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**The Future of Procurement in
the Age of Digital Supply Networks**

Procurement on the verge of change

Rapid advancements in digital technologies are remaking business supply chains, and are poised to transform how the procurement function delivers value. Low-cost computing and data storage have enabled advancements in mobile technology and the cloud, constant connectivity is the norm, and sensors bring devices and machines to life in the Internet of Things.

The application of these disruptive technologies to procurement is already fundamentally altering the impact of this function. Strategic sourcing is becoming more predictive, transactional procurement is becoming more automated, and supplier relationship management is becoming more proactive.

Digital procurement solutions are enabling this future by providing access to previously unavailable data, or bringing order to massive (but unstructured) data sets; driving more complex analysis and better supplier strategies; and enabling more efficient operations.

For organizations looking to embrace digital solutions, the path has never been easier. Many of these emerging technologies work to enhance the value of legacy systems, involve minimal investment, have low requirements for integration, and have payback periods measured in weeks not months.

Defining digital procurement

Digital procurement is the application of disruptive technologies that enable Strategic Sourcing (S2C) to become predictive, Transactional Procurement (P2P) to become automated, and Supplier Risk Management (SRM) to become proactive (figure 1).

The possibilities are striking. Professionals in the Strategic Sourcing or Source to Contract (S2C) space—who worry about sourcing goods and services, selecting suppliers, and securing the best value and prices for their organizations—are already in a world in which it is possible to:

- Categorize and manage spend in real time, leveraging machine learning
- Predict demand with artificial intelligence
- Know landed cost for any commodity for all alternate countries of origin
- Predict future sources of supply
- Act on timely alerts from all negotiated agreements (e.g., indexed pricing, penalties, renewals) through smart contracts

The Impact: In the digital age, S2C becomes predictive, with supply bases, prices, and costs all visible, empowering professionals to reach transparent agreements with high-value suppliers.

Professionals in the Transactional Procurement or Procure to Pay (P2P) space—who enable operations, process transactions, and ensure goods and services are delivered and rendered—are now in a world in which it is possible to:

- Automatically sense material demand and requisition replenishment deliveries from suppliers
- Eliminate repetitive processing through robotic process automation
- Trigger payments utilizing real-time signals of material delivery
- Execute automated secure payments
- Exchange goods through validated and trusted decentralized ledgers

The Impact: P2P becomes automated in the digital world. Transactions (processing purchase orders, requisitioning goods and services, validating reception of materials, paying invoices, etc.) become routinized and require minimal human intervention.

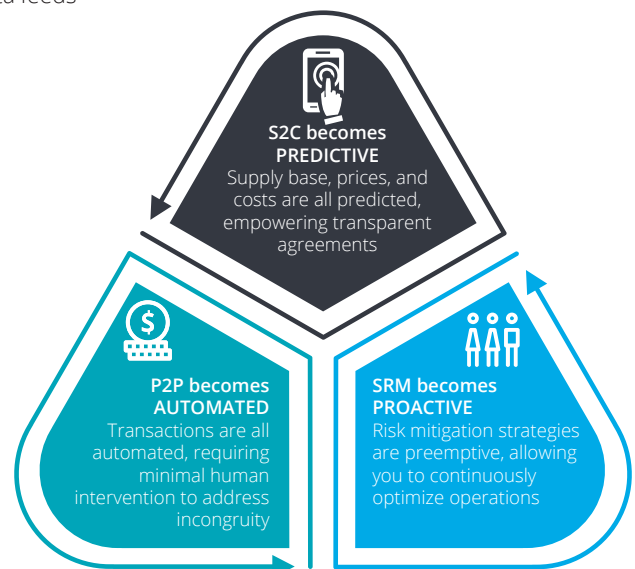
Finally, professionals in Supplier Relationship Management (SRM)—who develop strategies to increase the value of supplier relationships and mitigate risks—are in a world in which it is possible to:

- Monitor potential supplier risks in real-time through the aggregation and visualization of third-party data feeds
- Conduct supplier visits from their own office utilizing augmented reality
- Enhance supplier audits through crowdsourcing

The Impact: SRM becomes proactive, as risk mitigation strategies are now preemptive, allowing professionals to focus on continuously optimizing operations, as opposed of conducting damage control.

Leveraging better data from the S2C, P2P, and SRM processes, advanced analytics, increased computing power, and improved visualization technologies, digital procurement ultimately provides better evidence-based options for decision making and improve the accuracy of strategic decisions.

Figure 1: The characteristics of digital procurement



Digital Technologies and Capabilities

Procurement technologies are advancing rapidly, moving through a regular cycle from emerging, to maturing, until widely adopted as core (figure 2).

Most organizations deploy several forms of core procurement technologies. These platforms usually include a combination of spend analytics, eSourcing, contract management, and eProcurement (eCatalogs, eInvoicing), among others. The solutions are procurement mainstays for many organizations and will remain relevant for the foreseeable future.

These core systems have typically been characterized by deployments requiring healthy amounts of capital spending and significant of systems integration work.

In contrast, today's maturing and emerging solutions tend to be much quicker to deploy. Many use Software as a Service (SaaS) models, do not need significant preparation of data or systems, require no or light integration, and can produce results within days or weeks.

The following digital solutions and capabilities have entered the maturing phase; CPOs that have not already embraced them for competitive advantage should expect them to quickly become table stakes:

- **Cognitive computing and artificial intelligence:** Leverages pattern recognition software and iterative machine learning algorithms to rapidly categorize unstructured spend, cost, contract, and supplier data (e.g., information like raw AP records or T&E systems extracts not within the traditional structure of an enterprise resource planning system) to deliver new insights and opportunities.
- **Intelligent content extraction:** Uses Optical Character Recognition (OCR) and

learning algorithms to read unstructured documents such as PDFs of contracts, specification drawings, and Bills of Material, and rapidly extract critical pieces of data like pricing tables, payment terms, and termination clauses that would have taken days or weeks to assemble.

- **Predictive and advanced analytics:** Combines modeling, statistics, machine learning, and artificial intelligence with multiple third-party data sources to predict most likely scenarios for cost/price fluctuations, demand, supplier/country risks, etc. and enable proactive decision making.
- **Visualization:** Transforms data into user-friendly, executive-friendly, visual formats that can simplify decision making by organizing information and delivering fresh insights and recommendations.
- **Collaboration networks:** Platforms that provide buyers and suppliers with visibility into all elements of their joint value chains. Users can maintain supplier information in the cloud; measure, analyze, and manage supplier performance; uncover joint process improvement opportunities; and identify, monitor, and escalate supplier risks.
- **Crowdsourcing:** Through the capture of large and diverse inputs (e.g., data, sentiment) and usually leveraging mobile technology, organizations can monitor trends and events impacting supply chains and supplier performance.
- **3D printing:** Additive manufacturing, or 3D printing technology, can quickly make a physical object from a digital model by laying down (i.e., adding) layers of a material. Currently used mostly for rapid prototyping of goods, the technology has the potential to eventually eliminate some

kinds of stocking activities for low-volume items, replacing them with on-demand production. Rapid prototyping will become an integral part of the strategic sourcing process for direct materials.

- **Robotics:** As it relates to procurement, Robotics Process Automation is software that recognizes and learns patterns and can perform rule-based tasks. This process is used to automate multiple repetitive manual tasks (e.g., some P2P tasks), driving efficiency and reducing errors and risks in execution.

Four additional emerging solutions are expected to impact procurement in the future, and procurement leaders should be educating themselves and preparing for adoption:

- **Blockchain:** This cryptologic data structure uses a trusted peer-to-peer network to create digital transaction ledgers which can verify and validate transactions in the P2P process (or any other supply chain process) and then be used to trigger automated payment.
- **Sensors and wearables:** Devices that detect, capture, and record physical data. These devices can note the movement of goods and inventory levels for reordering, and enable audit tracking during site visits.
- **Cyber tracking:** Real-time tracking of online or physical activity can be used to provide proactive monitoring of supplier behavior and performance. When combined with third-party data, the technology can deliver trends and predictions on supplier (or supply chain) risks.

- **Virtual reality and spatial analytics:** Detecting events or changes of status using video, location data, or pattern analysis, and conducting supplier visits or audits can empower procurement professionals to do more with less.

As a stand-alone deployment, each of the solutions mentioned above brings additional value to procurement. However, organizations that combine multiple technologies and solutions could see the value of their deployments grow exponentially.

Given the pace of change, procurement leaders should take every opportunity to expose their organizations to these disruptive technologies and to consider their applicability within their own organizations.

Figure 2: Today's digital technologies, and the degree to which the capabilities are being deployed in procurement

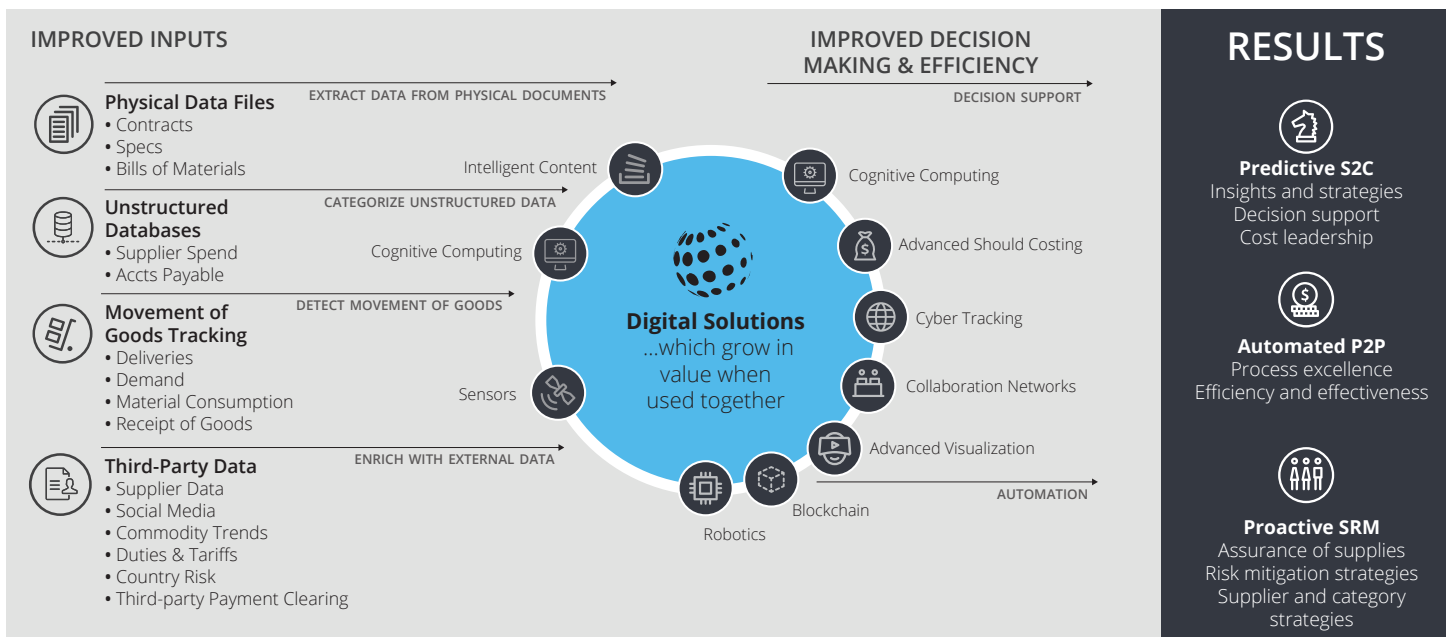


Bringing It All Together

Digital procurement solutions (figure 3) are allowing for many more physical and digital inputs to be connected, driving better decision making and improving efficiency, and ultimately producing results in the form of:

- Improved insights and strategies, leading to accelerated cost leadership
- Enhanced process excellence, leading to greater organizational efficiency and effectiveness
- Better assurance of supply and improved risk mitigation

Figure 3: Digital procurement capabilities work together to drive results



Improved Inputs

Many digital solutions are designed around providing access to previously unavailable data, or bringing order to massive (but unstructured) data sets. Examples include:

- *Thousands of files (e.g., contracts) in hard-copy or PDF form, preventing rapid access to detailed specs, negotiated T&Cs, indexed pricing, penalties, etc.:* An intelligent content extraction solution enabled by machine learning will convert static documents into data points for review and action.
- *Multiple, unstructured, and disparate sources of spend information:* A cognitive computing and artificial intelligence solution will read, interpret, and recognize the information procurement professionals require and will build a single, constantly refreshed source of supplier spend.
- *Demand, delivery, and consumption of raw materials:* All these changes can be captured through sensors that digitize the status and transaction of materials.
- *Third-party information (e.g., supplier data, commodity trends, social media, local media, duties and tariffs, country risk, and socio-political risk):* Multiple automated solutions utilize artificial intelligence to layer third-party data on to in-house data to support better sourcing and supplier strategies.

Improved decision making and efficiency

Digital procurement solutions are also driving more complex analysis, better supplier strategies, and more efficient operations. Some examples include:

- *Advanced analytics models that use large volumes of manufacturing and procurement data to generate cost-takeout and design improvement insights through visualization technology.*
- *Predictive analytics models that calculate total landed cost differences across products, country viability, country risk, and future-state forecasts by category and country.*
- *Cyber tracking and collaboration network capabilities which access real-time, relevant data across ecosystems and link physical events of the supply chain to information and action. These solutions help control, measure, and quickly respond to supplier or supply chain events.*

- *Blockchain solutions that can verify and validate transactions in the P2P process and can trigger automated payments.*
- *Robotics process automation solutions that deploy macro-like software and replicate tasks like processing information, interacting with ERP systems, and sending emails.*

Digital procurement solutions help procurement organizations generate new insights and strategies to uncover new sources of value, increase efficiency and effectiveness to achieve process excellence, and deliver assurance of supply and successful risk mitigation.

The digital journey

Digital procurement and legacy systems

With so many digital procurement solutions coming online, many procurement leaders struggle to determine their strategy in light of other legacy investments they have already made.

Regardless of the current state, core, emerging and maturing capabilities will continue to work together for the foreseeable future. The good news is that many of the maturing and emerging solutions “meet you where you are” in

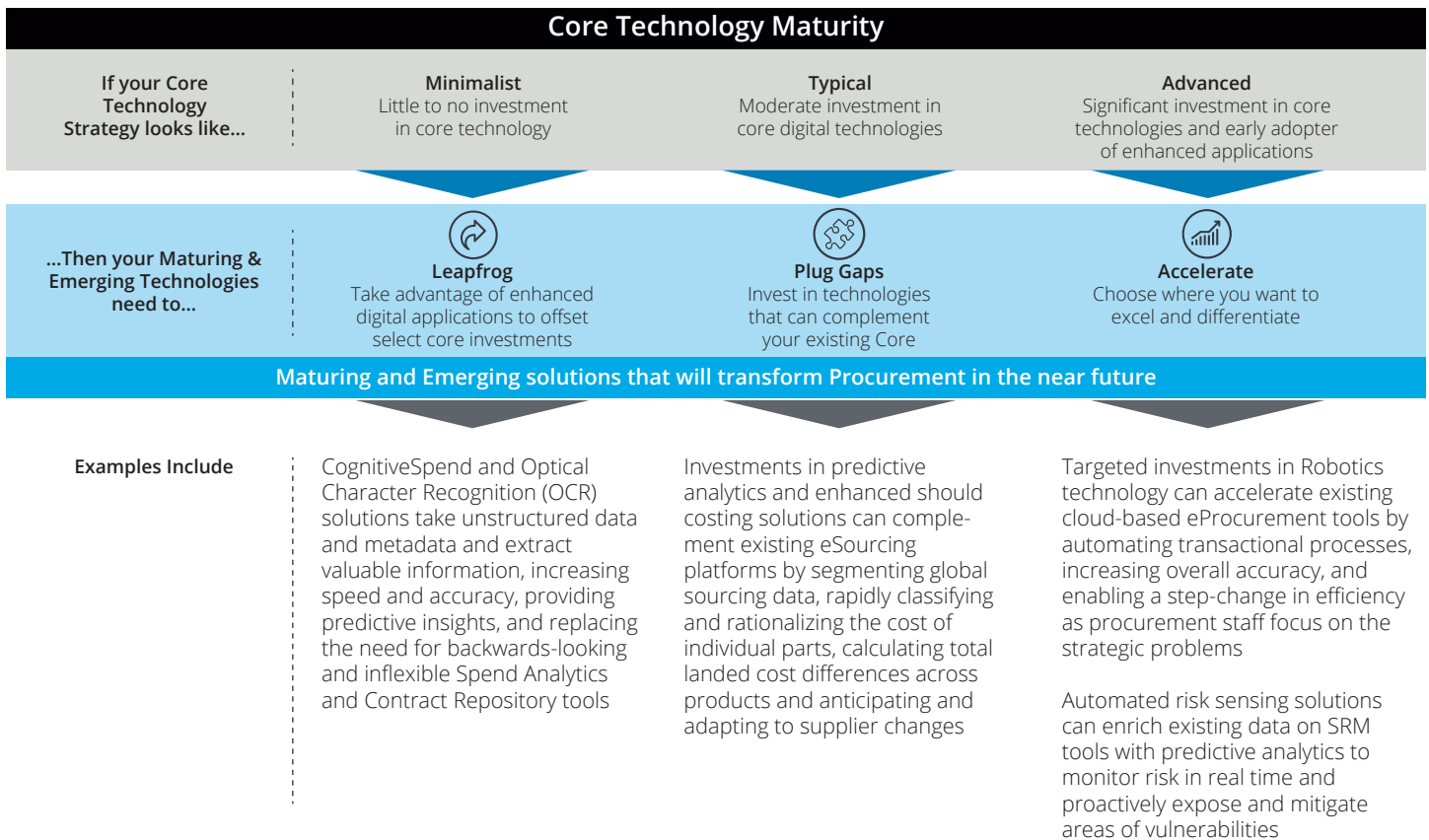
terms of data and existing systems. A digital procurement strategy should take into account the current level of core technology maturity (figure 4).

- Companies with minimalist investments in core technologies can find value in maturing solutions that eliminate the need to make certain core technology investments – the leapfrog approach.
- Organizations that have a moderate level of existing investments often can use

targeted investments to plug gaps and drive even more value from these legacy investments by augmenting the existing technology.

- Organizations that have made substantial investments in core technologies can utilize emerging and maturing technologies to accelerate value capture and differentiate their teams.

Figure 4: Additional considerations and examples of each investment strategy



An Agile approach

It is worth remembering that many of these maturing and emerging technologies are not time- and resource-intensive capital investments, and payback is often measured in weeks, not months or years. In light of this, organizations should start small, act fast, and think big:

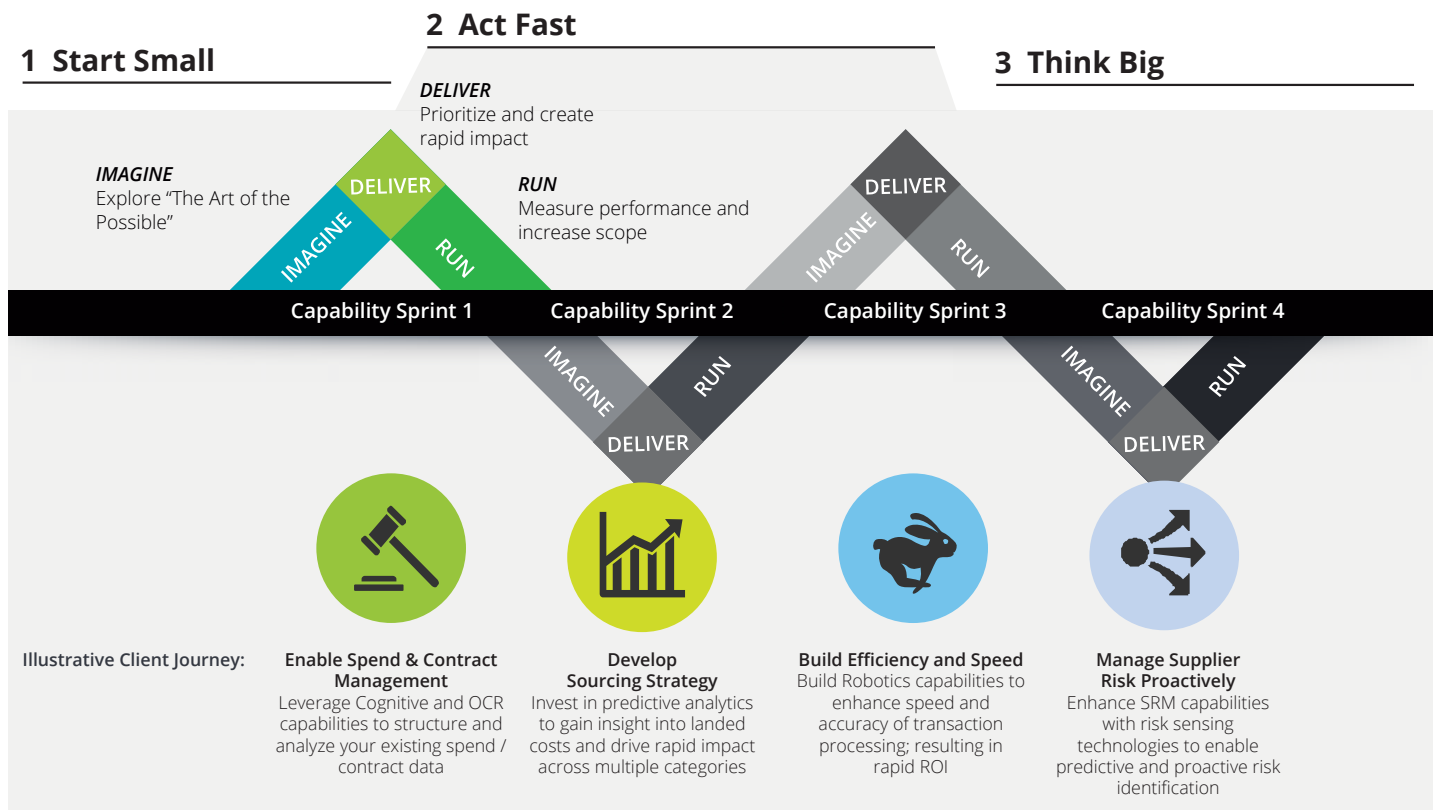
- Start small – pick one or two solutions to start the digital journey; prioritize projects based on impact, cost, and speed of implementation

- Act fast – rapidly validate the selection through a quick result and market the success to build momentum behind the journey; follow an iterative and “Agile” approach to develop solutions
- Think big – maintain a culture of innovation and continuous improvement; harvest the value of investments and leverage insights to develop further along the journey

An “Agile” approach—focused around short, iterative sprints—can be quite effective for delivering digital projects. “Imagine-deliver-

run” sprints serve those who are ready to act fast and start deploying capabilities and obtaining results. This method establishes the vision and priorities (imagine), rolls out a digital capability (deliver) and drives rapid adoption to generate value (run) (figure 5).

Figure 5: Additional detail on the “agile” approach, along with an example of the technology journey an organization might undertake



Clients interested in continuing to deliver cost leadership can start their digital procurement journey in the S2C space working with typical data available to them, like unstructured sources of supplier spend or hard-copies or PDFs of contracts, to uncover new areas of value. Other organizations, interested in operating with efficiency of resources, can start their journey automating one or two repetitive P2P processes and enable redeployment of resources to problem-solve other areas. There will also be organizations more concerned with managing supplier risks. These organizations can start their journey by automating risk sensing for a supply chain component in order to get early warnings on issues related to suppliers, foreign countries, or their ecosystem (e.g., food safety concerns, disruptions of supply, etc.).

The talent impact

The imperative for procurement professionals to be well-versed in digital solutions is three-fold:

First, as buyers of these solutions, procurement professionals need to be educated on the solutions and recommend a suite and sequencing of technologies that drive the most substantial impact.

Second, as implementers of digital solutions, procurement teams need to be prepared for a different working relationship with IT. Since many of the technologies involve minimal integration, they may be primarily owned by the procurement team,

rather than IT. This is different relative to larger legacy system rollouts.

Third, as consumers and users, procurement professionals must be able to extract value from digital solutions. Digital procurement may be the quickest path for a procurement function to drive substantial, measurable, and differentiated impact for its organization. Currently, the associated early-mover benefits are significant, and leading procurement organizations are establishing expectations that team members are continuously educating themselves and the rest of the organization on digital procurement innovations.

The lab

Some of our clients are not ready to start defining strategy or start sprints. They prefer to kickstart their journey with an immersive experience and learn more about digital procurement and digital supply network capabilities.

We welcome these clients to any of our Deloitte Greenhouses around the world to experience digital capabilities through demos and meet us to discuss the applicability of digital capabilities to their specific situations. Typical objectives of our digital procurement Greenhouse labs are to help our clients deepen their understanding of innovative technologies and their application; explore the art of the possible for their procurement organizations; and chart a customized digital procurement journey.

Conclusion

There is no end in sight to the growing pace of technological innovation fueling an expanding pipeline of digital procurement solutions. Procurement leaders should expect a rapid pace of change and continued evolution of the procurement function. Leaders that are able to adopt these solutions have the opportunity to execute on their main missions with radically greater insight and efficiency. They can also expect to further advance the strategic agendas of their organizations, positioning procurement to better enable new product design, M&A synergy capture, environmental sustainability, and new market entry, among others.

Taking the first steps on the digital journey has never been easier. The new breed of solutions is characterized by low investment costs and minimal integration requirements, and even a reduced dependency on IT to support rollout and maintenance.

Organizations with less legacy technology solutions can leapfrog some larger systems investments, while those with a more robust portfolio can use digital procurement solutions to get more from these tools. An “Agile” approach to adoption can yield quick value, fueling both savings for the organization and the next round of digital procurement investment.

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