer service and leading to increased efficiency and substantial cost savings.

AI in decision-making

Today, AI is making its mark on data-driven decision support. Organizations are leveraging AI to analyze vast amounts of data quickly and accurately, aiding in decision-making across industries such as healthcare, finance, and supply chain. AI's ability to sift through data and provide actionable insights is proving to be a game-changer in the business world.



2010-present



2020-present

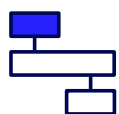
AI is not a new phenomenon, and its journey has been a rollercoaster ride of advancements, setbacks, and resurgences. And it will continue to play an increasingly significant role in shaping our world, offering unprecedented opportunities for innovation and transformation.

Unlocking the power of AI: Understanding key functionality.



Artificial Intelligence has permeated virtually every aspect of our lives, from the smartphones in our pockets to the recommendations we receive while shopping online. Behind the scenes, AI systems exhibit a range of functionalities that enable them to tackle complex tasks and provide valuable solutions.

We'll explore four main functionalities of AI that can have an impact on government procurement:



**Predictive
AI**



**Generative
AI**



**Anomaly-based
AI**



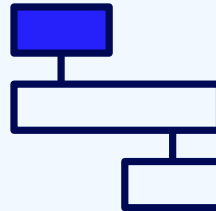
**Decision-based
AI**



It's not about the technology—all innovation starts with a problem to be solved. When you look at opportunity that way, it's important to focus on the 'why?' Why would we do this? Why are we trying to solve a particular problem? What's in it for us? Where is there value? Answer those, and then we can start getting to the how.

George Casey, Principal, Data Scientist, RSM US LLP, in the 2024 AI Outlook¹





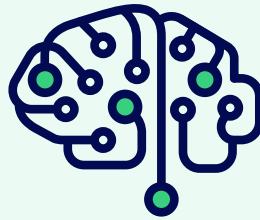
Predictive AI: Anticipating the future.

Predictive AI is like a crystal ball for data-driven decision-making. It harnesses the power of machine learning algorithms to analyze historical data and uncover patterns, trends, and relationships.

Predictive AI is revolutionizing the field of procurement by enhancing decision-making, optimizing supply chain management, and driving cost savings.

Government procurement professionals can leverage predictive AI to:

- **Forecast demand** by analyzing historical data, market trends, and other factors, such as seasonality and economic indicators. Better forecasting lets agencies keep inventory levels in line with demand to minimize shortages, saving costs and improving constituent satisfaction.
- **Reduce risk in vendor selection** by identifying both high-performing and problematic suppliers. AI can assess supplier performance based on past delivery times, quality of goods received, and contract compliance.
- **Predict market fluctuations**, enabling contracting professionals to plan purchases that coincide with lower market prices.
- **Analyze spend** to identify areas with potential for cost reductions or process improvements.



Generative AI: Creating content.

Generative AI empowers systems to generate new content, whether it's text, images, or even music. Text-based AI tools like ChatGPT are powered by large language models (LLMs) that gather a huge volume of information from sources across the internet. They track patterns in language usage from those sources to create meaningful content.

Generative AI is probably the first thing that comes to mind when talking about AI in procurement. Generative AI can automatically create procurement-related documents like purchase orders, invoices, contracts, and reports. This speeds up the procurement cycle by reducing the time and effort required for manual document creation.

In government procurement, generative AI can be harnessed to streamline processes, enhance communication, and facilitate decision-making. Here are several ways generative AI can enhance the procurement process:

- **Generate documents** based on predefined templates and input data. Generative AI can automatically create procurement-related documents like requests for information (RFIs), statements of work (SOWs), acquisition plans, and market research reports. It speeds up the procurement cycle by reducing the time and effort required for manual document creation.
- **Review contracts** to detect inconsistencies, errors, or missing clauses, improving contract quality and compliance.
- **Respond to vendor questions** in response to requests for proposals (RFPs) or requests for quotations (RFQs). Generative AI can analyze the requirements and provide tailored, well-structured answers, ensuring that procurement responses are comprehensive and competitive.
- **Improve vendor communications** using chatbots powered by generative AI that can answer common supplier queries, provide information about procurement processes, and even assist in scheduling meetings or negotiations.
- **Assist in market intelligence** by analyzing market data and identifying potential suppliers based on specific criteria.

Human workers who are familiar with procurement requirements should always review AI-generated documents for accuracy.



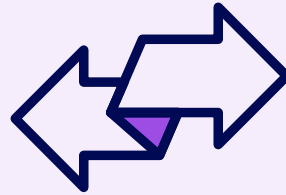
Anomaly-based AI: Unearthing irregularities.

Anomaly-based AI uncovers deviations from a usual pattern. For example, it is often used in cybersecurity to detect unusual activity.

Anomaly-based AI detects irregularities, ensures compliance, and improves the overall efficiency and transparency of the procurement process. Here are several ways anomaly-based AI can be used in government procurement:

- **Detect anomalies in bids and contracts.** AI can find suspiciously low or high prices in bid submissions, which may suggest bid rigging or collusion. It can also identify discrepancies between contract terms and actual performance, helping to prevent contract fraud.
- **Identify irregularities in supplier performance** such as delivery delays, quality issues, or deviations from contract terms, helping government agencies make informed decisions about contract renewals or penalties.
- **Identify unexpected cost increases** by comparing actual spending against budget allocations, and alert government agencies to potential cost overruns, cost outliers, or unapproved expenses.
- **Flag deviations from compliance rules** to ensure that all steps, from solicitation to award and contract management, adhere to legal and regulatory standards.
- **Detect fraud and corruption** by analyzing procurement-related data, including financial records and communications, to identify irregularities that may indicate fraudulent activities.
- **Analyze performance metrics** to find deviations from established standards such as on-time deliveries and product quality, and identify vendors who consistently underperform.
- **Mitigate supply chain issues** by identifying potential risks (such as natural disasters, geopolitical events, or even supplier financial instability), giving the agency time to develop contingency plans and diversify their supplier base.

Ensure that AI systems are regularly updated to adapt to changing procurement processes and regulations.



Decision-based AI: Guiding choices and actions.

Decision-based AI takes the lead when it comes to making choices or recommendations. It can tackle certain steps in the decision-making process, such as classifying items based on their characteristics, but leaves humans to make the final call. These systems use data and predefined rules to assist humans in decision-making processes. Here are several ways in which decision-based AI can assist in government procurement:

- **Assist in evaluating bids** by providing suggestions based on predefined criteria, historical performance data, and compliance requirements.
- **Help negotiate contracts** by analyzing contract terms and suggesting optimal negotiation strategies. AI can identify clauses that need attention, ensure that contracts align with regulatory standards, and assist in finalizing agreements that benefit the government.
- **Sort vendor queries** by topic, making it easier for subject matter experts to respond to queries and for procurement to send to the appropriate team for response. Automatically classifying queries using AI saves human workers many hours of tedious work.
- **Determine the most suitable sourcing strategies** by assessing factors such as cost, quality, delivery times, and sustainability, guiding agencies in making decisions about insourcing, outsourcing, or strategic partnerships.
- **Evaluate risks** associated with potential suppliers or contract terms by analyzing historical data and market conditions, and provide risk assessments and recommend strategies to mitigate risks related to procurement decisions.
- **Assist in allocating resources effectively** by optimizing budget allocation, identify cost-saving opportunities, and recommend resource allocation based on priority areas, strategic objectives, and compliance requirements.
- **Monitor compliance** and alert procurement officers to any deviations and suggest corrective actions to maintain compliance.

Top concerns about AI in government procurement.



Governments may be wary of using AI, having concerns about potential risks, ethical considerations, and the impact on society. Here are some common reasons for government caution regarding AI adoption in procurement.

Concern #1: AI will replace the human worker.

Governments may hesitate to adopt AI due to fears of job displacement and the potential impact on employment.

However, it is important to recognize that AI is a tool that complements human decision-making rather than replacing it. Procurement is a very strategy-driven role requiring a great deal of judgment. And we've all seen instances of AI "hallucinations"—where large language models perceive patterns or objects that don't exist. As a result, they create outcomes that are not faithful to the provided source content. They make stuff up.

While AI can help humans accelerate the procurement process—for example, by automating time-consuming tasks such as writing solicitations and statements of objectives—it's important to ensure that its use is accompanied by robust human oversight.



So far AI has been able to predict, recommend, detect, and converse, and now it can create as well, thanks to generative AI. This transformative capability positions AI as a digital assistant to humans, greatly amplifying human potential.

Hasit Trivedi, CTO Digital Technologies and Global Head – AI, Tech Mahindra, in the 2024 AI Outlook¹



Concern #2: AI will act unethically.

The use of AI raises several ethical concerns that are of critical importance to ensure fairness, accountability, and responsible use.

AI could inadvertently overlook potential conflicts of interest in procurement decisions. And AI systems can inherit biases leading to discriminatory outcomes, such as failing to consider small businesses. Unfair treatment of suppliers or contractors could potentially impact opportunities and equity in government contracts.

The opacity of AI decision-making can raise accountability issues. If AI were solely relied on for decision-making, it may be challenging to explain or justify why a particular supplier or bid was selected.

The data sets that AI is trained on are typically what introduces bias and unethical behavior. Organizations have to be very careful with the training sets they use, and they also have to set up monitoring mechanisms, just like before the advent of AI.

AI is not infallible and can make errors. Government agencies must define accountability mechanisms for AI-driven decisions that may result in mistakes or incorrect selections, particularly in high-stakes procurement contracts. While AI can streamline procurement processes, it should not replace human judgment and oversight.

Government agencies must maintain a balance between AI-driven automation and human intervention to ensure ethical and responsible decision-making.



A big risk lies in the data we use to train these models, particularly when that underlying data may lead to bias. With AI, we may institutionalize that bias because we base decisions on how we gathered the data, not necessarily what's appropriate or representative. So it's important to assess whether a dataset is appropriate to be used for a model or if it represents a specific bias that you wouldn't want to be pervasive.

George Casey, Principal, Data Scientist, RSM US LLP, in the 2024 AI Outlook¹



Concern #3: AI will expose private data.

The procurement process often involves handling sensitive data for government agencies and potential suppliers. Maintaining data privacy and security is paramount. Unauthorized access, data breaches, or misuse of sensitive information can lead to ethical violations and legal issues.

Using a private AI model can solve this issue. Private AI refers to methods of building and deploying AI technologies that respect the privacy of an organization's data and keeps you in control. Private AI models are trained on your data and the results are tailored to your organization, making them far more accurate than public, less personalized models.

With private AI, the data never leaves your control. The organization providing the AI services will not use your data to train their own models. True private AI will not share your data or use it to fine-tune public models in any way.

Private AI can operationalize AI without compromising data privacy.



AI has enormous potential to help modernize procurement, but acting too hastily could sabotage your results. You should take a deliberate approach when rolling out AI capabilities at your organization.

Define clear objectives for what you want AI to achieve.

You can't simply throw technology at a problem and expect all issues to be solved. AI is not a silver bullet. You have to think strategically about where AI can realistically add efficiency—where it can do things faster and better than a human worker.

Assess the quality, quantity, and accessibility of your data.

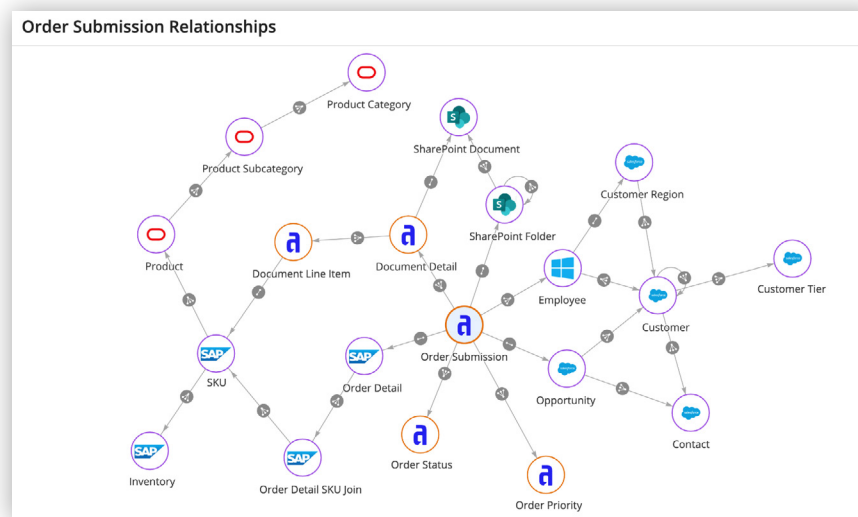
Data is the foundation upon which AI is built. Without access to diverse, relevant, and sufficient data, AI systems cannot learn, generalize, or adapt effectively. High-quality data ensures that AI systems learn accurate and reliable patterns. The quantity of data allows AI models to identify subtle patterns and trends that might be missed with smaller datasets.

But having the best data in the world doesn't help if the AI systems can't access it. Use a data fabric to enable access to all data sources across your enterprise. A data fabric is an architecture layer and tool set that connects data across disparate systems and creates a unified view. Data fabric eliminates time-intensive and costly data migrations, connecting data directly from wherever it lives, giving you the ability to spin up applications and make data-driven decisions faster.



Fundamental to every AI problem is data. When we talk about how prepared organizations are, a driving force will be the maturity of their data ecosystem.

Brendan McElrone, Managing Director, Deloitte Consulting in the 2024 AI Outlook¹



Invest in the right tools to support AI development and deployment.

Cultivate a supportive framework that includes clear policies, guidelines, and ethical standards. Then, select the appropriate tools for implementing AI into government procurement processes to ensure seamless integration, efficiency, and sustained success.

The flexibility of the low-code Appian Platform and its focus on process automation makes it easy to incorporate AI processes into Appian workflows and update them as needed. This ensures that AI deployment remains adaptable and responsive, evolving with the changing landscape of government procurement. The choice of a tool like Appian becomes instrumental in creating a harmonious synergy between AI, data, processes, and continuous improvement, ultimately enhancing the effectiveness of human workers and government procurement initiatives.

Prepare your workforce for AI adoption.

Develop effective communication strategies to ensure that all stakeholders are aware of the changes AI will bring to the procurement process and the benefits it offers. Offer comprehensive training programs that equip employees with the necessary skills to work alongside AI systems and understand their capabilities and limitations.

Be sure to address concerns about job displacement. Emphasize that AI is intended to augment, not replace, human roles—to handle the monotonous, routine tasks that human workers don't want to perform so they can focus on the more strategic, valuable parts of their jobs.

By fostering a culture of continuous learning, transparency, and collaboration, government agencies can ease the transition to AI adoption and empower their workforce to embrace AI as a valuable tool for enhanced efficiency and responsible procurement practices.



AI projects can fail. In fact, most AI projects fail because they lack the right governance and the right data.

Piyush Kumar, Global Head – Strategy, Strategic Partnership & Solutions, WiPro in the 2024 AI Outlook¹



Start small and scale slowly once successful.

Incorporating AI into government procurement should begin with a cautious and deliberate approach. It's essential to start small, selecting specific use cases or areas within the procurement process where AI can provide immediate value.

Once these initial AI implementations prove successful, gradually scale. Monitor, evaluate, and adjust as needed to maximize benefits. Assess the impact of AI on efficiency, transparency, and compliance while also scrutinizing any potential ethical or legal issues. This ongoing evaluation allows for adjustments to be made as needed, ensuring that AI integration maximizes benefits without compromising fairness or accountability in procurement.

This iterative approach not only minimizes risks but also ensures that AI-driven enhancements align with the government's objectives, resulting in a more responsible and effective procurement ecosystem.



Start with the basics—give teams enough time and resources to experiment. Fail fast, adapt, and re-experiment. That's the best way to learn. Also, give employees enough time for theoretical and practical training.

Piyush Bothra, Field CTO, Principal Solutions Architect,
Amazon Web Services, in the 2024 AI Outlook¹



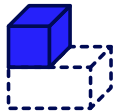
What to look for in an AI solution.



Versatile AI technologies. Look for software that offers a wide range of AI technologies, ensuring the most suitable one is selected to solve specific problems effectively.



Data security. Seek a solution that enables the use of private AI to safeguard sensitive data, ensuring data security and compliance.



Adaptability to advancements. Opt for a solution that can quickly adapt to new AI advancements, preventing you from being locked into today's AI capabilities and ensuring future relevance.



Seamless integration. Choose software that seamlessly integrates AI into your existing applications, avoiding creating isolated AI silos and enabling a frictionless user experience.



Development environments. Prioritize products that provide test and play capabilities for AI in lower environments, helping you experiment and refine AI applications before deploying them in production.



Industry expertise. Seek out companies with a proven track record of working within your specific industry. They will better understand your unique challenges and requirements and how best to apply AI.

Appian offers the only modern, low-code government acquisition and eProcurement solutions designed for government departments and agencies. The applications integrate with each other to provide a complete, end-to-end procurement solution.

Appian incorporates versatile AI technologies into its integrated government procurement solutions while maintaining security and mitigating risk through its private AI model. Built using a composable architecture, the solutions are easily customized to your needs.

Request a demo to see how Appian infuses AI throughout the procurement lifecycle to streamline your process.

**Learn more at appian.com.
Contact info@appian.com.**

1. [The 2024 AI Outlook](#).



Appian is a software company that automates business processes. The Appian AI Process Platform includes everything you need to design, automate, and optimize even the most complex processes, from start to finish. The world's most innovative organizations trust Appian to improve their workflows, unify data, and optimize operations—resulting in better growth and superior customer experiences. For more information, visit appian.com. [Nasdaq: APPN]

