

Digital Continuous Improvement: Value Creation at the Intersection of Smart Automation and Advanced Analytics

By Erik Dorr, Paul Morrison and Jimmy LeFever

Executive Summary

Procurement organizations have a compelling motive for advancing toward a vision of smart, efficient, digitally enabled operations. The Hackett Group's recent research finds that world-class procurement organizations that fully optimize their technology architecture and embrace smart automation technologies can realize a productivity advantage of up to 68%, compared to typical procurement functions (or the peer group). However, attaining digital world-class performance like this remains a challenge for most. To do so, procurement organizations will need to navigate the complex process of establishing highly interdependent digital capabilities. One specific opportunity to create value occurs at the intersection of smart automation and advanced analytics. This particular combination of digital capabilities can create a continuous improvement cycle that enables value capture throughout the life cycle of automated processes. From our observation, the combination of smart automation, analytics and digital continuous improvement represents the next frontier of value creation in procurement's digital transformation journey.

Imagining the possible

Fully enabled by modern digital technologies, the procurement function of 2025 will deliver greater value to the organization by:

- Aligning and integrating its operations closely with the broader supply chain.
- Eliminating rule-based, routine transactional processes such as accounts payable and purchase order processing.
- Automating routine, process-based roles, such as supplier onboarding, enabling it to focus only on more strategic activities.
- Using cognitive capabilities to predict activities, suggest opportunities and recommend strategy.
- Using data and advanced analytics to increase compliance, enabling realized savings to fall to the bottom line.
- Decreasing the rate of head count growth and bringing knowledge-based roles to the forefront of its talent needs.
- Employing smart engines to predict disrupting events to the supply chain, allowing the organization to better plan for and limit disruptions.

Advanced analytics defined

Advanced analytics is the analysis of data and the design, development and deployment of analytical models using sophisticated techniques and tools, typically used in predictive and prescriptive analytics use cases. Advanced analytics techniques include visual analytics, data mining, big data analytics, clustering analysis, machine learning, deep learning and neural networks.

These capabilities will enable procurement to dramatically improve process efficiency and effectiveness, as well as the experience of stakeholders. As a result, it will be able to respond more rapidly to changing business requirements and deliver the timely insights that management, managers, employees and recruits expect. This way, it will not only reduce its own operating cost, but also fulfill its aim to become a strategic advisor to the business.

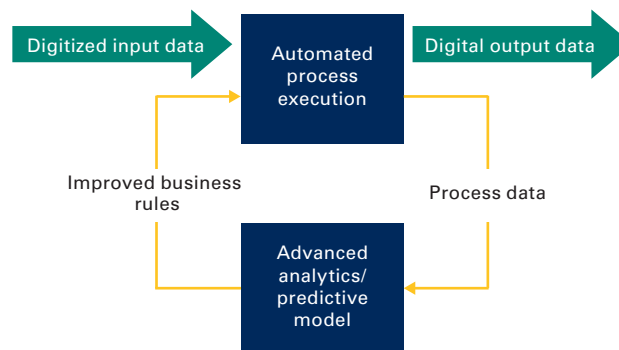
Smart automation, analytics and digital continuous improvement

This report focuses on two capabilities that are at the leading edge of procurement digital transformation: smart automation (see sidebar, “Smart automation defined”) and advanced analytics (see sidebar, “Advanced analytics defined”) – both play a critical role in achieving the procurement function of 2025 profile described earlier. Common themes in the profile are automated, adaptive and self-learning. Developing these capabilities, therefore, requires looking beyond current business application platforms, best-of-breed point solutions and traditional analytics tool sets.

Recent technology use cases and emerging digital best practices reveal clear improvement opportunities based on employing traditional automation in conjunction with advanced analytics and smart automation tools. Why? Automated processes are a continuous source of process performance data. This data is the lifeblood of analytics; the higher the quality, volume and variety of data sources, the more valuable the resulting analysis.

Automated execution of work produces new digital data, so the amount of raw information available for analytical purposes is growing exponentially. The ability to mine this data for business insight and build predictive models (i.e., advanced analytics) results in better business rules for process execution, leading to operational performance improvement. The Hackett Group calls this “digital continuous improvement” (Fig. 1).

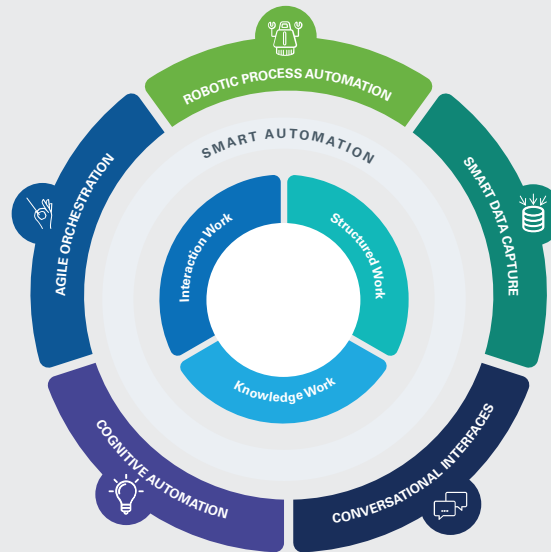
FIG. 1 Digital continuous improvement








Smart automation defined

The Hackett Group defines smart automation as a business capability that optimizes execution of structured, knowledge and interaction work through deployment of five specific technologies (Fig. A).

FIG. A The Hackett Group's Smart Automation Framework



Smart automation technology	Description	Example
Robotic process automation 	Robotic process automation (RPA) mimics human system interactions.	Robot reads invoice data from one system and posts the transaction in the enterprise resource planning system.
Smart data capture 	Smart data capture mimics extraction, conversion and interpretation of data.	Automation reads and classifies unstructured supplier documents as part of the supplier relationship management (SRM) process in hundreds of different formats.
Conversational interfaces 	Conversational interfaces mimic human interaction.	Virtual agent receives and responds to requisition queries and guides user to the appropriate buy channel, thus reducing the potential for maverick spend; responds to budget, quality and quantity limitations, inventory on file, etc.
Cognitive automation 	Cognitive automation emulates human cognition and augments human intelligence.	Pattern-recognition tools identify anomalous contract terms and assess contract risk, assess supplier risk and supply event risk, and identify regulatory changes and compliance and assess impact. Predictive modeling tools generate more accurate risk event likelihood and contingency strategies in a shorter period of time.
Agile orchestration 	Agile orchestration coordinates execution of work.	Platform monitors sourcing events, requisitions, SRM initiatives, and invoice receipt, and then adjusts the pace of data capture and RPA activity when exception volume exceeds a level that resources cannot handle.

A new digital world class

The Hackett Group's extensive benchmarking data and digital expertise enables us to quantify, for the first time, the magnitude of the productivity and efficiency improvement potential of employing smart automation. Typical procurement functions (or in our terminology, the peer group, or simply, peers) can execute work with 25% fewer full-time equivalents and at 17% lower cost by adopting smart automation. Furthermore, by moving beyond smart automation to optimize and rationalize the entire technology environment, these organizations have an opportunity to improve productivity by as much as 55%.

World-class procurement organizations that deploy smart automation technologies to execute work that is already highly technology-intensive may find themselves positioned to realize a digital world-class productivity advantage of up to 68%. The full transition from peer group to digital world-class performance extends the opportunity to reduce cost by up to 55% over the current peer baseline.

By creating a feedback loop that leverages intelligent process automation (i.e., using analytics to mine process data), procurement can implement a continuous improvement approach that significantly expands the potential for what can be achieved. This in turn raises the bar for world-class performance in a digital world (see sidebar, "A new digital world class").

Digital continuous improvement creates new value opportunities

Procurement organizations making the business case for technology enablement should base it on the full life cycle of value-creating opportunities – both initial and ongoing improvement benefits. By their very nature, future benefits are difficult to quantify. Nonetheless, procurement executives should look for use cases that exploit the value at the intersection of smart automation and advanced analytics and develop scenarios to quantify the value of continuous improvement. Following are four examples:

- **Supplier onboarding:** Procurement uses a combination of smart automation and analytics to take much of the manual effort out of supplier onboarding and screening, document collection, creation of supplier composite risk scores, supplier selection, and other supplier setup procedures.
- **Contract life cycle management:** Procurement uses smart automation and advanced analytics to automate document workflow and retention. In addition, this combination enables intelligent risk assessments and automated notifications of out-of-compliance contracts and/or expiring contracts/renewals – insights that help the organization identify opportunities to improve contracts.
- **Sourcing events:** Procurement uses analytics-driven market intelligence, such as tariff changes or otherwise fluctuating market conditions, as input for automating sourcing event creation and workflow.
- **Guided buying:** By combining market intelligence from advanced analytics with the use of a cognitive tool, procurement steers buyers through an advanced guided buying process that takes into account factors such as supply chain disruptions. For example, X may be a preferred buying channel, but it is experiencing a hurricane. Instead, the company will spend a little more to go through Y in order to receive the product days or weeks sooner. Advanced analytics can also help predict buying behaviors and, thus, needed items or services, thereby shortening the guided buying process and increasing stakeholder satisfaction. Combining the previous two use cases, the tool also suggests making regular purchases earlier or later based on price fluctuations.

Understanding and employing smart automation

Digitized data flows and smart automation are at the core of the digital continuous improvement cycle described in this report. Smart automation technologies fully digitize data flows, allowing for the capture and processing of data in order to feed advanced analytical models. Procurement functions must be able to identify and pursue the highest-value smart automation and digital continuous improvement opportunities. This requires detailed analysis of three types of procurement work to determine which aspects can be automated, as well as modeling the corresponding cost and labor savings opportunity.

Once procurement identifies the right technologies to automate different types of work, it can aggregate the information to estimate total smart automation potential by process, e.g., requisition and purchase order processing, supplier scheduling, or receipt processing. This approach focuses on analyzing procurement work, whereas traditional approaches have looked for opportunities to automate procurement roles. Analysis of procurement work and suitability for smart automation should include current state assessment and opportunities for continuous performance improvement. The latter has the further advantage of being able to analyze the data that is consumed and generated by execution of the work. This data can then be applied to sophisticated models that can yield the progressive improvement of process execution business rules.

Advanced analytics in action at Vodafone

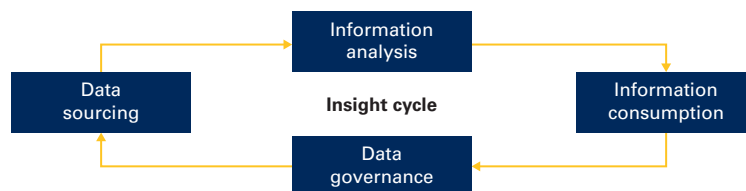
To eliminate inefficiencies in its massive purchasing operations, Vodafone built the Supply Chain Management (SCM) Control Centre to bring full transparency into how the procurement process is actually functioning. The SCM Control Centre works as an “X-ray big data machine,” which uncovers hidden inefficiencies in less than 10 seconds. This out-of-the-box analytics tool enables more than 600 members of Vodafone’s SCM organization to identify focus areas where it can employ advanced analytics, AI, and predictive modeling capabilities to improve efficiency and compliance levels. This digital solution already had reduced the time to market by 20% and yielded cost savings of 11%.

Type of work	Sample use cases
Structured work	<ul style="list-style-type: none"> • Approve and process purchase requisitions • Create required purchase order or blanket contract documentation • Track shipments • Set up catalog • Maintain supplier master file
Knowledge work	<ul style="list-style-type: none"> • Identify spend data source • Develop and maintain global, national, regional and local spend category sourcing strategies • Conduct commodity segmentation analysis • Perform cost/benefit analysis to support make/buy decisions • Identify strategic raw materials, components, assemblies and services
Interaction work	<ul style="list-style-type: none"> • Communicate and enforce company goals and objectives to internal and external stakeholders • Negotiate terms with suppliers • Conduct procurement staff performance reviews • Review procurement budgets, plans or forecasts with stakeholders • Mentor procurement staff

The role of advanced analytics in the digital continuous improvement cycle

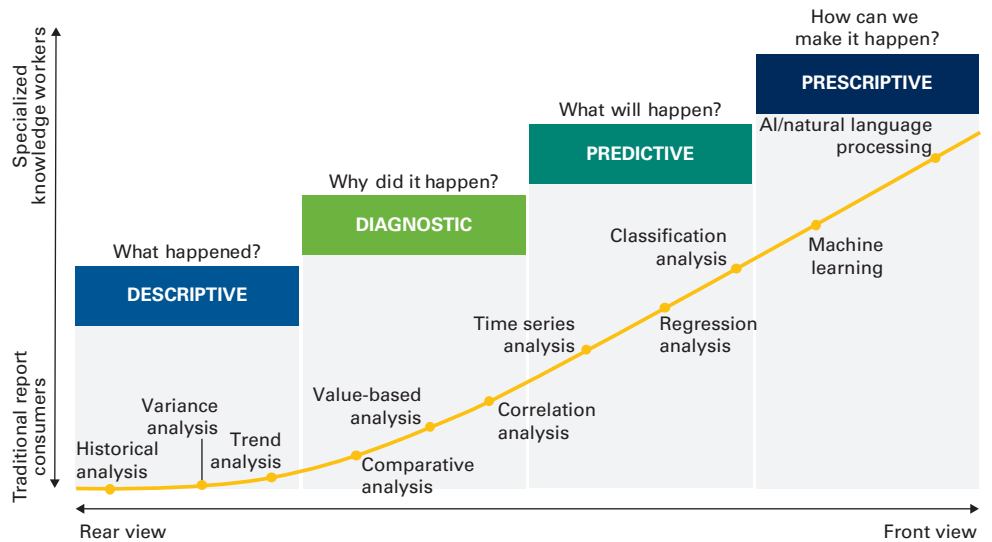
The ability to convert data into insight is the foundation for all digital procurement business capabilities. **Fig. 2** demonstrates how procurement can leverage data to deliver insights to stakeholders and then extract the resulting information, cleaning and preparing it for use in further analysis. This ongoing conversion of data into insight not only makes data curation and management more efficient, it also enables procurement to more effectively leverage valuable new sources of information to improve the effectiveness of the process for insight generation.

FIG. 2 Insight cycle



Traditionally, procurement teams used descriptive and diagnostic analysis methodologies to understand what happened and why. However, more of them are starting to include predictive and prescriptive analysis, which not only tells executives what happened and why, but what is going to happen, and how to either accelerate or mitigate it, as appropriate (**Fig. 3**). Predictive and prescriptive analytics employ advanced statistical algorithms and methods (e.g., multivariate statistics and data mining) and AI-based technologies such as machine learning, neural networks and deep learning. These sophisticated methods enable a fine-grained level of analysis of diverse and unstructured datasets, producing insight that was previously beyond the reach of analysts. More advanced analytic approaches don’t supplant traditional methodologies; they supplement them. In the future, procurement teams will select from a portfolio of techniques, based on specific needs and objectives.

FIG. 3 Analytics maturity model



The development of procurement’s advanced analytics capabilities depends on the availability of use cases showing an economic return, as well as the procurement organization’s ability to commit resources to implement the technology and develop analytic models. As smart technology matures and procurement organizations negotiate the learning curve, the number and variety of use cases will expand. **Fig. 4** offers a sampling of these for a variety of analytical domains.

FIG. 4 Advanced analytics procurement use cases

Analytics domain	Examples of procurement advanced analytics use cases
Spend analysis	<ul style="list-style-type: none"> • Provide additional insights into spend analysis beyond traditional methods, allowing organizations to look well beyond channel allocation to identify those most successful for optimizing tail spend. • Allow program shifts among buying channels to ensure stakeholder satisfaction, best price and delivery and, above all, on-contract spend.
Risk assessment	<ul style="list-style-type: none"> • Use predictive analytics to assess supplier vitality, compliance and likelihood of fulfilling future orders, thereby improving supplier risk mitigation.
Market intelligence	<ul style="list-style-type: none"> • Use cognitive algorithms and analytics to predict geopolitical, weather-related or other supply chain disruptions, thereby improving contingency planning and mitigating disruptions.
Sourcing savings	<ul style="list-style-type: none"> • Combine market category intelligence with predictive analytics to improve planning for market price fluctuations, thus allowing the organization to take advantage of price lows.
Contract and policy compliance	<ul style="list-style-type: none"> • Combine advanced and predictive analytics with smart automation to scan contracts intelligently and search for potential threats in contract language with far greater efficiency than human review.

Taking action

Optimizing the value and potential of digital continuous improvement requires that procurement organizations develop new capabilities as part of a digital transformation strategy that aligns with the overall business strategy. Below are steps that will help procurement organizations begin to create value by combining smart automation with advanced analytics.

1. Employ a comprehensive, full life cycle framework to guide planning to ensure that critical interdependencies are considered.
2. Use established diagnostic tools to produce an objective assessment of current capabilities to pinpoint areas of greatest need and opportunity.
3. Benchmark performance externally with other procurement organizations to quantify opportunities and develop realistic targets for improvement.

4. Analyze elements of work – rather than roles – when building use cases for smart automation and advanced analytics. Factor in the value of digital continuous improvement. Obtaining maximum impact from these business capabilities requires redefining – rather than simply eliminating – roles as smart automation and advanced analytics are deployed.
5. Prioritize the acquisition and development of acumen in areas such as data science, social media, strategic thinking, design thinking, customer experience and process excellence. These skills are essential for successful deployment and use of smart automation and advanced analytics.
6. Tap established expertise, at least in the early stages of transformation. Initially, procurement may lack the kinds of skills required to deploy smart technology while also handling day-to-day responsibilities. Working with experienced advisors, such as the IT organization or an analytics center of excellence, can help accelerate transformation.

About the authors

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Erik Dorr has over 20 years of experience in consulting, research and advisory roles in IT strategy, enterprise application suites and business process reengineering. Before being named to his current position, Erik was senior enterprise research director. Prior to joining The Hackett Group, he held numerous senior management positions, including vice president of IT at a global manufacturing company, where he was also a member of the executive leadership team.

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Paul Morrison leads the smart automation practice at The Hackett Group. His work helps clients maximize the benefits of RPA and cognitive automation, often as part of a larger digital transformation. This includes the development of RPA strategy and pilots, and live implementation, based on The Hackett Group's Smart Automation Framework. Paul has 20 years of advisory experience, extending beyond automation and into benchmarking, innovation and outsourcing, and covering both IT and business processes. Based in London, he works with clients across Europe and globally.

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In addition to conducting research on topical subjects, Jimmy LeFever advises clients as they work to optimize their processes, organization and technology (both on-premises and cloud-based). His subject matter expertise includes sourcing, contract management, procure-to-pay, order-to-cash, payments, and travel and expense management. Before joining The Hackett Group, he was director of research and consulting at PayStream Advisors.

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