

Use of New and Innovative Technologies in Public Procurement

e-GP

GenAI

Blockchain

RAP

IoT

Big Data

AI

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Agenda Items



- Understanding the potential of technology
- Real-world examples
- Q&A

Challenges in Procurement Landscape

The Evolving Landscape	Challenges in Traditional Procurement
<ul style="list-style-type: none">• Growing regulatory burdens• Increasing supplier base• Rising costs and inefficiencies	<ul style="list-style-type: none">• Manual processes• Lack of transparency• Inefficient supplier management• Limited data analysis

Role of Technology in Procurement Landscape

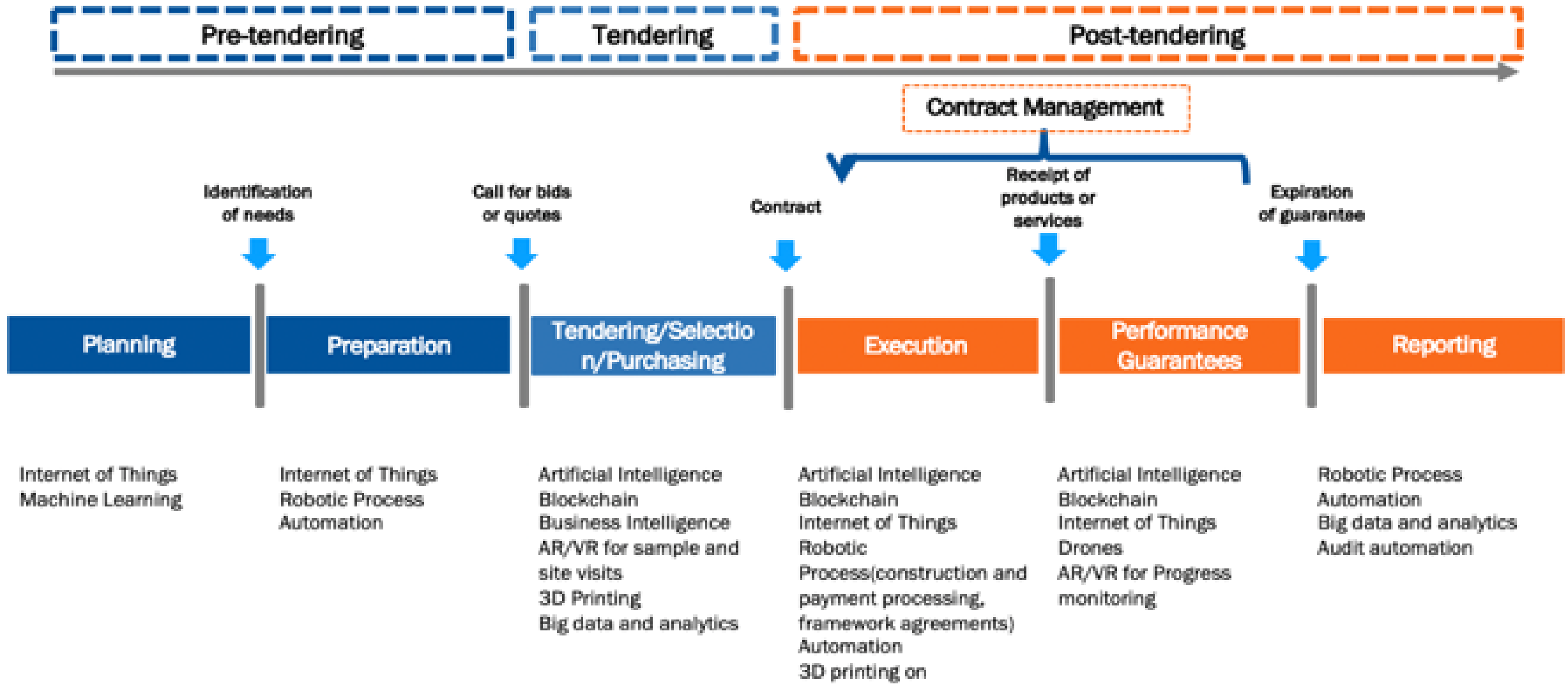
- Automation and efficiency
- Enhanced transparency and accountability
- Improved decision-making
- Risk mitigation

Innovative Technologies

1. Artificial Intelligence (AI) & Machine Learning (ML),
2. Generative AI
3. Robotic Process Automation (RPA)
4. Blockchain
5. Internet of Things (IoT)
6. Big Data



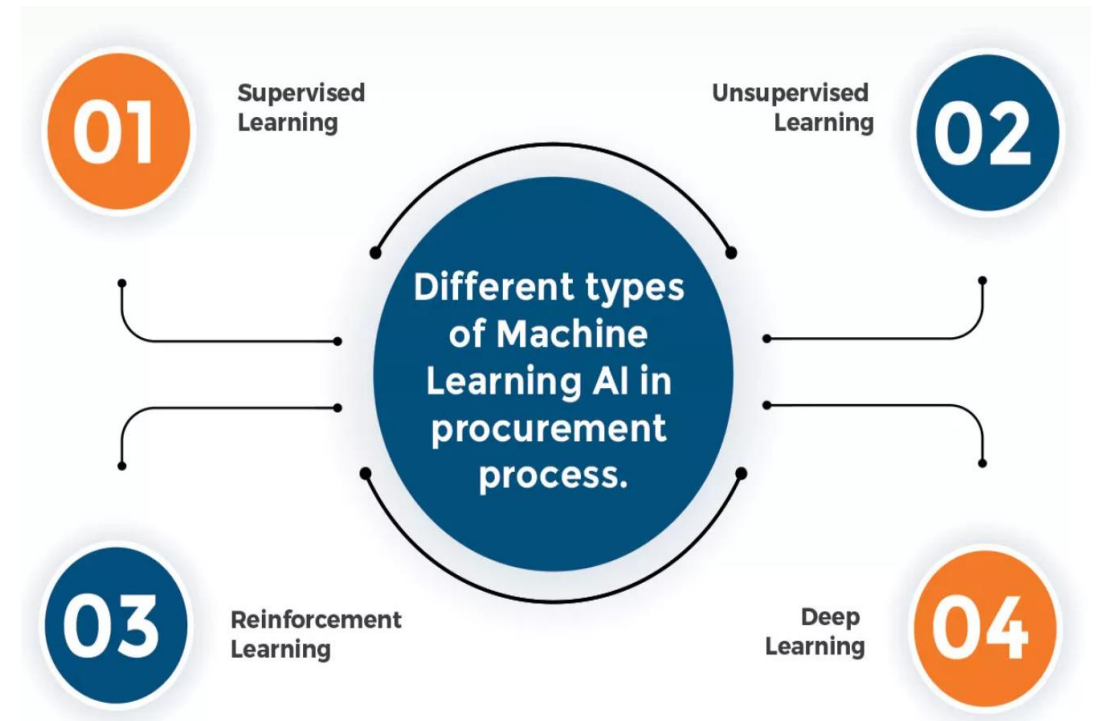
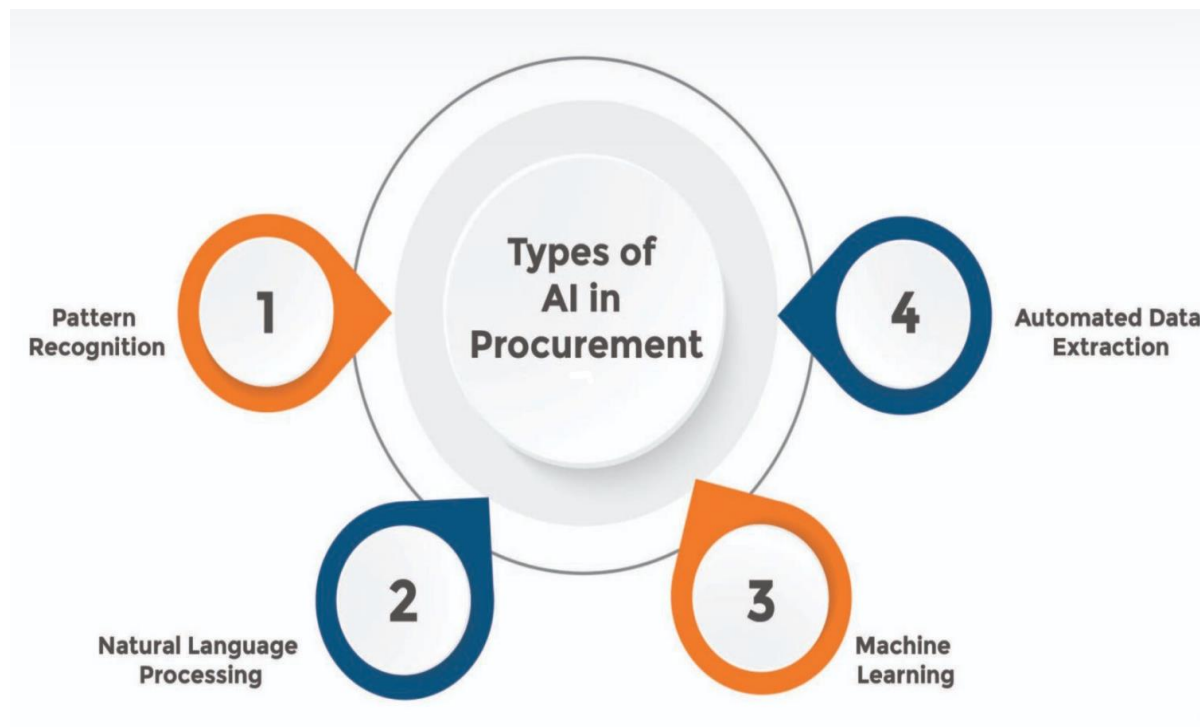
Public Procurement Process and Emerging Technologies



Innovative Technologies

Artificial Intelligence in Public Procurement

Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems.



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AI in Public Procurement

- **Example:** The City of Philadelphia used IBM Watson to analyze procurement data and identify cost-saving opportunities in the purchase of office supplies. This led to a 10% reduction in spending.
- **Example:** The UK government has experimented with AI-powered chatbots to answer supplier queries, reducing the workload on procurement staff and improving response times.

ML in Public Procurement

- **Example:** The Australian government used machine learning to predict the likelihood of supplier default based on historical data, allowing for proactive risk management.
- **Example:** The City of New York employed ML algorithms to optimize the timing of bids, resulting in significant cost savings on construction projects.
- **Sourcing:** AI can analyze vast datasets of supplier information to identify potential suppliers, assess their performance, and predict future behavior.
 - *Example:* The City of London used AI to analyze supplier data and identify new, innovative suppliers for a smart city project.
- **Contract Management:** AI can extract key clauses from contracts, identify potential risks, and automate routine tasks like contract renewals.
 - *Example:* The Australian government implemented AI-powered contract analysis to reduce contract review time by 50%.

ML in Public Procurement

- **Demand Forecasting:** ML algorithms can analyze historical data to predict future demand for goods and services, optimizing inventory levels and preventing stockouts.
 - *Example:* The state of California used ML to forecast demand for medical supplies during the COVID-19 pandemic, ensuring timely distribution.
- **Fraud Detection:** ML can identify anomalies in procurement data, such as suspicious spending patterns or vendor fraud, helping to prevent financial losses.
 - *Example:* The UK government used ML to detect fraudulent invoices, saving millions of pounds.

Generative AI



Generative AI is a disruptive machine-learning algorithm that learns about content from data and uses it to produce creative, realistic, completely new outputs.

It is not a technology that works only in a world with a lot of data, which data-driven AI is good at; it can create new things from a small amount of information and can be used in various fields and for various applications

It can generate:

- **Art and design** (OpenAI's DALLE2, Midjourney and Stable Diffusion)
- **Music** (AIVA and SOUNDRAW)
- **Text** (Gemini, ChatGPT)
- **Speech**

Innovative Technologies

Generative AI

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

Innovative Technologies

Robotic Process Automation (RPA)



Automation of Tasks

RPA automates repetitive and rule-based tasks, freeing up procurement professionals to focus on higher-value strategic activities.



Efficiency Gains

Implementation of RPA can dramatically enhance processing speeds and accuracy in procurement workflows, leading to faster turnaround times.



Cost Reduction

By decreasing the need for manual intervention, RPA allows organizations to significantly lower operational costs associated with procurement processes.



Practical Use Cases

Examples of RPA in action include automated vendor onboarding, invoice processing, and compliance checks, showcasing the benefits of this technology.

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Robotic Process Automation (RPA)

- **Invoice processing:** Automatically extract data from invoices, verify information, and create payment requests.
- **Purchase order creation:** Generate purchase orders based on approved requisitions, reducing manual effort.
- **Document routing:** Automatically route procurement documents (e.g., contracts, purchase orders) to appropriate stakeholders for approval.
- **Supplier onboarding:** Automate the collection and verification of supplier information.
- **Supplier performance evaluation:** Collect and process supplier performance data for analysis.
- **Contract management:** Manage contract renewals, expirations, and modifications.
- **Data extraction:** Extract data from various systems for reporting and analysis purposes.
- **Report generation:** Create standard procurement reports automatically.
- **Data validation:** Verify data accuracy and consistency.
- **Tendering process:** Automate repetitive tasks in the tendering process, such as document preparation and submission.
- **Contract compliance:** Monitor contract compliance and generate alerts for potential breaches.

By automating these tasks, RPA frees up procurement professionals to focus on strategic activities, such as supplier relationship management, risk assessment, and innovation.

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Blockchain

Blockchain is a secure, transparent ledger that records transactions across multiple computers. In procurement, it ensures data integrity, tracks the supply chain, and enables smart contracts. It's the foundation for trust in digital procurement.

- **Supply Chain Transparency:** Blockchain can track the entire supply chain, ensuring ethical sourcing and compliance with regulations.
 - *Example:* The Norwegian government used blockchain to trace the origin of seafood products, ensuring sustainability and preventing illegal fishing.
- **Smart Contracts:** Automated contract execution based on predefined conditions can streamline procurement processes and reduce errors.
 - *Example:** The Dubai government is exploring blockchain-based smart contracts for procurement, aiming to reduce paperwork and accelerate contract execution.
- **Blockchain technology offers unprecedented transparency and traceability in supply chains. By creating an immutable record of transactions, we can combat fraud, ensure ethical sourcing, and build trust with stakeholders.**

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Internet of Things (IoT)

The Internet of Things (IoT) enables real-time monitoring and management of assets. By collecting data from connected devices, we can optimize asset utilization, reduce downtime, perform predictive maintenance and achieve significant cost savings.

- **Asset Management:** IoT sensors can monitor the condition of assets, optimizing maintenance schedules and extending equipment lifespan.
 - *Example:** The city of Barcelona deployed IoT sensors to monitor the condition of streetlights, reducing energy consumption and maintenance costs.
- **Supply Chain Visibility:** IoT devices can track the movement of goods, improving supply chain visibility and responsiveness.
 - *Example:** A major logistics company uses IoT to monitor the location and condition of shipments, reducing delivery times and improving customer satisfaction.
- **Monitoring:** The city of Copenhagen uses IoT sensors to monitor the condition of public buildings, optimizing maintenance schedules and reducing energy consumption.
- **Conditions:** The transportation sector is leveraging IoT to track the location and condition of vehicles, improving asset management and reducing costs.
- **Monitor Energy Consumption:** The City of Amsterdam has deployed smart streetlights equipped with IoT sensors to monitor energy consumption, optimize maintenance schedules, and reduce costs.

Innovative Technologies

Big Data

Big data analytics empowers procurement professionals with data-driven insights. By analyzing vast amounts of data, we can optimize procurement strategies, forecast demand accurately, and identify cost-saving opportunities.

Big Data Analytics for Procurement Decision-Making



Diverse Data Sources

Public procurement generates vast amounts of data from various sources, including suppliers, market trends, and user feedback, forming a foundation for analytics.



Performance Metrics

Analytics tools provide key performance indicators, enabling organizations to assess procurement effectiveness and implement continuous improvements.



Insights Generation

Leveraging big data allows procurement teams to uncover hidden insights, optimize supplier selection, and forecast budgets with greater accuracy.



Real-world Use Cases

Global organizations have successfully utilized big data analytics for data-driven decision-making, impacting sourcing strategies and supplier performance evaluations.

Innovative Technologies

Technologies facilitating Sustainable Procurement

Sustainable Public Procurement and Green Procurements are crucial in public procurement. Therefore, it is important to develop platforms and processes to enable sustainable operations and simplify carbon accounting. Such platforms should provide manufacturers with greener alternatives for raw materials, emission-free delivery channels, biodegradable packaging, etc.

At the same time, other platforms should support carbon emission tracing and supply chain compliance management.

A few advanced countries are already leveraging procurement analytics, spending audits, and category management to reduce sourcing carbon footprint while maintaining profitability. Sustainable sourcing and procurement is also an important goal of social responsibility to bring transparency to the supply chain.

- There are already available a procurement intelligence platform that mitigates environmental, social, and governance (ESG) concerns in public procurement. The available AI module combines internal financial data with supplier and market data to deliver intelligence at the point of purchase. It also features real-time predictive insights, dynamic specification enhancement and matching, comparative procurement scenarios, and sentiment analysis. Using these features, entities reduce budget wastage, optimize procurement, and receive decision support for sustainable and inclusive procurement.

Innovative Technologies

Big Data

Big data is the fuel for modern procurement. It's vast amounts of structured and unstructured information that, when analyzed, provides invaluable insights. It's the raw material for data-driven decisions.

Data analytics transforms raw data into actionable intelligence. In procurement, it helps uncover cost-saving opportunities, optimize supplier performance, and identify risks. It's the tool that turns data into value.

- **Spend Analysis:** Analyzing procurement data can identify spending patterns, detect cost-saving opportunities, and optimize supplier relationships.
 - *Example:* The UK government used big data analytics to identify duplicate spending and consolidate suppliers, resulting in significant cost savings.
- **Risk Management:** By analyzing supplier performance and market trends, organizations can identify potential risks and develop mitigation strategies.
 - *Example:* A large manufacturing company used big data to predict supply chain disruptions and implement contingency plans.
- **Pattern identification:** The Dutch government analyzed large datasets of procurement data to identify spending patterns and optimize purchasing decisions, leading to significant cost savings.
- **Optimize supply chain:** The UK Ministry of Defence used big data analytics to optimize its supply chain, reducing stock levels and improving delivery times.

AI-Enabled e-Government Procurement (AI-GP)



AI-enabled e-GP refers to the integration of artificial intelligence (AI) technologies into electronic government procurement (e-GP) processes to enhance efficiency, transparency, and decision-making. It involves leveraging AI capabilities for endless possibilities such as machine learning, natural language processing, content generation, digital assistant, and data analytics to automate tasks, optimize processes, and extract valuable insights from procurement data (Shakya, 2024).

Building a Technology-Enabled Procurement Ecosystem



- Collaboration and partnerships
- Integration of systems and data
- Standardization and interoperability
- Creating a digital procurement ecosystem

Unleashing the Potential of Innovative Technologies

Potential of AI



- Let's recap the key benefits of technology in public procurement: increased efficiency, transparency, cost savings, and improved decision-making. By embracing innovation, we can transform procurement into a strategic advantage.
- It's time to embrace innovation and revolutionize public procurement. Let's work together to build a more efficient, transparent, and sustainable procurement ecosystem.
- Technology is not a replacement but a powerful partner: It augments human expertise and capabilities.

Thank you

Q&A