

How Predictive Procurement Orchestration is Revolutionizing Sourcing for Manufacturers as the Foundation for AI Transformation

By Bertrand Maltaverne



“The usual methods for boosting performance—process rationalization and automation—haven’t yielded the dramatic improvements companies need. In particular, heavy investments in information technology have delivered disappointing results—largely because companies tend to use technology to mechanize old ways of doing business. They leave the existing processes intact and use computers simply to speed them up.”

*‘Reengineering Work: Don’t Automate, Obliterate’
by Michael Hammer, Harvard Business Review (July–August 1990)*

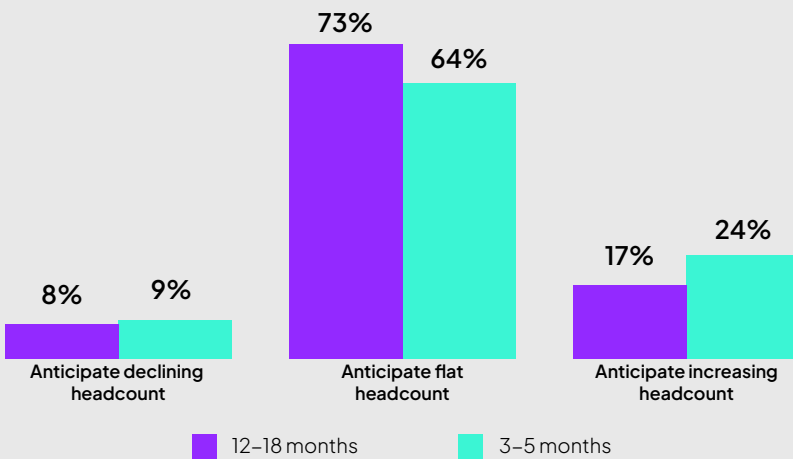
In 1990, HBR published “[Reengineering Work: Don’t Automate, Obliterate](#).” The article captures how organizations miss the potential of digital technologies. 34 years later, its observations are still valid for procurement technology.

In 34 years, digital technology has penetrated procurement, and it is now ubiquitous. While this transformation has brought some benefits, it has not solved the age-old procurement challenge to do more and better with less. This problem is more acute than ever because the total workload for most procurement professionals has grown, not shrunk, meaning that, for many companies, the workload has become a costly problem that is rapidly getting worse as today’s world is increasingly characterized by VUCA (volatility, uncertainty, complexity, and ambiguity). Old “tricks” won’t cut it.

The recurring challenge that most haven’t yet solved

As we mentioned, the perpetual struggle to achieve optimal efficiency and effectiveness has long been a central concern for procurement organizations across industries. This age-old challenge revolves around maximizing resource utilization while delivering value and streamlining processes without compromising quality. While this issue is not new, its significance has only intensified in today’s rapidly evolving business landscape, as the last few years have shown through several dramatic events that have impacted all companies directly or indirectly through their supply chain.

Anticipated procurement headcount changes



Source: KPMG, 2023 Global Procurement Survey

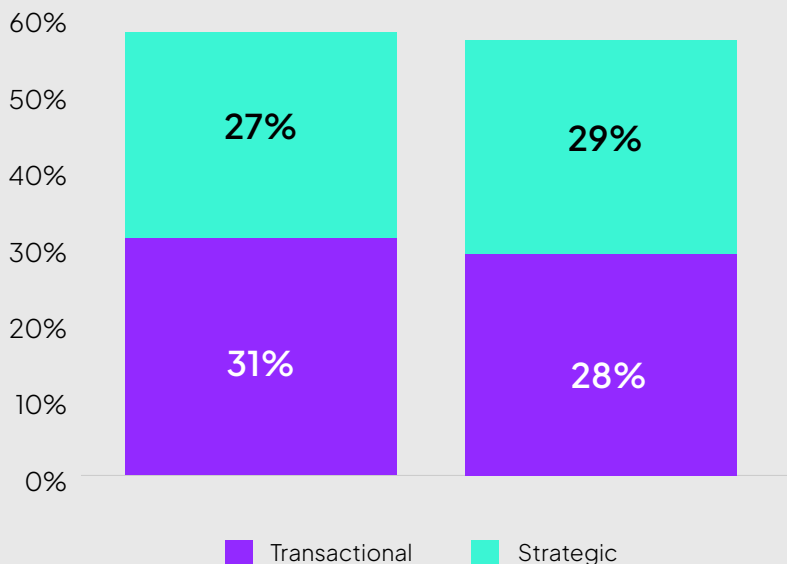
Procurement doesn't have endless resources, and it never did. Moreover, despite a growing volume of activities to perform, headcount is, for the most part, stagnating, as illustrated by KPMG in its "2023 Global Procurement Survey" (based on inputs from 400 C-suite and SVP/NP executives). Most organizations have not seen their staffing grow despite having to manage several major unforeseen events in the past years that impacted business continuity and profitability. The wake-up call that many companies got made them realize how

critical procurement and supply chain is, but it did not translate into getting more people. This will not change in the next few years.

This lack of adaptation in resource levels explains, in part, the fact that procurement has not gotten out of transactional or operational tasks at the speed it thought would and would like to. "More time for strategic tasks by eliminating the mundane" has

been a recurrent item on CPO's agenda for years. However, Deloitte's "2023 CPO Survey" (based on answers from 350 senior procurement leaders from more than 40 countries) shows that the time that procurement professionals spend on high-value (strategic) tasks has remained approximately the same (almost 30%) between 2021 and 2023. This is a useful framework for understanding digital transformation and the excitement around AI: it is the key lever for increasing procurement cycle per headcount.

Allocation of time: Strategic vs. transactional ('operational' not shown)



Source: Deloitte, 2023 CPO Survey

How Predictive Procurement Orchestration is Revolutionizing Sourcing for Manufacturers as the Foundation for AI Transformation

The traditional approaches, and their limits

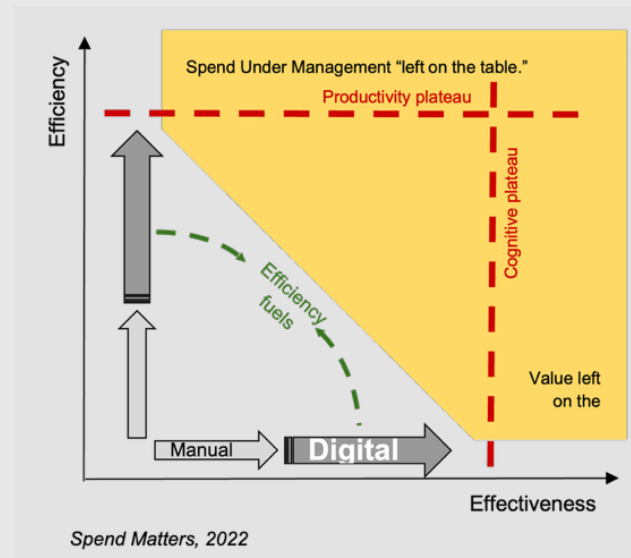
Multiple reasons explain why procurement organizations have struggled in their quest to do more and better with less.

Let's look at talent or, more precisely, **individual talent**. Even if talent correlates with better outcomes, solely relying on individual talent does not necessarily address the "scale" of the issue as it may create pockets of excellence but not a systemic (organization-wide and repeatable) increase in effectiveness. Also, and more importantly, more than 70% of CPOs surveyed by Deloitte for its "2023 CPO Survey" acknowledged that they had difficulty attracting talent over the past 12 months, with only 4% of firms saying that it is less difficult to find that talent. So, it is no surprise that "addressing the scarcity of talent supply through traditional talent acquisition channels (e.g., hiring full-time staff) is a top strategy for nearly all firms." Therefore, even if individual talent is critical, it doesn't represent a sustainable and immediate solution.

SELF-SERVICE

Another approach to increase productivity and liberate teams from low-value tasks to have them work on more strategic ones and break the "productivity" plateau is to transfer parts of their workload to other people.

Many procurement organizations introduced "self-service" tools, also called portals, to "enable" stakeholders (sourcing requests, intake, etc.) and suppliers (profiles, RFx bidding, etc.). But, more than "enablement," they were looking for ways to have others perform their low-value tasks.



Even if "self-service procurement" succeeded in its goal of transferring tasks, it caused collateral damage, because it dramatically increases the number of people in an organization who touch (or are involved in) a procurement process. This dynamic increases the likelihood that a process with so many links in the chain gets stuck. And these chains are only as strong (or fast) as their weakest link. While "self-service procurement" was hailed as

How Predictive Procurement Orchestration is Revolutionizing Sourcing for Manufacturers as the Foundation for AI Transformation

Kurtosis:

In probability theory and statistics, kurtosis is a measure of the “tailedness” of the probability distribution of a variable. It tells whether data looks flatter (or less flat) compared to the normal distribution:

- A high value tells that you have fat-tails (a lot of data in your tails).
- A low value means that you have light-tails (little data in your tails).
- Normal distribution (bell-shaped curve a.k.a. Gauss curve) has a kurtosis of 3

democratizing access to a once-opaque centralized procurement function, it has also created new bottlenecks which are increasingly being solved with added headcount that provide operational procurement services within a given business function.

In companies with “self-service” Source-to-Pay procurement systems, most data is entered by people who do not work in procurement and lack the motivation necessary to achieve a high-intent supplier selection or negotiated price outcome. For the purpose of this paper, “high-intent supplier selection” is defined as a selection decision that results in a process where multiple competitive options are evaluated on all of the relevant dimensions of value. The decline in high-intent supplier selection resulting from the self-service procurement has led to a well-documented increase in so-called “long-tail” spend filled with one-off transactions, fragmented across an increasingly complex supplier base.

To quantify the business case, it may be helpful to introduce one technical concept from statistical analysis: kurtosis, or “tail-fatness”. Procurement teams dealing with low-intent purchasing behavior are seeing that their “long-tail” is becoming a “fat-tail” as the kurtosis of spend linked to non-catalog Purchase Requisitions increases over time. This “fat-tail” dynamic represents a massive business opportunity for any large enterprise with a procurement function. Critically, this spend is neither high volume nor low value, contradicting commonly held understandings of “tail spend.” Instead, this spend is meaty, extremely addressable and filled with potential cost reduction and value creation opportunities. However, there are simply too many transactions for procurement teams to act on them, and the transactions are often temporally clustered together (for example, at the end of a fiscal year) for procurement to effectively benchmark or systematically improve their win rate.

It also creates an operational challenge in using data from previous transactions to benchmark and improve that win-rate at scale.

That’s why procurement leaders implementing self-service solutions are now beginning to ask: Is there a better way to increase high-intent supplier selection without adding steps or cycle time to the user experience? Is there a faster and better way to address more spend?

How Predictive Procurement Orchestration is Revolutionizing Sourcing for Manufacturers as the Foundation for AI Transformation

TASK AUTOMATION

But before answering these questions, let's look at another lever that many organizations use (often combined with the self-service approach we mentioned) to tackle their productivity challenge: **task automation** (a.k.a. autonomous sourcing, process orchestration). Self-service is about transferring tasks to people outside the procurement organization; automation is about transferring them to "robots." Such task- and process-based automations have been widely used on factory floors, and they are now penetrating offices and procurement teams.

Therefore, it is no surprise to see task automation mentioned as a key means of increasing productivity. For example, The Hackett Group's "2024 procurement key issues" states that "margin improvement/protection tops the enterprise priority list for 2024. To address this, businesses will emphasize strategies around **process efficiency, process automation**, working capital optimization and consolidation to shared services." The same type of recommendation can also be found in Deloitte's "2023 CPO Survey" where standardization (of policies, processes, systems, and data) and more flexible automation tools are listed as the top two strategies to manage workload. Deloitte also mentions that organizations should "continue [their] ruthless automation [...] supporting an autonomous driverless organization" because "procurement simply can't scale and focus on strategic activities while mired in transactional processes." Deloitte also highlights that leading organizations "want to reduce the 24% allocation of their time spent on transactional tasks down to 11%. They will do this with intelligent process mining/design and adoption (fully deployed or scaling) of RPA technology (including API- based integration) at three times the rate of their peers."

RPA (Robotic Process Automation) is a technology frequently lauded for its ability to enhance efficiency. By emulating human actions to automate repetitive tasks on a computer, it can serve as the driving force behind an autonomous procurement or sourcing engine. The potential benefits are vast, but it is essential to be aware of the caveats and potential collateral damages, much like the self-service approach.

First, as hinted in Deloitte's "2023 CPO Survey," process/task automation works best on standardized and repetitive processes. Therefore, a successful RPA implementation often means a lengthy and costly reengineering process that serves the purpose of aligning processes to one core model. Most mature RPA

How Predictive Procurement Orchestration is Revolutionizing Sourcing for Manufacturers as the Foundation for AI Transformation

implementations may leverage “smart” rules (“if this then that”), but they are still relatively static because someone has to program or configure them. Often, one size does not fit all.

Second, such an approach to automation creates a perfect storm. Standardization and autonomous (“dumb”) execution foster the implementation of the same age-old and so-called best practices. It has the consequences of aligning practices across companies (the opposite of a competitive advantage) and can even create dangerous situations, such as an excessive supplier consolidation leading to dependencies on a small number of suppliers and to an increased number of fragilities (bottlenecks, capacity, etc.) in supply chains. For example, let’s imagine an AI agent always awarded the lowest cost supplier. For many stakeholders of procurement, that could create a true nightmare.

Third, the quest for automation may allow organizations to quantitatively increase their output but not yield actual performance (value) increases. For example, an autonomous sourcing solution may enable an organization to send more RFxs than before, but do all sourcing events get quotes? And, even if quotes are coming back from suppliers, are they the optimum ones? The dilemma “quantity vs. quality” holds true, and autonomous sourcing is often a synonym of “spray and pray” (send as many RFxs as possible and hope that something good will come out). The risk with automation is that supplier fatigue will set in, and suppliers — especially those that are not improving their own win-rates — may become even more resistant to digital transformation projects. That does not serve the overall transformation goals of either organization.

Last and more importantly, pre-configured (smart) rules that are at the core of the traditional approach to automation may be good at speeding up repetitive and standardized processes, but they are terrible at adapting to changing conditions, which has become the new normal over the last months and years. As the number of billion-dollar supply chain events continues to rise year over year, this will pose a challenge to addressing a significant quantity of complex spend with automation alone, even if it is powered by a sophisticated set of AI agents.

That is why procurement leaders implementing autonomous solutions are now beginning to ask: Is there a better way to increase both qualitative and quantitative performance of our sourcing process? Instead of automating tasks, wouldn’t it be better to automate outcomes?

How Predictive Procurement Orchestration is Revolutionizing Sourcing for Manufacturers as the Foundation for AI Transformation

These questions, together with the ones we mentioned about the self-service approach, are especially important for direct spend, because manufacturers in various industries (automotive, chemical, food & beverage, etc.) understand that their purchases are different from indirect spend in that, as Kraljic popularized, direct materials are often highly strategic (high supply risk and high profit impact). For them, autonomous can be risky.



Source: Peter Kraljic, HBR

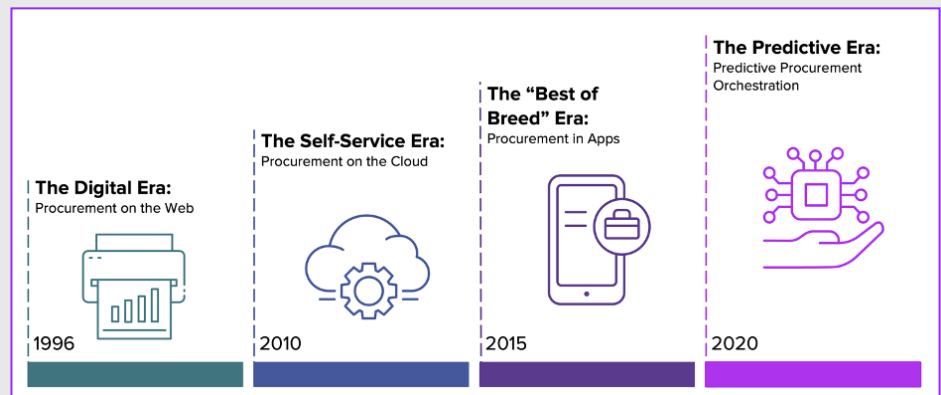
Therefore, the “do more and better” objective that many organizations pursue boils down to finding a technology that could constantly monitor procurement activities, identify and reinforce the value-creating supplier selection along with the best “best and final” quotes as benchmarks and make these optimal decisions the default across the enterprise, without users having to take any triggering action. Such a system would be able to orchestrate procurement events, cost improvements across every category of strategic spend, from indirect services to direct materials to logistics to CapEx, including where optimization rules need to be applied related to the number of awarded suppliers or filtering suppliers with certain attributes, such as geography. Such a system would require little to no training and could live in channels that suppliers are already using, such as email via DocuSign-like user experience that is so seamlessly integrated into existing systems and processes that most users never need to log in.

The answer is Predictive Procurement Orchestration (PPO).

How Predictive Procurement Orchestration is Revolutionizing Sourcing for Manufacturers as the Foundation for AI Transformation

Defining Predictive Procurement Orchestration

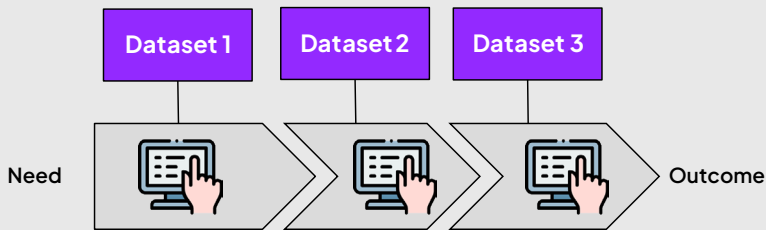
PPO is the latest evolution of digital procurement and represents the true digital transformation of procurement. It leverages technology to do things that were previously impossible.



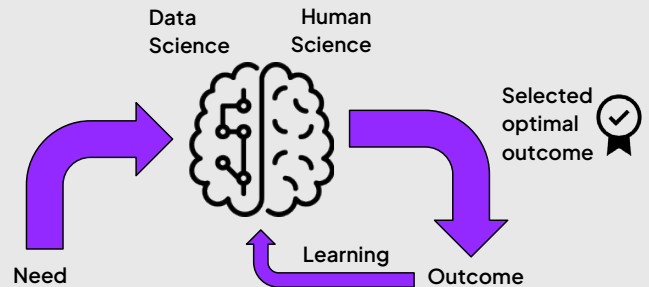
To qualify as PPO, a technology solution must meet the following three criteria:

- **Unique pricing theory approach** — By helping to put data in historical quotes to work across the enterprise, machine learning creates a baseline price at an item level and then calculates unique discounts to propose to individual suppliers based on supplier personas and past negotiation behavior. This is especially valuable for procurement teams with numerous line items, lanes or rows, such as MRO, logistics, packaging and bill-of-material-driven procurement. PPO creates a faster process by starting the negotiation closer to where you want it to end and eliminating the guessing game for suppliers by providing transparency into your thought process.
- **Leveraging behavioral science** — Telling suppliers how they are doing and suggesting what they should do next based on supplier characteristics personalizes the experience for suppliers. Dynamic feedback is unique to each supplier and lets them know not only how they are doing, but how they can improve, fostering stronger relationships to keep them motivated.
- **Foster supplier collaboration** — By simplifying the sourcing process for suppliers with an easy user interface, quotes over email and dynamic feedback during an event, suppliers are more engaged and encouraged to do more.

Traditional process-focused method: the process and supporting data steer towards an outcome. A user input/action is required at every step, multiple stakeholders are involved, often with low motivation/understanding of the bigger picture (from an outcome and data/insights perspective). Very limited learning.



PPO is "optimal by design": Data is the process, outcome defined based on all available data, all past interactions, and on behavioral considerations.



Predictive Procurement Orchestration applies several reasoning recommendations from previous events to help your team hone in all the way down to the line item level, shortening cycle times and allowing you to start events closer to where you want them to end.

Predictive Procurement Orchestration = (data science + human science) x predictive machine learning

Data science

PPO addresses data wherever it lives. It synchronizes across different systems to overcome silos, and it delivers the proper process to the right person in the desired medium through:

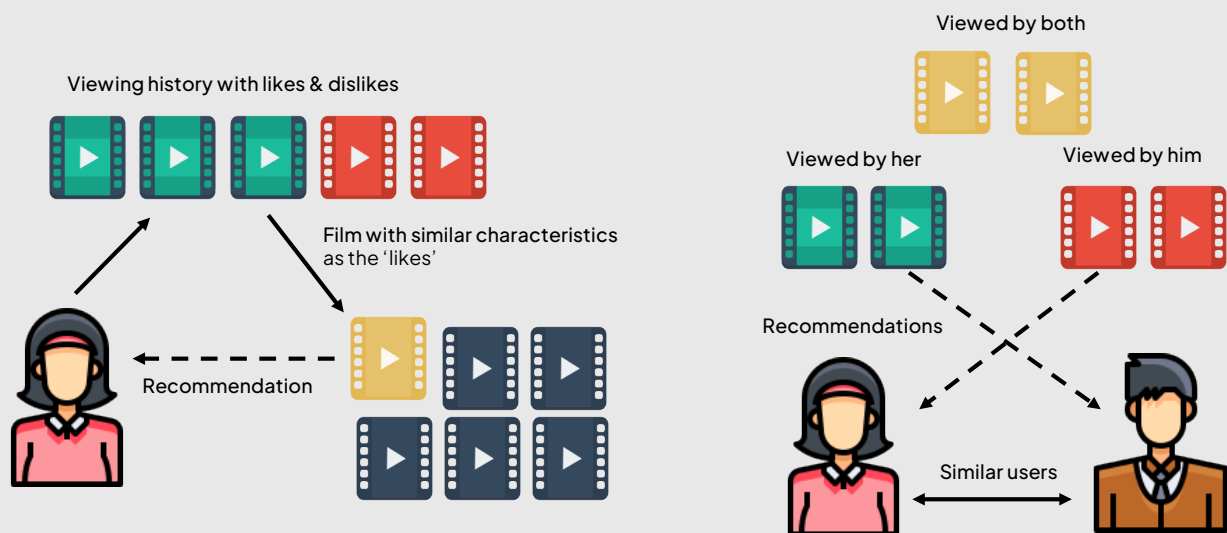
- Data clustering and iterative variance analysis (to understand context and similarities and to bucketize comparable transactions and synthesize predictions for future transactions)
 - Is it statistically normal or an outlier?
 - ◇ What is the best?
 - ◇ What is the worst?
 - ◇ What is the most frequent?
 - ◇ What are the parameters?
 - ◇ What outcome is the most likely?
 - ◇ What outcome maximizes value?
 - ◇ What is the confidence interval of the prediction?
 - Is there a cluster of transactions that says that this is normal?

How Predictive Procurement Orchestration is Revolutionizing Sourcing for Manufacturers as the Foundation for AI Transformation

- Recommendation system (to simulate and select the most favorable scenario)
 - Recommend best supplier per item: which supplier is most likely to provide the best price for that cluster of similar transactions?
 - Recommend price per item: What optimal savings-producing price is the supplier most likely to accept in exchange for greater predictability in sales cycle?

Recommendation systems or recommenders are powerful information filtering tools that can facilitate personalized content and/or services and provide tailored experience to individual users. Such systems play a central role in leveraging large amounts of data to make choices manageable. They make recommendations based on:

- A user's past activity (content-based filtering) and relationships between item characteristics: you watched movie A, the system recommends movie B because items A and B share similarities).
- Activity of similar users (collaborative filtering): person A has watched a specific movie, that movie is recommended to person B because persons A and B share similarities.



Also, recommenders learn from new data (loaded into the system or generated by each interaction with the system) and become more accurate. Amazon, Netflix and YouTube are examples of companies that have recommenders at the heart of their business models. PPO is the application of recommender systems driven by machine learning to procurement.

How Predictive Procurement Orchestration is Revolutionizing Sourcing for Manufacturers as the Foundation for AI Transformation

FOMO:

The term finds its origin in a research paper by Dr. Dan Herman, a marketing strategist, who coined the term “fear of missing out.”

It is often used in the context of social media, but it is applicable to more.

It is, in a nutshell, a fear of regret when someone might miss an opportunity.

Nash equilibrium:

In a strategic interaction, the outcome for each decision-maker depends on the decisions of the others as well as their own. One cannot predict the choices of multiple decision makers if one analyzes those decisions in isolation. Instead, one must ask what each player would do considering what she/he expects the others to do.

The prisoner’s dilemma:

It is an application of Nash equilibrium, and a type of non-zero-sum game in which two players can “cooperate” with or “defect” the other player. At the very heart of this game theory concept is self-interest which drives actions that appear rational to the individual in a specific situation at that time. However, should both parties put self-interest first then they will end up both being worse off. A key element is the fact that each participant does not know what the others will do although what they will do will impact each participant.

BEHAVIORAL SCIENCE

Business-to-business (B2B) and business-to-consumer (B2C) are, in fact, human-to-human (H2H). Humans are making decisions. Therefore, there is tremendous value in integrating human science, especially behavioral economics, into every procurement activity (other than face-to-face negotiations where it is more traditionally acknowledged and applied). It is why behavioral science and game theory are the other pillars of PPO, and these factors influence more than what we have covered above.

It is because confidence around the range of possible future prices enables precision transaction routing to a list of ranked suppliers, creating fear of missing out (FOMO).

Once the orchestrator has been able to propose an outcome (a supplier and a price for an item in a sourcing event) without requiring any manual intervention, it can move forward and send a proposal to suppliers. In addition, concepts like the Nash equilibrium and the prisoner’s dilemma are used to foster optimal pricing and post-award compliance.

The above is at the heart of the concept of “intelligent counter offer” that refers to the ability of Predictive Procurement Orchestration to generate immediate responses or alternative offers to suppliers in sourcing events to speed up the negotiation process and potentially secure more favorable terms.



“The final price of an item is often higher when the seller makes the first offer than when the buyer takes the lead... Buyers should always aim to put the first offer on the table, and therefore set the anchor for negotiations.”

Chartered Institute of Procurement and Supply

How Predictive Procurement Orchestration is Revolutionizing Sourcing for Manufacturers as the Foundation for AI Transformation

What Are The Use Cases And Success Stories?

As we just mentioned, with Predictive Procurement Orchestration, it is possible to trigger a quote request without a human being involved. Such a use case, which is possible under certain conditions, is one of the many applications of PPO.

| REACTIVE PROCUREMENT | PREDICTIVE PROCUREMENT |
|--|--|
| Measure outcome vs backwards -looking baseline | Measure outcome vs forward -looking target |
| Quote is manually created by supplier, analyzed and cleaned by procurement analyst | Quote is drafted and individually optimized by AI using a large and contextual dataset, an instant feedback is given by AI before procurement analyst reviews |
| Quotes from suppliers are compared apples-to-apples primarily based on lowest price | Quotes from suppliers are instantly ranked on many dimensions including MOQ, lead time, and geography |
| Quotes from sole source or single source suppliers are often approved by default due to lack of leverage and comparability | Quotes from sole source or single source suppliers are instantly compared versus the predicted outcome and are corrected to minimize money left on the table |
| Quoting can introduce errors in item IDs, descriptions, prices, etc. that complicate the creation of a solid "data foundation" | Quoting can validate data entries creating a dynamic item master that continuously improves the "data foundation" |

SLICING SPEND FOR AN INDUSTRIAL FOOD PROCESSING COMPANY

Provisur Technologies, a leader in industrial food processing equipment with over 50 years of experience and 350 global patents, partnered with Arkestro to streamline their procurement processes and achieve significant cost savings. With an annual spend of approximately \$200 million and a global procurement team, Provisur needed a solution to enhance efficiency and flexibility.

Despite initial resistance from the procurement team, the implementation of Arkestro quickly proved its worth. Provisur achieved \$350,000 in savings across four campaigns and processed \$2.6 million in spend through the platform, realizing an average savings of 20% per event.

Arkestro's hands-on support and intuitive platform won over the initially skeptical team who praised Arkestro's exceptional customer service, which became an integral part of Provisur's

How Predictive Procurement Orchestration is Revolutionizing Sourcing for Manufacturers as the Foundation for AI Transformation

operations. The platform not only formalized procurement processes but also drove internal competition and innovation among buyers.

In less than 60 days, Provisur saw campaign savings ranging from 11.0% to 37.6%, and the platform helped suppliers grow their businesses. Provisur's partnership with Arkestro continues to drive cost savings and efficiency, positioning them for future growth opportunities.

PREDICTIVE PRICING IN THE FOOD INDUSTRY TO IMPROVE SUPPLY CHAIN RESILIENCE

Materne North America, a member of the BEL Group, also known as GoGo SqueeZ, is the leader of "Applesauce in a Pouch." It has a significant carton spend of \$20 million yearly and buys many different carton sizes and types.

Materne faced a complex set of challenges. It needed to expand its supplier base to keep up with rapid growth (double digits every year) and simultaneously mitigate risks to their supply chain to ensure business continuity. This required a strategic and comprehensive approach.

Adding new suppliers, a crucial step in Materne's growth strategy, required a collaborative effort. It involved multiple teams beyond procurement, who had to balance their efforts with the company's innovation pipeline and existing workload issues.

Materne was able to exceed its objectives because, in addition to adding new suppliers in their panel to have more sourcing and purchasing options, it also achieved significant cost savings (\$1 million in a single event).

GOING BEYOND PREDICTIVE PRICING AT A CHEMICALS COMPANY

Dover Chemical Corporation, a provider of chemical specialty products, faced significant challenges due to the impact of COVID-19, including tight PPE supplies, pricing challenges and overall MRO parts scarcity.

Dover Chemical had accumulated 1–2 years' worth of data from a recent maintenance system implementation. However, it lacked the tools to extract meaningful insights from that data, hindering its ability to effectively identify cost-saving opportunities and optimize supplier relationships.

How Predictive Procurement Orchestration is Revolutionizing Sourcing for Manufacturers as the Foundation for AI Transformation

With the implementation of PPO software, Dover Chemical overcame its procurement challenges, leveraging predictive capabilities to negotiate with suppliers, secure supply and save money.

Dover Chemical experienced a significant boost in its procurement capabilities with the integration of PPO. This integration increased the amount of spend they could manage and drove better outcomes through predictive pricing. The company now uses PPO daily, empowered by its multiple predictive capabilities, to accelerate savings and further reduce cycle time.

Conclusion

We already pointed out that the “old way” of doing procurement had not solved the problems it was supposed to fix and created unintended consequences, including poor data quality, ballooning “tail suppliers” and increasingly complex approval flows that add labor and time without adding value.

Predictive Procurement Orchestration, however, creates a virtuous cycle of high-intent procurement activities, including supplier selection, quote analysis and award allocation across the supply base. Companies capture new incremental savings and see results in less than 30 days.

In addition, PPO unlocks benefits in terms of speed and agility. Organizations applying PPO can procure and react faster to events in the market, which is an essential competitive advantage in terms of:

- meeting evolving customer needs and demands in a timely manner (NPI/NPD and time-to-market).
- managing volatility and inflation.
- ensuring business continuity and supply insurance (resilience and antifragility).

Procurement excellence is already here — it’s just really expensive to scale without the right platform in place.

However, the combination of the evolutions in predictive models, behavioral science and game theory can change that. There is a massive opportunity to obliterate and not just simply automate how things are done.

How Predictive Procurement Orchestration is Revolutionizing Sourcing for Manufacturers as the Foundation for AI Transformation

The application of behavioral science and predictive models lays the foundation for applying autonomous sourcing and procurement automation to the supplier and spend categories where it is most relevant and impactful, and that is what we call Predictive Procurement Orchestration, the necessary precondition for procurement's AI transformation. PPO can synchronize data across different systems overcoming silos to identify the great things that teams are already doing and scale those insights to more spend faster than hiring and training added operational headcount.

PPO does so by simulating a procurement process before it begins, predicting a range of outcomes, ranking and filtering them to exclude anomalies and exceptions to ultimately execute the optimal actions. Then, it delivers the proper outcome to the right person in the desired channel.

The result is fewer steps, fewer decisions, less typing, a better user experience and all the business benefits of high-intent procurement that include price reductions, supplier performance and omnidimensional cost savings aligned with the broader value agenda of organizations.

Category-independent algorithms allow PPO to add value across all spend categories, including indirect, direct, MRO, logistics, services and more, from spot buys to strategic negotiations.

Procurement has long been criticized for being short-sighted in optimizing for short-term cost savings — because that is how many organizations measure procurement's success. By optimizing for high-intent and high-impact decision making, procurement teams can deliver best-in-class cost outcomes, delight both suppliers and business stakeholders and create a common understanding with suppliers regarding service level agreements and performance expectations. Yes, procurement can have it all. The key is using predictive models to determine the holistic best value outcome across an omnidimensional set of relevant parameters. And coincidentally, that's what AI is uniquely suited to deliver.

