The Journey to Your Autonomous Procurement Starts Now!

Introduction

The decades-old promises of the original procurement software vendors are finally starting to be realized in modern source-to-pay (S2P) platforms — but only in the hands of senior buyers who understand how to drive the technology.

For years vendors have been promising process automation, simplification, and value generation — the tenets of digital procurement. Yet most have done little to bring their technology to such a level. True automation is a rare find, as are predictive, self-learning systems that don't require a power user to handle exceptions. And only a handful of vendors are even looking beyond this toward fourth-generation, network-enabled procurement platforms — a journey that starts with technology that assists buyers in completing tasks and ends with a platform that applies knowledge collected from buyers to do the tedious parts of their jobs for them.

The implementation of such a vision is not yet available from procurement vendors and it will likely be 2025 before early network-enabled, autonomously intelligent procurement platforms become a reality. But that doesn't mean businesses must wait until 2025 to begin their journey to full

digitalization with autonomous procurement. Rather, it means that they need to select a vendor with the vision to get there and start today, because it is a journey.

Why do you have to start now if you want to be truly digital? Why can't you wait a second longer? That's one of the questions we will answer in this paper, along with what autonomous procurement actually is and why it will transform your procurement organization. And to help in that effort, we also clarify the four levels of digital procurement organizations must progress through to get there. (It's not as easy as the mis-information marketers will lead you to believe.)

But if there's one takeaway you need to know, it's this: Only organizations that start today can even hope to reach autonomous procurement within five years. Because if you delay, you'll need to progress through each level of digital procurement to get there — which puts you a decade (or more) away.

The Levels of Digital Procurement

With respect to procurement platforms, there are four levels of digitalization, each of which also maps to the levels of artificial intelligence. The progression begins with, in reality, non-digital solutions that merely digitize manual processes and ends with not yet realized solutions that act autonomously on behalf of users and teach themselves to improve over time.

Level 0: "'Digitized' Procurement" - Where Most Software Providers Are

Today, many vendors are offering capabilities that mimic artificial intelligence using classical statistical approaches — this is the defacto level of "AI" on the market today. The reality is that many solutions on the market today that claim to have AI don't have any AI at all. A recent study from venture capital firm MCC found that 40% of European startups that are classified as AI companies don't actually use artificial intelligence in a way that is "material" to their businesses. And even that definition was arguably weak, given that firms with only rule-driven robotic process automation that couldn't learn or evolve over time made the cut.

Similarly, there are a lot of products in the procurement market that are claimed to be modern solutions when all they do is digitize manual processes. These solutions allow organizations to collect data and conduct events faster than ever before, but they don't reduce the manpower required. In fact, they generally increase required manpower to process all of the data generated, as every piece of information still has to be manually reviewed, manual requests for corrections need to be made to supplier representatives, and so on. These solutions digitize speed communication time, but they don't really deliver any other benefits.

Level 1: Automation Built on Assistive Intelligence

The first level of digital procurement is automation, which is built on assistive intelligence — **a type of system that can automate repetitive and standardized tasks performed by humans.** This first level of digital procurement is capable of automating simple tasks using RPA (robotic process automation) that can be customized to the organizational process and reconfigured over time as processes, or data streams, evolve. At this level, the intelligence is minimal as the system runs on human-defined rules that can be changed over time. In addition, such systems will also include analytics and insights to suggest when a rule should be modified or flex definitions to allow the system to make close calls.

For example, the ability to automatically approve an invoice under $5,000 when there is a PO match and the amounts match within 1% tolerance is rule-driven RPA, but the ability to identify that the last three invoices within 5% tolerance were approved and suggest that the tolerance be increased is assisted intelligence and true automation -- the system helps you automate processes versus just digitizing them.

Automation should permeate the platform from the time a buyer logs in until the time a buyer logs out. A platform with automation can automatically run opportunity assessments, automatically retrieve current and past suppliers associated with a category, and automate the majority of the supplier on-boarding process. An advanced platform might also suggest an award based on demands and constraints, recommend a contract template and pre-populate it with award data, and automate the negotiation process and document exchange.

Key characteristics of a platform based on Automation:

- All aspects of procurement are digitized - nothing is done on paper outside the system
- Rules-based or configuration-based workflow and RPA is used to automate simple tactical processes
- Embedded analytics with roll-your-own metrics, KPIs, and reporting

Level 2: Augmented Procurement Built on Augmented Intelligence

The second level of digital procurement is augmented intelligence — **defined as a system that can learn from human feedback and provide better insights and recommendations over time on one or more specific tasks.** The tasks are typically specific and the capability limited, but if the task is one that humans have difficulty with, it's still immensely valuable. **Whereas an automation solution will guide a user through a process, an augmented solution will guide a user to a decision.** This guidance will be based upon encoded historical knowledge and best practices.

Take on-time delivery prediction, for example. Many humans have no idea how to objectively define and compute this metric, and the few humans that do need a lot of data, time, market insight, and experience to arrive at a reasonable prediction. But a machine, with enough data, training, and computational power can often get to 95% accuracy, or better, in seconds when a human might never achieve that level of accuracy.

It may also guide the user to the best overall catalog item when there are multiple on-contract or preferred options using price, delivery time and thresholds needed for contract satisfaction and discounts. It may suggest which suppliers or products may need to be put on contract or given a preferred status. It may provide risk assessments when a purchase order comes in and/or identify low-risk finance options. Simply put, the platform helps the buyer make good decisions.

Key characteristics of an Augmented Procurement Platform:

- Best practice suggestions driven by configurable rules, analytics and machine learning
- Smart assistant that learns typical user workflows and presents the most likely options in response to a query, (award) recommendation, or natural-language question
- Automated data cleansing and enrichment

Level 3: Intelligent Procurement Built on Cognitive Intelligence

The third level of digital procurement uses cognitive intelligence — **defined as a system that can learn from humans and then adapt its behavior and recommendations across real-world situations to mimic the performance of the best human experts over time.** For some technology providers, this is the Holy Grail, as it's as close as we can currently expect to get to true artificial intelligence-powered digital procurement in the near term. **Whereas an augmented procurement system will guide a user to the most appropriate best practice, an intelligent procurement system will determine when the encoded best practices are inappropriate or need to change and alert the administrators.**

Tomorrow's intelligent procurement platforms will lay the foundations we need to power truly autonomous procurement in the future. While there are vendors out there today marketing cognitive solutions, we will warn you that while many of these vendors are on the cognitive path, most have augmented intelligence built on top of a strong RPA platform that allows certain tasks to be "automated" but only when thresholds are met. A human still has to make the decision to go from human-decision to machine-decision, so it's not truly cognitive (but that doesn't mean it's not good enough to meet an organization's needs).

To put the levels into perspective, an automated solution allows an invoice, under certain exceptions, to be automatically processed and approved for payment by the machine without human intervention (as all of the data requirements are there, and it just takes a smarter system to put them together). By contrast, an intelligent solution allows the system to identify when an exceptional situation that would normally be routed to a human should be processed automatically as the system is able to predict with confidence what decision the human would take based upon previous responses to similar exceptions. For example, if the system detects that when an invoice is less than 20% above the cut-off threshold from a specific supplier for a given category, it has been approved 100% of the time, the system will learn a new rule and automatically process those exceptions going forward.

An intelligent procurement solution will not only provide the buyer with deep insights at just about every step of the process but will also allow the buyer to automate as many of those steps as possible based on adaptive algorithms using decisions that the organization has made over time. For example, if a behavioral analysis algorithm detects that organizational buyers always select the top 5 supplier suggestions when the confidence rating is above 80%, it will recommend adopting a rule to automate the supplier selection, invitations, and on-boarding for all sourcing events where confidence is high enough. If it learns that the buyer selects the automatically recommended award 98% of the time, or more, when the spend is under $100,000, automatically allocates the award, and creates the draft contract, from template, it will recommend defining an automatic workflow to do all this once the event deadline is reached.

Key characteristics of a Cognitive Procurement Platform:

- 98.5% or better true invoice automation; only truly exceptional situations that cannot be automatically corrected are brought to the attention of a buyer
- Automated sourcing for well-defined common non-strategic / low-value categories
- Automatic inventory replenishment based upon inventory levels, contracted, and real-time delivery predictions
- Guided-buying and automatic fulfillment for everyday requisitions

Level 4: Autonomous Procurement built on Autonomous Intelligence

The fourth level of digital procurement uses autonomous intelligence. **An autonomous intelligence system can not only learn from humans and adapt its behavior using cognitive abilities but also learn and adapt to new tasks and situations like an expert would without having to kick up an exception for human review.**

For example, if the OTD prediction of the system overall gets to 95% but the OTD prediction for a specific supplier levels out at 70%, the system will not only identify that the supplier is a special case and needs to be handled differently, but will run different models against the supplier to determine not only which models are best, but which models to use in specific situations. For example, it may be that performance varies by geography, category, or just exception by geography by category. In this case, the system will automatically determine which model to use in a given situation.

A truly autonomous procurement solution will not only have cognitive capabilities embedded throughout the platform, but will build on those capabilities to automate entire sourcing and procurement processes without any buyer interference whatsoever when the opportunity arises.

Building on our cognitive example, when the user selects a set of products and/or services for sourcing, if the platform can predict with high confidence the suppliers that will be invited, the event format that will be selected, the criteria that will be most heavily weighted for evaluation, and the contract template that will be ultimately selected, then it will recommend to the user that the user select “autonomous sourcing” and will handle the entire sourcing event automatically. The system will even adjust algorithms, weightings, constraints, and negotiation criteria automatically if bids

exceed expectations or market conditions change. The user will say source, and a few weeks later, will be notified that a contract is ready for review and signature.

Similarly, when a requisition comes in for a known product or service, the system will automate the selection of a supplier, and if the supplier is already on contract or has a preferred status, the entire process from PO through autonomous payment approval will be automated as well. If the supplier is not on contract or the purchase requires a contract, it will automate the entire process up to final contract review and signature.

Buyers will finally be free to do strategic analysis to identify new opportunities through category rationalization, supply chain redesign, product redesign, and market analysis. As a result, key functionalities we expect to see will provide real value will include:

- Automatic identification of categories, events, and requisitions for autonomous sourcing
- Intelligent assistants that can execute a sourcing or procurement task on a user directive
- Negotiation chatbots to allow the system to undertake real-time negotiations with potential award recipients

The Journey is Long ...

The journey to autonomous procurement is long and intensive, and it's not one you can wait to start. As mentioned in the introduction, you can't wait for a truly autonomous procurement system to hit the market to begin your journey, as you won't be ready to adopt it. It's more than a system, it's a state of mind ... and one that will take the organization years to achieve. Why?

1) It's a learning curve.

In fact, it's a parallel learning curve. First, buyers have to learn how to use the new technology effectively. Otherwise, they will spend even more man hours checking the system calculations and double-verifying the system recommendations offline when a good system will give them all the calculations and verifications they need with a few key presses if they know the right key presses to make (and how to interpret the facts presented to them). As part of this process, they will have to increase their analytical skills and their focus on strategic decisions versus tactical e-paper processing, which is what the average buyer spends most of their day on.

Secondly, the buyers will have to learn to trust the new technology. If you try to jump a rung on the autonomous procurement journey and take the user from a 20-step process to a two-step process, the chances of the average buyer accepting the new system are infinitesimal. AI is the new magic, and just like a village commoner used to fear the evil alchemist, the average person will fear the machine that can, apparently, eliminate the need for them. Every step you eliminate exponentially reduces your chances of the new software being accepted.

2) Systems need good data and a history of good decisions to learn from.

The reality is that no matter how smart we are told the system is, a modern computer program is still nothing more than a super-powered calculator that processes strings of 0s and 1s at a rate that is now about one trillion times faster than a human can. This means that they are still no smarter than a calculator and only make better decisions than us the majority of the time in certain situations because they can

a) execute more complex algorithms across
b) more data elements than we can.

This means that if they don't have enough data, they don't work. So you need lots of data. But it can't be any data, it has to be relevant, clean data. For example, even a few bad pieces of data can totally invalidate the predictive capability and accuracy of the system if the data is bad enough. If you don't put a system in place that is designed from the ground up to support cognitive

procurement, with the intention of getting to autonomous procurement, the data the system needs won't be there when these systems finally materialize. Generally speaking, the system will need at least three years of relevant clean data, and for complex or rarely sourced categories, five years.

3) The systems need to model your organizational processes and beliefs.

In order for a system to take over sourcing and procurement of non-strategic and low-value spend, which costs more in a senior buyer's time than the savings she is able to realize from conducting the event, the system has to learn to mimic the decision process of a buyer. This means that it not only has to collect years of data, but it needs to collect years of decisions and, also, years of feedback on system-generated recommendations that indicate the foundations for those decisions.

It's critical to remember that even the most advanced system is just a super calculator, and will need years of data, metadata, and behavioral data to learn to model the performance of an expert buyer. A system that cannot model an expert buyer for your organization cannot become autonomous. And then it will need to be able to learn and adapt to unexpected situations like an expert would so it can take over the non-value add sourcing and procurement activities of your procurement organization -- and finally free buyers up to be strategic.

… But Each Step of the Way is Rewarding!

When you start with a system that has solid automation capabilities, you can automate a lot of mundane tasks like invoice processing, budget checking, supplier verification, and so on and often reduce the manual processing by 90%. This allows the organization to tackle more strategic projects and start realizing savings immediately that come not only from tactical man hour reductions (as 2 people in the outsourced AP department can now do the work of 10), but additional identified savings from easy, quick-hit mid-value projects that the organization never had time for before.

The value increases when this system has augmented procurement capabilities that give you relevant information on a supplier when you need it, modified delivery predictions in real-time before a critical shipment is late and there isn't time to find an alternate source, and real-time insight into options that will fulfill contract obligations during the requisition phase. Contracting with a supplier that is facing bankruptcy, running out of parts and materials necessary to keep a production line running, and failure to meet contractual obligations all put the organization in serious financial risk -- and preventing the associated costs saves the organization a lot of money in (legal) manpower and damages.

Furthermore, if this system has a few capabilities that border on true intelligence, the benefits become almost immeasurable as any system that can help a buyer truly make an even better decision adds value each and every time it is used. In other words, such systems not only start delivering value on day one, but continue delivering value each step of the way. Considering that you can't jump from basic digitalization to intelligent procurement, why not start saving today and get an edge on your peers who will just fall further beind?

Why JAGGAER: The Spend Matters Perspective

JAGGAER understands that Autonomous Procurement won't happen overnight. It will take hundreds of man years of development and many years of real time to get there. Thus, if a vendor wants to get close to Autonomous Procurement by the end of the decade, they need to start now -- and JAGGAER realizes this and is actively working on next generation procurement.

Like a few of their peers, they now have a Smart Assistant that can not only act as an interactive help system but also guide a user to what they need to do and even initiate the action on behalf of the user. Moreover, by using natural language processing (NLP) and machine learning (ML), the smart assistant can adapt to the user's grammar and, over time, immediately give them the information they need without having to ask questions or present options for selection. This will make natural language interaction faster than point, click, and drill--drill-drill-down, which is the typical method of interaction with most platforms today.

They are pushing beyond the first level of Digital Procurement and into the next level of Augmented Procurement with forays into predictive analytics that go beyond simple trend prediction and into adaptive algorithms that learn from situations and feedback to give predictions on par with the best experts. For example, JAGGAER's recently released On-Time Delivery Prediction (OTD) capability can adapt to vendors, locations, and/or carriers and give predictions that are not only on par with experts but improve over time.

Moreover, they are also working on developing truly intelligent contract analytics that will not only parse contracts like best-of-breed competitors to extract clauses, terms, pricings, and obligations, but also monitor compliance against those obligations. Is the vendor invoicing at agreed upon rates? Are goods and/or services being delivered on time? Are the buyers ordering from the contracted vendor? Given that contract compliance and risk analysis will continue to be more important in the years to come, this is a very timely development.

Summary

In the age of basic digitalization almost every vendor claims to have artificial intelligence they don't have. Autonomous Procurement will be recognized only when we incorporate true machine intelligence—where the machine learns from you and eventually makes standard buys on behalf of you. But, as we made clear, you have to start now because:

1. It's a learning curve and you can't just implement a system and press the "easy" button.
2. Autonomous systems will require cognitive capabilities that require years of categorized and verified data to learn from as well as years of decisions based on that data to learn from.
3. Autonomous systems will require real-time guidance and correction from you to tailor their decisions to you, not just years of historical data and implied decisions.

And you need to pick a platform that is on the right track from a vendor that is

1. Working with clients to learn what achievable functionality is most valuable.
2. Implementing machine learning for well-defined use-cases today.
3. Building meta-learning solutions that can take feedback and decision adjustments and learn how to adapt to specific organizational needs and buyer personas.

Don't wait! If you don't have a platform that is building the necessary foundations for the Autonomous Procurement journey, you need to identify a new platform and switch over as soon as it's feasible to do so. And if you don't know where to look, you can start by looking at JAGGAER as they already have some augmented intelligence capability and are further down the path than many of their peers.