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MyCarrier TMS is a Logistics' Managers dream come true!
Heather B, Supply Chain Account Specialist

Procurement: What's next?

I recently returned from three days in Atlanta at the Modex trade show. Although advertised as a supply chain event, it's really a materials handling automation show with a handful of logistics providers thrown in for good measure. Heading out the door to the airport, I had no idea what to expect. The two-year absence from the trade show and conference scene had me, and many of the individuals I spoke to before the show opened, wondering what's next—not just for the show but for operations in general.

If the turnout and the enthusiasm is any indication, I think supply chain is in pretty good shape these days, despite the disruptions we've all lived through. The show was packed, and attendees were on the hunt for solutions to optimize their manufacturing, order fulfillment and delivery operations. Ultimately, that energy is going to turn into POs, and those POs will be managed by procurement. It's going to be another busy year.

As in year's past, the May/June issue of *SCMR*, is focused on procurement. After all, while planning is the first step in the process, it's followed closely by procurement, which is responsible for validating and working with suppliers to make sure the supply chain show goes on.

This year's issue kicks off with an article from Stephanie P. Thomas, Monique L. Murfield and Jacqueline K. Eastman on how to keep negotiations on track when a supplier changes course in unexpected ways.

We follow with a look at how to get the most from competitive bidding from a team led by Kate Vitasek, best known for the Vested approach to procurement and a frequent contributor to *SCMR*.

Bob Trebilcock, Editorial Director
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To help win the war for talent, we've included a piece that looks at why the way most of us advertise for open positions in procurement is out of sync with what the profession says it needs to answer the "what's next" question.

And we round out the issue with an article from Mark Trowbridge looking at the ins and outs of *force majeure* contract language and another from Tan Miller on the impact of buy now/pay later marketing on supply chains. We trust they'll help your organization think about what's next for your procurement team.

One final note: This year's NextGen Supply Chain conference will be a live event again at the Chicago Athletic Association, October 17-19, 2022. As in previous years, we'll focus on digital transformation and the emerging technologies that are enabling that to happen—with an emphasis on the experiences of your colleagues. We hope to see you there. You can learn more about the conference at **nextgensupplychainconference.com.**

SUPPLYCHAIN MANAGEMENT REVIEW

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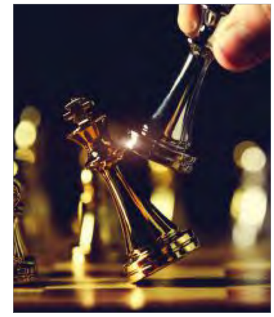

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Decision making under uncertainty: A primer

Dr. Lapide is a lecturer at the University of Massachusetts and an MIT Research Affiliate. He has extensive experience in industry, consulting, business research, and academia as well as a broad range of forecasting, planning, and supply chain experiences. He was an industry forecaster for many years, led supply chain consulting projects for clients across a variety of industries, and has researched supply chain and forecasting software as an analyst. He is the recipient of the inaugural Lifetime Achievement in Business Forecasting & Planning Award from the IBF. He welcomes comments on his columns at llapide@mit.edu.

In my last Insights column[1], I advised that when a portion of a supply chain becomes froth with uncertainties, it's best to sever that portion and let supply-demand operational planning for it be handled by an ad hoc quick response (QR) team, one that is adept at making decisions under uncertainty vis a vis under risk[2]. Why did I believe so? Basically, because the probabilities of uncertain futures are inestimable. Hence, one can't use traditional decision making (DM) under risk methods that are predicated upon assuming a stable probability distribution exists.

Instead, one has to apply the "muddling through" approach. That is, "managing to do something although you are not organized, and do not know how to do it." Intractable problems can only be solved by muddling through until sufficient data is gleaned to develop proven, data-based ways to improve the situation. Executives in uncertain environments must make fast high-risk decisions as they muddle through, while basing them on negligible information and simple, practical decision-supporting models.

Winning during the pandemic

As a retiree on the sidelines, I observe global supply chains from afar. Most of my recent columns have dealt with identifying what companies have been doing during the pandemic. I've focused on those companies that appear to be outpacing their competitors as well as those that are losing business because of it. I'm especially concerned that global supply chains are currently being blamed for hampering the growth of worldwide economies. Based on what I've observed along with my years of experience, I've been offering advice on how to forecast and plan under risk and uncertainty, especially uncertainty.

Early in the pandemic, the losers were those whose supply chains faltered because they had never been tested by a global crisis. For instance, the pandemic exposed serious shortcomings in two extremely important U.S. supply chains: food and personal protection equipment (PPE).[3]

There were also winners that stayed the course and beefed up their existing supply chains to succeed. In a previous column[4] I discussed COVID-19's profound impact on the overall retail market. Essentially, the strongest e-tailers got stronger on their prowess, and the weak got weaker.

Other winners used a variety of ways to succeed. Zoom, for instance, was able to rapidly capitalize on its existing video conference software that helped educators and employees to work from home during the lockdowns. As reported by the *Wall Street Journal*, Lego, the No.1 toy maker, was able to grow its market share by taking advantage of investments it had already made to its digital platform and new physical stores.

When I first heard the news about the shortage of semiconductor chips necessary to manufacture automobiles, I wondered: Whatever happened to "speculative buys" by purchasing managers? Were there none savvy enough to realize that a shortage of these oftentimes proprietary chips would shut down production? It turns out that Toyota made a decision early in the pandemic "to stockpile computer chips," according to the *WSJ*. The result is that Toyota is now the leading auto manufacturer in the United States after surpassing GM, which had been the No.1 auto seller in the United States since 1931.

But perhaps the biggest winners were in the health care industry, such as the pharmaceutical/biotech firms that quickly developed the COVID-19 vaccinations used worldwide. To some extent they had to take great risks, with support from government, to prove that they were up to the task of saving untold lives. 3M, the inventor of the industrial mask, was another winner because masks were needed by medical personnel, especially in ICUs. I am sure that other winners will emerge as time unfolds.

Start with a payoff matrix

Early in the pandemic I read a prescient *Wall Street Journal* article from 2019 titled "Hey CEOs, Have You Hugged the Uncertainty Monster Lately." The article argued that sometimes "one can make lemonade out of lemon events" by turning an adverse event into an upside opportunity, as was the case with Zoom, Toyota, Pfizer and Moderna. One executive was quoted as saying: "As the unknown becomes known, a choice is to expect it, welcome it, embrace it, and make choices that create a new competitive advantage."

They key is effective decision making (DM) during challenging times.

Decision making (DM) under both risk and uncertainty starts with developing a payoff matrix. It involves understanding the uncertainties and/or risks, their implications and finally, deciding what to do once these are fully understood and delineated. The rows in the payoff matrix illustrated in Figure 1 represent different alternative courses of action one might take, for example, the planning decisions made. The columns represent the random states of nature, outcomes or future scenarios that might occur. The entries in the matrix cells represent payoffs or benefits, such as

FIGURE 1

FUTURE 2025 SCENARIOS

2025 profitability ($M)	Pre-COVID normal	Moderately changed post-COVID normal	Significantly changed post-COVID normal	Minimum payoff	Maximum payoff
Business as usual practices	1,000	950	900	**900**	1,000
Slightly modified practices	875	1,000	975	875	1,000
Heavily modified practices	800	1,025	1,100	800	**1,100**
COLUMN BEST	**1,000**	**1,025**	**1,100**		

LOST OPPORTUNITY MATRIX

2025 regret ($M) (Column Best – Payoff)	Pre-COVID normal	Moderately changed post-COVID normal	Significantly changed post-COVID normal	Maximum regret
Business as usual practices	0	75	200	200
Slightly modified practices	125	25	125	**125**
Heavily modified practices	200	0	0	200

Source: Author

profits, cost savings and margins that would occur when a specific decision was made in conjunction with the future scenario that happened. I'll discuss this in more detail below.

Evidently industry has started to think about using scenarios of the future when faced with tackling the pandemic's uncertainties. A recent *Bloomberg Businessweek* article, "Leaders can prepare themselves better by considering multiple outcomes," notes that to "adjust to this turbulent environment, leaders are turning increasingly to a strategy that was previously reserved for unlikely or extreme events. Rather than follow a plan, they identify a handful of scenarios that might arise and the one or two responses each might require." This approach is in contrast to traditional DM under risk in which a demand-supply plan is largely developed by middle-managers and based on point demand forecasts. DM under uncertainty has little use for historical information as it is too risky an endeavor to be left to middle-managers.

A payoff matrix framework for uncertainties

The purpose of a payoff matrix is to fully identify the implications of what might happen should each of the possible courses of action be taken when each of the outcomes occur.

The "best" decision for a company under uncertainty depends upon its own, as well as its industry's, aversion to risk. For example, an optimistic risk-lover might gamble to try to get the highest payoff possible while a pessimistic risk-averter might gamble to get the best of the worse payoffs possible.

For example, pharmaceutical and entertainment companies are more optimistic when it comes to developing high-margin, risky blockbuster drugs and movies. Meanwhile, retailers and grocers might take a more pessimistic, risk-adverse approach because they mostly offer products with steady demand but low margins. Another more realistic best decision might be a balance between the optimistic and the pessimistic. I espouse the one that minimizes the maximum regret among the decisions.

Once a payoff matrix is developed, one of three textbook approaches[5] might be employed to support DM as follows.

1. Maximax. An approach that might be employed by an optimistic risk-loving executive in a risk-taking industry. That executive would favor the decision alternative that results in the highest possible payoff.

2. Maximin. An approach that might be employed by a pessimistic risk-adverse executive in a risk-avoiding industry. That executive would favor the decision alternative that results in the best of the worst payoffs.

3. Minimax regret. An approach that might be employed by a balanced (optimistic vis-a-vis pessimistic) executive in an industry that does take reasonable risk with an eye toward minimizing future regret. This approach considers the opportunity cost of not selecting the best decision, if an executive had known an outcome in advance.

A COVID-19 hypothetical

To demonstrate how this DM under uncertainty framework might work let's take a hypothetical company with $1 billion in profits before the pandemic. The company has established a payoff table and is looking at three types of strategies to deploy throughout the pandemic until 2025. Figure 1 represents the analysis done as the basis for DM, including three types of alternative strategies to deploy and three future 2025 scenarios that might occur. The three alternative strategies are as follows.

1. Business as usual practices. Under this strategy the company uses its sales and operations planning (S&OP) team to drive business planning under the premise that by 2025 things will get back to normal. Therefore, there won't need to be much realignment of the demand-supply chains to support the business, such as normal changes in the mix of products offered, as well as suppliers.

2. Slightly modified practices. Under this strategy the company creates an ad hoc quick response (QR) team to do short-term operations planning for the demand-supply chain under uncertainty. The charter of the QR team is to recapture lost demand-supply and revise products as necessary by 2025 in order to get back to semi-normal, pre-COVID times.

3. Heavily modified practices. Under this strategy the company creates an ad hoc quick response (QR) team to do short-term operational planning for the demand-supply chain under uncertainty. However, the charter of this QR team is to recapture lost demand-supply, as well as possibly drastically revise products and suppliers by 2025, with the aim of creating a new competitive advantage with enhanced profitability.

The three future 2025 scenarios are as follows.

1. Pre-COVID normal. Under this future scenario the company's business environment in 2025 gets back to normal, pre-COVID. Therefore, the demand-supply chains to support it involve typical changes to the mix of products offered as well as suppliers. Typical industries that might get closely back to normal include grocery and food services.

2. Moderately changed post-COVID normal. Under this future scenario the company's business environment in 2025 gets moderately changed vis a vis before COVID. I suspect most industries will likely experience this type of scenario in 2025, however, the degree of change will vary by companies within industries.

3. Significantly changed post-COVID normal. Under this future scenario the company's business environment in 2025 gets significantly changed when compared to pre-COVID. The demand-supply chains will significantly change with respect to the mix of products offered as well as suppliers. Industries that might face this type of 2025 scenario include airlines and hospitality. However, the degree of change will vary by company.

Based on the maximax calculations, the best approach to be employed by an optimistic risk-loving executive would be "heavily modified practices." It would provide a chance to attain a maximum profitability of $1100M (because 1,100 is the highest number in the maximum payoff column of the table). Based on the maximin calculations, the best approach to be employed by a pessimistic executive would involve "business as usual practices." It would provide a chance to achieve the highest worst-case profitability of $900M (because 900 is the highest number in the minimum payoff column of the table). Lastly, based on minimax regret calculations the best approach to be employed by a balanced executive would involve "slightly modified practices" because it offers a minimal regret of $125M (as the lowest number in the maximum regret column of the table).

What we learn from this example is that the best decision under uncertainty depends on the level of risk companies are willing to take. While the approach appears simple, its value is in focusing on directional approaches. You might ask: Why not develop complex Big Data models? Mainly because there is insufficient data to do so. Simple approaches are best.

Recall how public officials made hard decisions during the pandemic. Throughout they largely focused on minimizing one key operational metric that they wanted to get below one—the average number of people infected by each person contracting the virus. Even after over two years of the pandemic, they don't really know what that metric is.

However, from the beginning of the pandemic, they made decisions based on reducing the number of infections, applying whatever little information they had at the moment. They constantly advised: lockdowns, mask wearing, vaccinations and limiting meeting sizes. These decisions were based on common sense, not on complex models. These are the types of models required to support decision making under uncertainty.

*****

1. *L. Lapide, "Under uncertainties: Quick response, not only S&OP,"* Supply Chain Management Review*, Mar/Apr 2022*

2. *L. Lapide, "Decision making under uncertainty,"* Supply Chain Management Review*, Mar/Apr 2021*

3. *L. Lapide, "Supply chain heroes and lessons from COVID-19,"* Supply Chain Management Review*, Sep/Oct 2020*

4. *L. Lapide, "Annual e-tailing update: COVID-19 virus shakeup,"* Supply Chain Management Review*, Nov 2020*

5. *Barry Render, Ralph M. Stair, Jr., and Michael E. Hanna,* Quantitative Analysis for Management (11th Edition)*, Pearson 2012*

6. *L. Lapide, "Optimizing decision making under uncertainty,"* Journal of Business Forecasting*, Spring 2022*

Measuring reusable packaging performance in omni-channel networks

Eva Ponce, Ph.D., is director, omni-channel distribution strategies, MIT Center for Transportation & Logistics. She can be reach at eponce@mit.edu.

By Eva Ponce

Omni-channel supply chains in the retail industry have evolved rapidly over recent years in response to shifting consumer demands. At the same time, the shift toward circular economies is gaining momentum as countries and companies set increasingly ambitious sustainability goals. How can omni-channel support the development of circular supply chains?

One way is to create reverse flow channels that collect returned product and packaging for recycling and reuse. The retail industry is actively developing these reverse supply chains, but one of the challenges they face is how to measure the impact of reuse strategies on omni-channel operations.

Research underway at the MIT Center for Transportation & Logistics' Circular Supply Chain initiative highlights the importance of establishing key metrics to the future success of reusable packaging strategies in retail. A case study in the grocery business reveals the effectiveness of packaging return systems in improving sustainability performance and the implications for the efficiency of omni-channel retail networks.

Grocery retailer study

Reusable packaging is a vital component of sustainable supply chains. Product packaging uses huge quantities of material resources and is a significant source of municipal and industrial solid waste. For example, it is estimated that in Europe packaging uses 40% of plastics and 50% of paper while contributing 36% of solid municipal waste. Reuse is an obvious way to mitigate this waste, yet most packaging is designed to be disposed of after a single use.

The problem is especially apparent in the retail business. The unrelenting growth of e-commerce generates increasing quantities of packaging waste. More broadly, reusable packaging reduces the pressure on critical resources, cuts waste and helps to realize the vision of a circular economy.

However, capturing these benefits depends on the characteristics and performance of reusable packaging systems. To create systems that are both effective and viable, omni-channel retailers must be able to measure return channel performance and link these measurements to the overall performance of their retail networks.

As part of our research to help retailers accomplish these goals, we completed a case study based on an omni-channel retail company in the grocery business with hundreds of outlets and an expanding e-commerce fulfillment network. Online orders can be delivered to customers' homes or picked up at stores. Local couriers deliver same-day orders, which are packaged in cardboard boxes. Customers can use these same boxes when picking up orders at stores.

The retailer has set ambitious targets for reducing the environmental impact of its supply chain, and one of the areas it is focusing on is packaging. Our analysis assessed the feasibility of replacing single-use cardboard boxes with two types of reusable packaging: a semi-rigid, insulated tote, that can be collapsed when empty to save space but is rigid enough to carry product in transit, and a rigid plastic box with a wall structure that could be composed of a single plastic material or a plastic corrugate.

Switching to reusable packaging raises a number of operational challenges. The reusable units must be collected from customers and returned to stores and other locations where they can be redeployed. Such a reverse flow requires transportation services as well as processes to receive, inspect, repair (when needed), clean and prepare the packages for reuse.

Green benefits and costs

The case study looked at these challenges across a number of dimensions. Let's look at two that provide useful insights into how the performance of a reusable packaging system can be evaluated.

Environmental performance. This is a key metric for any closed-loop delivery system. For this case study we looked at the greenhouse gas (GHG) footprints of the different packaging options under review.

Lifecycle analyses show that upstream manufacturing and fabrication accounts for most of the GHG's associated with product packaging. The advantage of reusable options is that the emissions generated during the upstream production phase can be spread out of the packaging's multiple life cycles. Single-use packaging, on the other hand, does not offer this advantage.

An important question is how many times must a reusable package be deployed to improve on the total lifecycle GHG emissions of a single-use alternative? Much depends on the material used in the packaging. For example, in the logistics system we evaluated the break-even point for a polypropylene box is 61 cycles compared to a standard cardboard box, 81 cycles compared to a cardboard box made from post-consumer fiber and 32 cycles if the reusable box is made from post-consumer plastic. For the woven-polypropylene bag, the break-even point is only two cycles and one cycle if the bag is made from post-consumer polypropylene.

Calculations like these have significant operational implications, because the number of cycles required to reach break-even equates to the number of times a reusable unit has to be returned to the store.

Total logistics cost. Another important metric is the total logistics cost of the reusable packaging system. This indicator enables retailers to assess the system-level economic impacts of their delivery networks. Costs vary with the way logistics systems are configured. In the network we analyzed, retail stores operate as e-commerce fulfillment locations where orders are picked, packed and staged for delivery.

We calculated the total logistics costs for six scenarios, including one store for both one month and 12 months of operations, and 400 stores for 12 months of operations. In each case we considered three different reusable package prices. Our findings show that costs can vary widely. The total cost per order is between $1.10 and $3.50 depending on the type of packaging used.

Additionally, we evaluated the system's sensitivity to several key parameters in the model including loss rate, or the number of packages not recovered from customers. Loss rates can vary widely one from retailer to another. For example, in our research we found that a German retail company collects 99% of its reusable, polypropylene boxes. Importantly, the company levies a refundable deposit to encourage consumers to send boxes back. Another German retail company only collects 36% of the boxes it dispatches, but it does not charge a refundable deposit or offer any other incentive for returns. It appears that customer engagement has a significant influence on returns rates.

In the system we analyzed, we found that total logistics cost is sensitive to loss rate and package price. For instance, for a $1 package, the total cost is insensitive to loss rate, but for packages that cost $2 or more the sensitivity rises.

The analysis also suggests that other parameters buffer cost sensitivity as package price rises. One example is backhaul cost—the cost of collecting packaging via one of the transportation options favored by the retailer. In the system we examined, when the number of packages that incur backhaul cost increases from 10% to 50%, the additional costs buffer sensitivity to loss rate. A notable implication is that as backhaul costs rise it can be cheaper to accept the loss of certain reusable containers and purchase new ones to replace them.

Added benefits

In addition to helping retailers understand how the benefits of reusable packaging systems can be evaluated, the case study also highlighted some less obvious advantages of these systems.

In the case of grocery delivery, this type of packaging could increase the sale of fresh and frozen foods by extending the delivery radius of networks. More robust packaging with better thermal performance affords more protection for perishable items, thereby improving product quality.

The research also highlights some key challenges. The complexity of creating reverse logistics flows is one such challenge, especially when it comes to managing the movement of packages. For instance, employing relatively robust, expensive units and failing to recollect them can significantly undermine the economic viability and environmental performance of the system. Also, we found that evaluating the economic impact of reusable packaging can be particularly challenging because it requires a product-specific approach.

Another important consideration is customer engagement. Creating incentives for returns such as refundable deposits appears to improve return rates, but it also adds cost to the system. Communications—especially messages that explain the value of circular packaging systems—can help to drive customer engagement.

The project also highlights opportunities for further research. For example, more work is needed to implement and empirically test the metrics we evaluated. According to one study we looked at, most metrics systems for the management of circular supply chains are in the early development phases with only 20% in implementation and 10% in use.

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For more information on the research underway at MIT CTL's Circular Supply Chain initiative please contact the author.

The CPO balanced scorecard

How to leverage enterprise synergies in sourcing and procurement.

By Chand K (CK) Raina

There's no debate that cost effective sourcing contributes to a strong bottom line, yet businesses are currently facing many challenges to effective procurement and operations. Still, in many cases, resistance to change and corporate inertia result in organizations continuing to use highly distributed and "non-synergistic" systems. Even more challenging is the case of mergers/acquisitions, where corporations maintain existing systems to provide an illusion of a "business-as-usual" feel to internal stakeholders.

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CPOs and CFOs across organizations, irrespective of size, type of business or growth strategies, need to align procurement with the vision of their organization. The most critical issues are disparate focus and incongruous strategies. The decision process for effective sourcing can not only be complex, but daunting. Critical to success is the decision related to the degree of centralization required within the procurement organization.

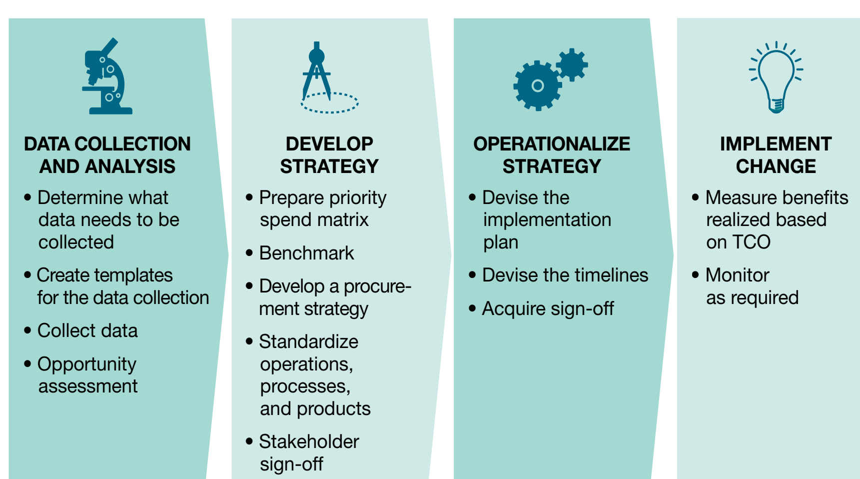
Centralized procurement lends a strategic advantage to organizations through economies of scale and collective buying power. However, in some cases a federal, coordinated or center-led structure works better. These models allow individual business units to act autonomously and minimize corporate overhead. However, due to lack of coordination each unit may end up with different prices and contractual conditions for the same supplies. How organizations can define their procurement models is a critical process.

Another challenge to securing effective sourcing is to create the right technological support for the supply chain. Distributed systems lead to technological challenges hampering organizations in their efforts to leverage cloud technology to their benefit. When creating common procurement systems, organizations need to choose the right technological platform and IT systems. The system needs to be flexible enough to ensure that variances in locations, regulations and categories are fully accounted for.

The right approach is to acquire a thorough understanding of the organizational dynamics affecting effective procurement. In our experience, an approach to innovation, as shown in Figure 1, requires an in-depth analysis of target elements, and a study of industry best practices and benchmarking. The results of the analysis are used to create a synergetic approach that aligns procurement goals with the organization's goals.

FIGURE 1

Approach for synergizing procurement across an organization



Creating procurement synergies in a distributed environment

A geographically dispersed organization that has seen inorganic growth typically tends to have distributed systems across several functions that create a procurement challenge in maintaining discipline and effective governance leading to reduced margins. In the case of acquisitions or mergers, organizations need to focus on creating synergies between different locations/geographies, businesses, cost centers, commodities and categories. Synergizing processes and systems across various organizational units involves:

1. identifying gaps in current systems and processes using spend analysis;
2. benchmarking expenditures for various industry verticals; and
3. developing a long-term focus on procurement processes.

To support the new processes effectively, the organization requires the deployment of appropriate synergetic governance, IT platform and systems.

Spend analysis: Identifying gaps in the existing system

Spend analysis is the understanding of expenditure data to reduce procurement costs and improve efficiency. Starting with the formulation of a hypothesis to achieve the expected outcomes, various objectives of the analysis are to categorize the spend to ensure aggregation/consolidation benefits or create categories to get the industry set benchmarks to understand how an organization is performing with respect to best in class performance. A cross-functional team (CFT) with relevant expertise and stakeholder participation is needed for outlining the hypothesis and validating it.

Stage 1. To define the hypothesis, the team details both known and unknown elements within the set of defined processes while executing the operations within the organization. Start by constructing a 2x2 matrix as shown in Figure 2 to understand the high-level state of processes within the organization with the aim to move all items to the fourth quadrant.

FIGURE 2

Matrix for identifying the gaps in the existing procurement processes and systems

	Knowns	Unknowns
Unknown	1 UNKNOWN KNOWNS	2 UNKNOWN UNKNOWNS
Known	4 KNOWN KNOWNS	3 KNOWN UNKNOWNS

Source: Author

The organization requires a different strategy and solutions for each of the quadrants. Starting with the third quadrant (known–unknowns), accelerate identification of an appropriate strategy to address the issues relevant to that quadrant.

Stage 2. Conducting a deep dive into process and operations improves an understanding of the procurement operations and item/product category unit costs across the organization.

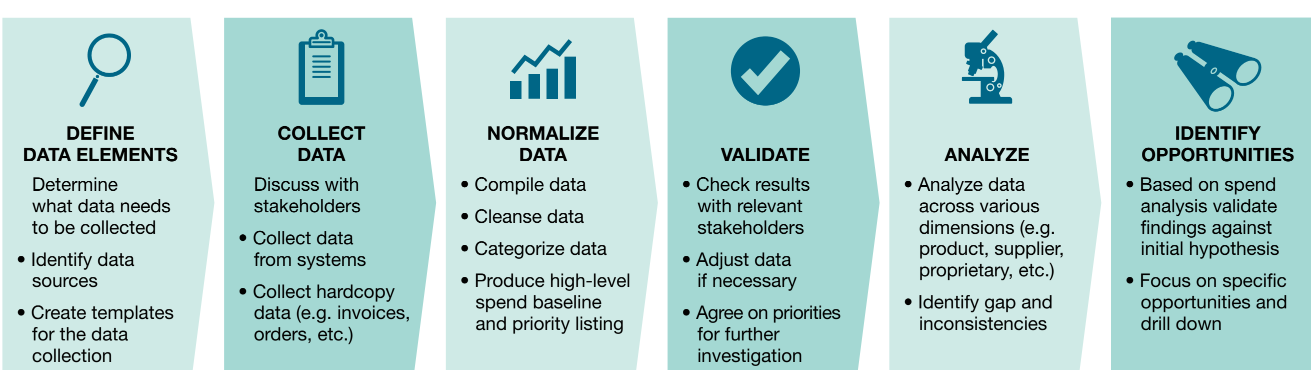
The next set of steps require a little more effort—data needs to be collected from each business unit across regions, practices and organizational structures. The recommended process for the CFT to collect suitable data and analyze it for identifying opportunities for synergetic procurement is shown in Figure 3.

There are two important factors to consider in the process.

1. Functional commonality of each item/category as

FIGURE 3

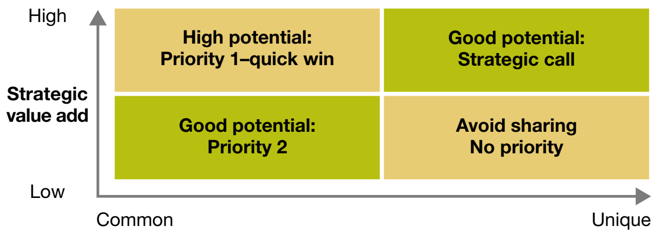
Framework for identifying opportunities that create synergies in procurement



Source: Author

FIGURE 4

Strategic value priority matrix



Source: Author

determined by a functional analysis. The results of the analysis will help build a functional hierarchy, show dependencies and identify any missing functions.

2. Potential strategic value of the item/category adds to the organization depending upon the core industry segment of the organization. For example, in an automotive manufacturing company bearings or motors have high strategic impact value whereas in another industry they may be MRO items.

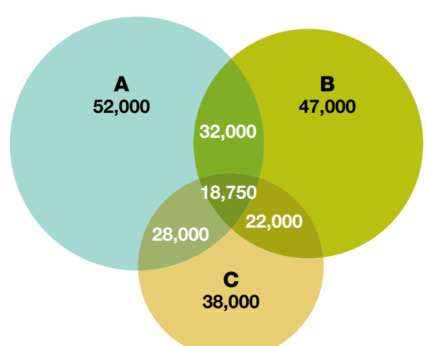
The analyzed categories should be plotted on a 2x2 strategic priority matrix as shown on Figure 4.

Stage 3. Finding common line items between various units and addressing them first as in Figure 5. Numbers in each section represent the number of line items within the respective units of the organization. The commonalities identified between the units should be targeted to achieve synergies within the organization.

In Figure 5, we observe that over 36% (18,750) of items of Unit A are common with 40% of items in Unit B and 49% items in Unit C. This overlapping portion should be targeted first.

FIGURE 5

Plot commonalities between units to decide specific items to target



Source: Author

Benchmarking to understand best practices and designing synergies

At this point, the current state of units have been fully documented. This is followed by the visualization of the potential state of the item or unit as foreseen by the hypothesis. It is important to understand the target state that synergies can help the organization achieve. The graph in Figure 6 depicts an example of comparing the current and the potential states.

Having defined the potential state, the CFT needs to understand and devise the best procurement practices for execution. Important points to be considered are:

- organizational structure;
- value engineering;
- strategic sourcing;
- contracting; and
- technology support.

Overall organizational structure. During the benchmarking assessment, it is critical to scrutinize the purchasing model that will work best with the existing organization structure, depending on the size and network in which the organization's procurement function operates.

While it is tempting to adopt a center-led procurement strategy after a merger/acquisition, an in-depth analysis helps identify the best fit for the organization. Depending on the results of the analysis, management can consider other models such as decentralized, federal or coordinated sourcing structures.

Potential value engineering. Value engineering must target product and process portfolio standardization across the organization to enhance functionality and reduce costs. The CFT must define the parameters of valuation for each unit, bundle the quantities as needed and identify and rationalize the terms and conditions of each unit. The CFT can take the approach suggested in Figure 7.

Strategic sourcing. The CFT must exercise due diligence while identifying categories based on the availability of aggregators and acquiring a vendor base capable of catering to the maximum number of requirements. Among other things, the RFI should cover aspects of quality, cost, delivery, design, management and finance, including TCO, Risk and ESG elements.

Contracting. The design of contracts in a synergetic atmosphere is challenging since centralized contracts are not always possible. Challenges also arise due to varied tax structures and regulations in different geographies, and complexities in deliveries. In such cases, instead of a fully centralized model a center-led approach can be adopted.

Technology. The right technology adoption supports the creation of synergies. If the procurement strategy is formulated properly, choosing the right technology helps achieve significant cost savings. For instance, e-procurement and/or cloud deployed technology helps garner bottom-line benefits for an organization.

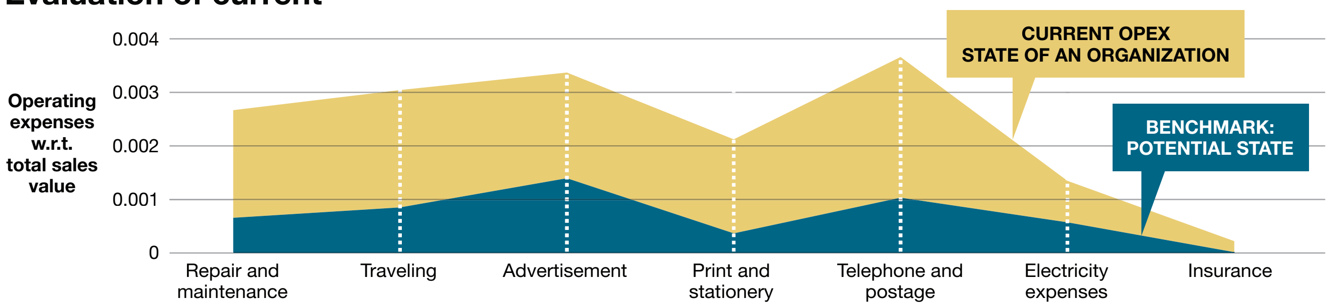
The bottom line: Synergetic procurement processes produce strategic results

Organizations must treat procurement as a global function. This is especially true in the case of acquisitions or mergers. Creating synergies between locations, commodities, categories and processes requires organizations to leverage industry best practices along with disciplined program governance.

Synergizing procurement processes across the organization

FIGURE 6

Evaluation of current



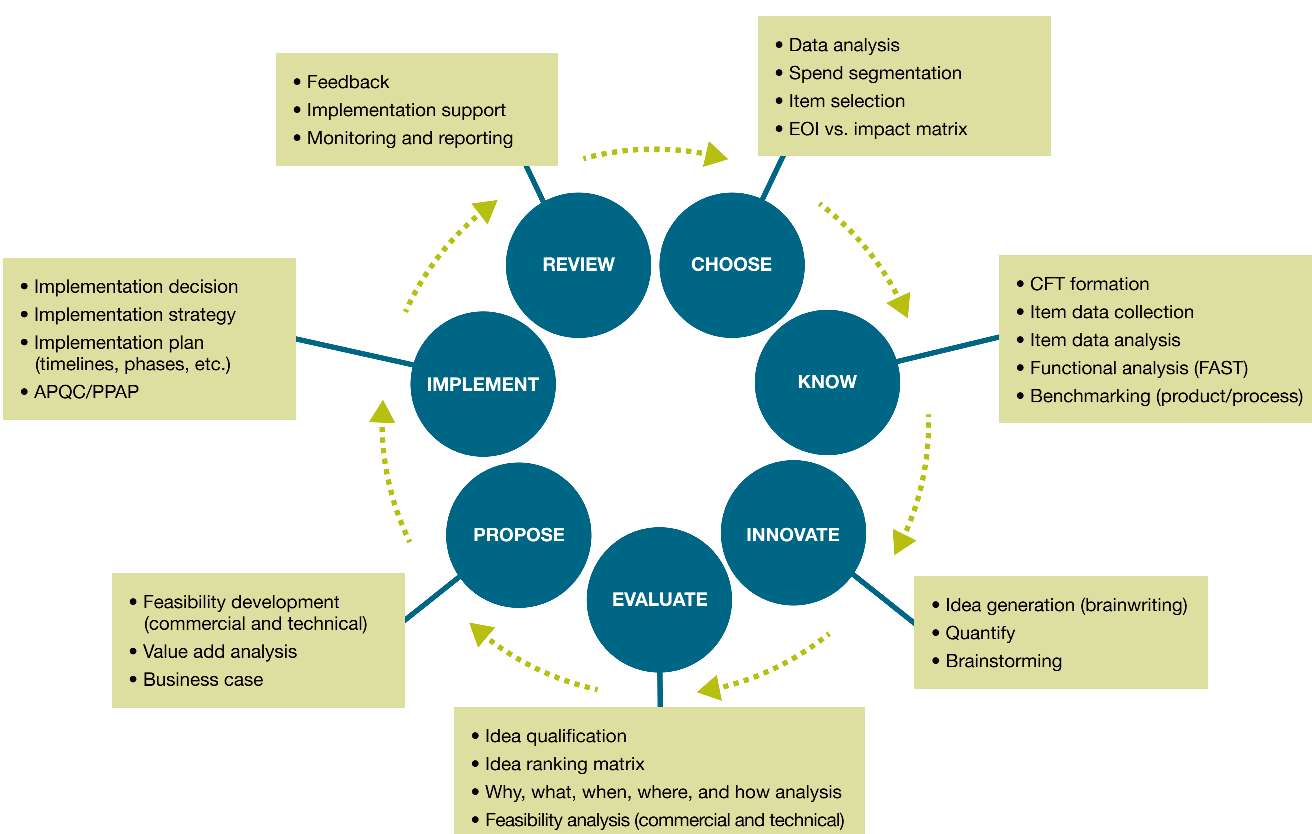
Source: Author

helps to achieve the following benefits.

1. Bundling volumes of same function, specification, items and categories to gain economies of scale and continual productivity.
2. Strengthening centralized control on global strategic buys while decentralizing on local needs to align with organization structure.
3. Enhancing spend under management, leading to stronger control on contracts and reduction in saving leakages.
4. Focusing efforts on controlling and optimizing direct and indirect spend.
5. Implementing global best practices and benchmarking organization processes to enhance procurement.
6. Forming strategic relationships with vendors, locally and internationally, to achieve mutual benefits.
7. Creating a common technology platform to support implemented procurement processes.

FIGURE 7

Suggested approach for potential value engineering with inputs from functional analysis and benchmarking



Source: Author

MAKING THE CASE FOR

Tooling Digitalization

With 92% of all OEMs using spreadsheets to collect, review and share tooling data, it's time for manufacturers to get into the 8% by digitalizing their molds, dies and other tooling.

As global organizations adopt more automation and implement technology that replaces their manual business processes, tooling remains an area that's largely left up to chance. In fact, 92% of original equipment manufacturers (OEMs) still rely on spreadsheets to collect, review and share tooling data.

This creates massive inefficiencies, holds up production and throttles throughput for manufacturers that are under extreme pressure to get their products to market on time.

To avoid these and other problems, the dies, molds, jigs, gauges, cutting equipment and other tooling must be in the right place at the right time and fully operational.

When any of these boxes are left unchecked, the end result will be improper or dysfunctional tooling that directly impacts output capacity, quality, product lifecycle and costs.

MANUAL DATA MANAGEMENT DOESN'T WORK

Spreadsheets don't work for businesses. Not only do they take time (and manual effort) to populate, manage and share, but spreadsheets don't store historical data, are hard to analyze and too easy to change (sometimes incorrectly, thus increasing the risk of error).

The small organization with a single location and few external partners may get away with using spreadsheets to manage specific aspects of its business, but the global manufacturer with multiple locations, business partners and customers needs a more streamlined, automated and reliable way to manage its tooling.

"The manufacturing business model used to be organized and operated on a regional basis, but it has since expanded into a global relationship, where the production change moves between countries," says Dr. Mason Lee, senior data scientist at eMoldino, developer of a cloud-based solution that connects tooling via an artificial intelligence-driven analytics platform and that provides real-time, global visibility on tooling status.

"The situation puts OEMS in a position to be more exposed to limitations in the supply chain, including manual information collection and a lack of global communication," Lee continues. In the past, for example, companies collected data manually without too much of a problem because their focus was likely on regional production.

Now that these OEMs are operating on a global scale, speed of operations has become critical and manual data collection is completely inefficient. When the same OEMs digitalize their tooling, they get real-time tooling data, clear visibility and better collaboration within manufacturing processes and across the entire supply chain. Other key benefits include major efficiency gains, enhanced data accuracy and optimized procurement practices.

EMBRACING A NEW PARADIGM

The emergence of the Internet of Things (IoT) and artificial intelligence (AI) has driven increased application of technology in production management, where the push is on to get processes digitized and automated. Both OEMs and suppliers are using real-time IoT technologies to gain visibility and agility, for example. "This is emerging as a new paradigm for manufacturing value chains," says Lee.

As evidenced by the 92% of OEMs still using spreadsheets to manage their tooling data, the path to establishing a digitalized system for collecting and sharing production data isn't always clear. There are many prerequisites to maintain and accomplish this feat, says Lee, which requires a mix of devices, IoT sensors, support, installation services and implementation at individual production sites.

"Implementation can be difficult and a potential barrier," Lee points out. Despite these perceived obstacles, the benefits of digitalizing tooling data are very clear. At a fundamental level, production efficiency suffers when the data collection process is based on manual methods of checking and entering the tool mold status and production status into a computer.

This not only creates the potential for human error, but also the risk of documenting inaccurate data about assets and production patterns. "Since the data isn't collected automatically," says Lee, "there's a lack of visibility and potential for inaccurate production management."

Using the "garbage in/garbage out" idea—whereby computers fed incorrect or poor-quality inputs always produce faulty outputs—as an example, Lee says no matter how digitalized a system is, if the data is incorrect, everything will be wrong. Knowing this, he says digitalized methods of transmitting and pooling production data is a key issue for all OEMs right now.

"Using IoT sensors and AI, manufacturers can prevent data contamination," says Lee. "And because the data is collected and analyzed in real-time, OEMs can check it and take immediate action when a tooling problem arises." This, in turn, speeds up the production process, enables faster time to market and allows for quick attention to quality concerns.

This Making the Case explores the key challenges that OEMs face when they run their tooling operations on spreadsheets or other manual processes, showcases tooling digitalization in a real-life "before and after" case and outlines the top benefits that manufacturers get when they decide to join the 8% of OEMs that have made the switch to digitalized tooling processes.. •

COVERED IN THIS REPORT:

- **How tooling digitalization optimizes supply chain management**
- **Don't take the risk on the wrong tooling data**
- **What tooling digitalization looks like in action**

Go to: **www.scmr.com/emoldino_mtc20221** for the complete report.

Don't let negotiations upset the apple cart

When it comes to successful negotiations, a buyer's history with a supply chain partner creates expectations. Any changes in that negotiation strategy can create confusion, as buyers search for explanations for deviations. Here are suggestions for actions to take when dealing with a turbulent supply chain environment.

BY STEPHANIE P. THOMAS, MONIQUE L. MURFIELD AND JACQUELINE K. EASTMAN

Taylor, a buyer for a big box retailer, has been working with a supplier counterpoint, Sam, who works for a major manufacturer. Their negotiation history has been stable, and Taylor appreciates knowing how the negotiation process will go each year. This year though, the negotiations went very differently, leaving Taylor to question the reason for the changes. Taylor is wondering if previous perceptions of Sam and the manufacturer are accurate. Taylor questions if the trust in Sam is misplaced, and if Sam's organization has the same level of commitment and sees the same value in the business relationship that Taylor's firm does. Going forward, Taylor has questions and is unsure of how to proceed with future negotiations with this manufacturer. He doesn't want negotiations to upset the apple cart.

For a buyer working in supply chain management to say their world has become more turbulent is a vast understatement. Many buyers may find themselves in a scenario similar to the one faced by Taylor. In this era of never-ending change, there is a practical need for supply chain buying managers to consider the relationship history with their key suppliers and their strategic expectations so that they can better understand and predict potential supplier negotiation behaviors and outcomes when environmental changes occur, both internal and external to their organizations.

Some buyers may have a collaborative (win-win) strategic situation with their key suppliers, in which there is information sharing and concern for the success of both firms. Other buyers may be facing a competitive (win-lose) strategic situation, where their suppliers emphasize their

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own short-term gains. After repeated negotiations, buyers learn to adjust to their suppliers' negotiation styles given their past history. What happens then to buyers' levels of trust when suppliers change their negotiation strategy to a different style after a history of doing it the same way?

Further complicating buyer-supplier relationships are environmental forces or changes, both internal and external, that are out of the control of the buyers and suppliers alike. Internal changes could include new executive leadership within the supplier organization that changes a strategic emphasis either toward or away from more long-term collaboration with their buyers. And, externally, these changes could include items such as price changes—either higher or lower—in key product components.

These types of changes occur in the chaos that supply chain managers have faced recently as they contend with the pandemic, the growth of inflation, global unrest and the "Great Resignation." Given that a buyer's relationship history with a supply chain partner creates expectations, any deviations in negotiation strategies create confusion and questions. For instance, what happens to the value of the relationship and the commitment to the relationship when environmental changes occur? Further, how is the supply chain relationship affected when, in addition to these internal or external changes, there are also changes in negotiation strategy behaviors?

Those are some of the questions we will address as we discuss the importance of intentional negotiation strategy selection and its relational impacts. Finally, we will provide suggestions for key actions that supply chain managers can make in dealing with a turbulent supply chain environment, based on a series of experiments with experienced supply chain managers.

Negotiation strategy selection has relational impacts

Negotiation strategy behaviors have been a popular area of study. Research has often sought to identify an optimal negotiation strategy, with two styles dominating negotiation studies. The competitive approach is characterized as being most appropriate in transactional negotiation encounters and negotiators tend to withhold information and avoid identifying mutual interests. The collaborative approach involves cooperation, the open exchange of information and a desire to achieve mutually beneficial outcomes.

These two negotiation styles are often viewed as opposing ends of a continuum. Proponents of close supply chain relationships have favored the use of the collaborative approach by buyers and suppliers. However, research has been split on which strategy "wins" in terms of negotiation outcomes.

Results often depend on negotiation outcomes being measured based on one negotiator or the pair. A competitive strategy is optimal when looking at a single negotiator while collaborative behaviors perform better when basing results on the buyer-supplier pair. A shortcoming of previous research has been the study of the negotiation of two strangers in a single encounter. This may be appropriate if you're looking at a one-time deal, but it's not realistic when it comes to studying long-term relationships.

From the first time a buyer and supplier sit across from each other at the negotiation table, both sides have researched and prepared in advance and made specific choices about how they will approach this situation. These initial decisions create the foundation for which all following negotiations will build upon. Being thoughtful and intentional about what the future could be between the two organizations may help avoid issues down the road.

History creates expectations in buyers

Many buyers and their organizations have been doing business with their supply partners for months, years and even decades. Across the negotiation table, they have ironed out the details related to important business decisions like product selection, payments terms, lead time, volume discounts, exclusivity deals, performance expectations and more. Each time a buyer negotiates with an established supplier, they add that experience to all previous negotiation experiences. As this continues over time, the buyer develops a relationship history, which creates expectations for future negotiation behavior. Those expectations give the buyer a sense of certainty and ease about the relationship between the two organizations and enable the buyer to prepare confidently for future negotiation encounters.

Regardless of the way a supplier approaches their negotiations, competitively or collaboratively, buyers like knowing what to expect. This research examined the impact of changes in negotiation strategy within a buyer-supplier relationship over time, which we discuss next.

Change creates confusion

Regardless of the type of negotiation strategy that a supplier partner has used in the past, our research found that buyers appreciate and expect consistency. When a supplier partner behaves in an unexpected way during a negotiation, it causes cognitive conflict for the buyer and plants seeds of doubt about the future of the relationship. Our research found that any unexpected negotiation behavior change had a negative impact on the buyer's feelings of trust.

Let's go back to our buyer, Taylor, from the beginning of the article. Let's say that Taylor expected Sam to behave in a competitive way during their negotiations because that's how Sam has traditionally behaved. However, this time, Sam uses a more collaborative approach.

You would expect that Taylor would embrace this new style, especially if Taylor desires to build a more collaborative relationship with Sam. However, we found that buyers were skeptical of this type of behavior change, and that their levels of trust were lower when suppliers used a collaborative approach in this type of scenario than if they used their traditional competitive approach. Traditionally, trust levels are higher when a collaborative negotiation style is used. But, we found that when an unexpected change happens, this isn't the case.

Conversely, we found that if Taylor expected Sam to behave in a collaborative way and Sam behaved in a competitive way, Taylor would react negatively to the change, and lead to questions related to trust. However, this change elicits a stronger negative reaction than the reaction to the competitive to collaborative example. When buyers are confused, they question the trust they have built with their supplier partners and reconsider their commitment and perceived value of the established buyer-supplier relationship. Thus, our research found that negotiation strategy changes have an impact on trust.

We also wanted to consider how other relational factors are affected, such as the level of commitment and the value that a buyer places on a relationship. We conducted additional research to determine how a relationship is affected if there is a reason for a change in negotiation style.

The quest for why?

When a supplier behaves unexpectedly during a negotiation, buyers want to understand why their partner behaved differently, especially if the relationship between the two organizations is important to the buyer and the buying organization's success. Research and theory from psychology explain the buyer's need to understand the cause of an unexpected change in negotiation strategy, to know whether it was within the control of the other negotiator and if this change is likely to be a short-term change or permanent change.

To determine these things, the buyer may look for forces outside of the relationship, known as "extra-relational factors," to help explain the suppliers' unexpected negotiation behavior. These factors can be organizational, which are inside one of the organizations but outside of the buyer-supplier relationship, or they can be external factors, meaning outside of the relationship and the control of both organizations.

Our research found that these extra-relational factors do help buyers to cognitively process unexpected changes in negotiation strategy. However, results differ depending on the type of extra-relational factor (organizational or external) and the type of relational outcome (commitment and relational value).

Our results show that when a positive organizational factor is identified, such as a new leader in the supplier organization with a collaborative approach, this positively affects the buyer's perception of commitment and relationship value. This is also the case when a buyer identifies a positive external factor, such as lower raw materials prices, to help explain unexpected changes in the negotiation approach. This research supports prior research that suggests that the influence of these factors may be different for different relationship outcomes, and they may alter the norms and buyer expectations for the relationship.

Let's refer again to Taylor and Sam. After becoming confused with the behavioral change from the recent negotiation with Sam, Taylor reads an article about new leadership within Sam's organization and learns that some drastic changes are being made in the way that Sam's organization handles the relationships with its buyers. With this knowledge, Taylor now understands that Sam's behavior change is likely due to initiatives from the new leadership and not from Sam.

Taylor may perceive this is as a potentially long-term change and be able to adjust negotiations accordingly. This helps to lessen Taylor's initial feelings of mistrust and feel more confident about continuing to engage with Sam. The impact on commitment and the value of the relationship will be more positive when the change is positive than when the change is negative. However, even if the change is negative, understanding why the change is occurring is helpful to maintaining the commitment and the value of the relationship.

Now instead of new leadership, let's say that Taylor the buyer learns about a swing in critical raw material prices, which might influence the change in Sam's negotiation strategy. If the raw material is a commodity like oil or cotton that tends to see increases and decreases, Taylor may assume that Sam's behaviors are short-term and will revert to Taylor's normal expectations when prices change. Like the internal change of leadership, the impact of an external change (like commodity prices) on commitment and the value of the relationship will be more positive when the change is positive than when the change is negative, but in any case, understanding the reason behind the change is helpful to maintaining the relationship. Thus, whether the change is being caused by internal or external factors, if there is a communication and understanding of why this change is occurring—even if the change is negative—the relationship will benefit.

What can managers do?

While unanticipated supplier behaviors can cause concern in buyers, there are some thoughts to consider to avoid damaging the

About our research

For this research on the relational impacts on negotiation strategy when changes occur, it was vital to utilize experienced supply chain managers with realistic scenarios. This was a done in a series of three scenario-based experiments based on Thomas' and colleagues' qualitative research with discussions with supply chain managers.

The first experiment focused on the negotiation strategy of collaborative and competitive negotiation strategy and what happens when those expectations change. In the second experiment, we added an extra internal factor of new leadership being either more collaborative or competitive. In the third experiment, we utilized an extra external factor of a change in price of a key raw material used in the products purchased.

All scenarios were pre-tested with supply chain experts prior to their use and were tested and found to be realistic within the research. For each experiment, we utilized a Qualtrics panel to recruit 100 experienced supply chain manager participants with at least three years of buying or selling experience across firms of myriad sizes and industries.

All three studies had a diverse representation of gender, firm size and industry. The median age group for the respondents was 35 years old to 44 years old with a median experience level of five years to seven years. The relationship variables of trust, relationship value and commitment were measured based on established scales in the literature.

existing buyer-supplier relationship.

- **Be intentional from the beginning.** The longer that buyers and suppliers have been doing business together, the more history they have. That history develops over time. As companies start doing business together, they need to carefully consider how they approach their negotiations and realize they are laying a foundation and creating expectations that buyers will rely on as the organizations continue to do business together.
- **There's more than one encounter at the table.** Both buyers and suppliers should have a holistic approach to a negotiation encounter. They should consider this isolated event within the context of the broader, ongoing supply chain relationship. As both sides prepare for an upcoming negotiation, they should consider how the other side is going to perceive their negotiation approach. If a supplier is planning to deviate from their "norm," they need to consider how the buyer might interpret this change and how they might react. If the buyer reaction may be negative and could be detrimental to the way the organizations currently work together, then the supplier might reconsider the switch in approach.
- **Unexplained change will negatively affect the relationship.** There are many quotes about humans being "creatures of habit." Buyers buy into that belief. Logic might suggest that if a supplier shifts from a competitive bargaining approach to a more collaborative bargaining approach that a buyer would welcome this new behavior, especially if they have been seeking a more collaborative relationship. This research suggests that is not the case. This change is met with a more negative view of the relationship from the buyer. Unsurprisingly, buyers do not appreciate a change from being more collaborative to more competitive either. The takeaway: Change is bad, which is why planning and behaviors at the beginning of a buyer-supplier relationship are so important.
- **Change drives curiosity.** When a supplier negotiation unfolds in an unexpected way, the buyer is left with questions. Instead of just accepting that this inconsistency happened, and the history of business is all null and void, buyers will seek answers. They want to explain and come to terms with the negotiation experience so that they can process it with the rest of the relationship history and consider how to move forward.
- **Disclosure can do damage control.** If you are going into a negotiation and know that you are going to behave in a way that differs from previous negotiation behaviors, explain your change to your negotiation partner. This explanation may occur outside of the actual encounter—before or after—but the explanation will speed up the other negotiating partner's cognitive processing of the unexpected behavior and will minimize the overall relational impact.

Negotiations play an important role in the development and success of long-term buyer-supplier relationships. However, a short-term, individual encounter lens has often been used when preparing for bargaining situations. As the world of supply chain management continues to change rapidly, consistency and open communication will be key for building trust, commitment and valuing the long-term success of any buyer-supplier relationship. Let's hope supplier Sam reaches out to Taylor the buyer and explains the changes in their negotiation behavior so that an understanding of why the change is occurring can help get their relationship back on track.

The ABCs of competitive bidding

The next time you go to market, make sure you are using the most appropriate competitive bidding method to help you get the best results.

BY KATE VITASEK, BONNIE KEITH, JEROEN VAN DE RIJT AND ANDREW DOWNARD

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Every day, hundreds of organizations conduct competitive bids to pick the best supplier to meet their needs. Unfortunately, too many organizations are using the wrong tools for the wrong job—often resulting in selecting the wrong supplier or developing a contract misaligned with the organization's objectives. Simply put, using the wrong competitive bidding method is like putting a square peg in a round hole. Forcing it to fit is myopic and inefficient.

To further complicate things, newer more collaborative approaches have emerged that tout the benefit of allowing buyers to gain insight and improved supplier innovation. The question arises: what is the right competitive bidding tool for my situation? Today's sourcing professionals should understand and enthusiastically embrace the entire suite of tools in their sourcing toolkit and carefully select the method that is most appropriate for their situation.

The changing landscape of strategic sourcing

The COVID-19 pandemic has taught organizations that they must maneuver in a changing environment that is more dynamic than ever. They must embrace and evolve with modern business needs; more and more this means balancing what seems to be insurmountable, conflicting goals of reducing cost structures and increasing flexibility while driving innovation and mitigating risks.

Unfortunately, the tried-and-true tools and tactics adopted as the gold standard over the last 30 years are no longer as effective as they once were. One of the gold standards being challenged is the purpose and nature of conventional competitive bidding tools. For centuries, organizations have thought of procurement as a "make vs. buy" decision. This was especially true as organizations began to explore outsourcing. Many falsely assume that if they buy, they should use competitive market forces to ensure they are getting the best deal. In doing so, the default approach is to use a transaction-based model. This works well for simple transactions with abundant supply and low complexity where the market can correct itself. After all, if a supplier does not perform, just rebid the work.

However, as organizations outsource and procure more complex goods and services, this logic no longer works. All too often buyers become co-dependent on suppliers, switching costs are high and suppliers have a locked-in position. Take the movement of Global Business Services (GBS) as an example, where organizations centralize and often develop large scale outsourcing contracts for facilities management, finance, IT and procurement. Often, activities are bundled and provided by one supplier in an effort to drive efficiencies, economies of scale and innovation. Sourcing in this environment is very complex, and, when done in the wrong way, the risks simply become too large.

In a transaction-based model, the buyer likely will not get any value beyond cost savings, as many RFx methods focus only on price according to the specification of what is being asked for. In an increasingly globalized and competitive world, companies are indeed looking for value beyond just cost savings when it comes to complex goods and services—including attributes such as innovation and flexibility.

The result is a clear shift occurring in strategic sourcing to more strategic, performance-based and "Vested" outcome-based supplier solutions. This has resulted in organizations needing to use more sophisticated and collaborative RFx approaches that seek to buy solutions, business outcomes, strategic partnerships or alliances.

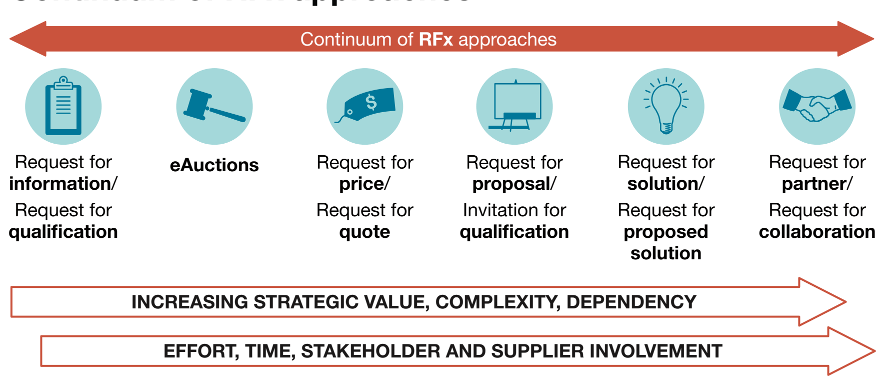
Understanding the tools in your toolkit

As organizations seek more strategic solutions from suppliers, they must also consider more strategic approaches for competitive bidding that are essential when an organization strategically moves to more value-based sourcing business models. Today's procurement professionals should be tapping into a variety of competitive bidding methods. We suggest thinking of the various methods along a continuum ranging from limited collaboration to the most amount of collaboration. Figure 1 maps the various types of RFx methods along the continuum.

A key part of selecting the appropriate RFx approach is understanding the various types of

FIGURE 1

Continuum of RFx approaches



Note: RFIs and RFQs can be used in conjunction with other RFxs.

Source: Authors

RFx methods that can be utilized.

There are seven primary types of RFx methods, but often these methods have different names or terms. We have used the term that is most popular but also list alternative names used to describe the same or roughly similar concept.

Request for Information, RFI (also referred to as a market consultation). Used to obtain general information about products, services or suppliers. An RFI is sometimes used to gather benchmark information and general market data from the marketplace. Buyers rarely if ever pick a supplier based on RFI information; rather they use the information to help them further refine the RFx approach. As such, an RFI typically precedes other RFx processes and often is used to help a buyer to down-select the number of potential suppliers it will evaluate.

An RFI can be used with any of the RFx processes, but it is almost always used with a request for proposed solution and a request for partner process. Note that an RFI is not binding for either buyer or supplier. RFIs are sometimes combined with a Request for Qualification (RFQ, see below). RFIs range from simple requests aimed at gathering market intelligence to more comprehensive requests asking suppliers to answer detailed questions about their qualifications if combined with an RFQ.

An RFI is almost always coupled with one of the other competitive bidding methods.

Request for Qualification, RFQ (also referred to as a down-select, pre-qualification or selection phase). A process used to down-select a large pool of suppliers to a smaller list that will be asked to move to a more comprehensive stage of the competitive bidding process. RFQs range from simple questions about qualification (i.e., does the supplier have appropriate certifications and credit rating scores?) to more comprehensive requests asking suppliers to answer detailed questions about their qualifications. RFQs are sometimes combined with or follow an RFI.

An RFQ is almost always coupled with one of the other competitive bidding methods.

Electronic auction (e-auction). An online, price-centric auction where purchasers specify what they are interested in buying and prospective suppliers respond by entering competing bids. Often suppliers are pre-qualified to participate in an e-auction. There are various types of e-auctions. One common type is a reverse auction where a single buyer uses a fixed-duration bidding event in which multiple prequalified and invited suppliers compete for business. Potential suppliers review the requirements, choose to bid and enter their selling price(s) and other qualifying criteria as requested. In some reverse auctions, suppliers' prices are visible to other competitive bidders, often resulting in successively lower prices. Another common type is a seller-driven e-auction, which is an electronic, online auction where suppliers post items for sale and buyers bid on the items.

Request for Price (also referred to as a Request for Quote). Used to obtain price offers for a specified product or service. These are used for more standard acquisitions based on price or cost considerations. Buyers using a request for price must be sure to properly define the requirements so there is no ambiguity for the supplier. The law may or may not treat a quotation as a binding offer.

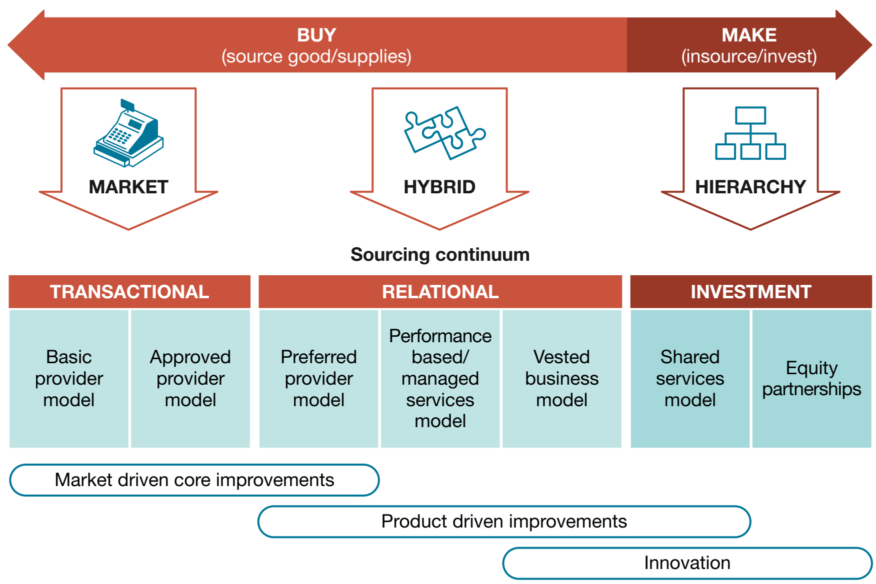
Request for Proposal, RFP (also referred to as an Invitation for Proposal [IFP]). Used to obtain pricing as well as detailed descriptions of services, methodologies, program management, cost and other support provided by the supplier. Requests for proposal are used for larger, more complex and technical solicitations where selection is based on factors beyond just price or cost, such as technical capability, capacity and potential shared design with the supplier. A request for proposal is often a follow-up to an earlier request for information (RFI). A request for proposal allows a buyer to specify requirements or high-level objectives and allows suppliers to begin to define some or most of the "how." For example, a buyer may ask a supplier to outline how it proposes to manage quality.

Request for Solution, RFS (also known as Request for Proposed Solution [RFPS]). A collaborative process in which a buying organization has a dialogue with potential down-selected suppliers with the intent of collaborating to determine the best solution to meet the buyer's needs. The buyer gives limited direction on what the solution may be and has a collaborative dialogue to define/refine the solution. The supplier then develops a formalized proposal that includes their solution. The European Commission's competitive dialogue process is one form of a collaborative request for solution.[1]

Request for Partner (also known as a Request for Collaboration or a Request for Mutual Value Solution). A highly interactive process used when a buyer is actively seeking not only a solution from a supplier, but also seeks a supplier with a high degree of cultural fit and compatibility. A request for partner is typically focused on selecting a supplier where there is a need for a high level of investment or collaboration between the buyer/company over a longer time horizon—such as a large outsourcing project that will require significant change for the buyer and supplier versus implementation of a more standard solution.

It is also important to note that most public (government) procurement professionals use a term known as Request for Tender (RFT). We have purposely avoided including this term because it is commonly used to represent one or more of the above types of competitive bidding methods. As such, it is the authors' view that the term Request for Tender can be confusing. Our experience is that most RFTs align with a request for proposal.

FIGURE 2
Sourcing continuum



Source: Authors

Selecting the most appropriate RFx method

The million-dollar question is: "What is an easy way to know what the best RFx method is for my sourcing situation?" We suggest that you use the following rules of thumb.

The book *Strategic Sourcing in the New Economy* suggests that organizations must first understand the desired sourcing business model, or sourcing continuum, illustrated in Figure 2.

Five of the seven sourcing business models have to do with working with external suppliers (the left "buy" side of graphic) while two of the models are investment-based (the right "make" side of graphic) and factor in creating a shared services organization and doing acquisitions/joint ventures.

As organizations shift along the sourcing continuum, they consciously choose to work more strategically with suppliers, that is, moving from working with a basic or approved provider to a preferred, performance-based or even the Vested business model. As the relationship becomes more strategic, the relationship dynamics with the supplier change to using contract structures that shift from transactional and commodity-based thinking to one based on more trusted, relational partnerships between the buyer and supplier. A key reason an organization would want to shift up to the sourcing continuum is to drive productivity improvements and innovation.[2] When this happens the supplier takes on risk such as painshare penalties associated with performance against service level agreements under a performance-based contract.

When determining the most appropriate RFx method, we recommend using the sourcing business model continuum in Figure 3 as a guideline—aligning various competitive bidding factors to each of the sourcing business models.[3]

FIGURE 3
Which RFx?

		Basic provider	Approved provider	Preferred provider	Performance-based/ Managed services	Vested business model
RULE OF THUMB for which RFx to use	RFI or RFQ					
	eAuction					
	Request for price/quote					
	Request for proposal					
	Request for solution					
	Request for partner					
FACTORS to consider when determining which RFx to use	Nature of goods/ service	Commodity	Commodity good or service	Tailored good or service	Solution focused (product + service or service only)	Solution focused (product + service or service only)
	Business need	Price	Price + assured quality	Best value	Best value + supplier expertise/ guaranteed supplier outputs (SLAs)	Best value + supplier expertise/ business outcomes + innovation + cultural fit
	Frequency of bid	Varies; monthly to annually	Every 1-2 years	2-3 years	3-5 years	5+ years
	Typical time needed to complete	Instant to 1-2 weeks	Instant to 3-4 weeks	4-8 weeks	2-6 months	2-6 months
	Stakeholder involvement					
	Supplier involvement					

Source: Authors

Shifting the continuum in practice

Telia is a Swedish listed telecommunications company and mobile network operator founded in 1853 that operates in Denmark, Finland, Sweden, Turkey and the Baltic States. Telia was the first company in the Nordics to pilot the University of Tennessee's Request for Partner process.

Telia's Tech Sites organization managed Telia's infrastructure across 16,000 technical sites covering four site types, including mobile network, fixed network, caves and tunnels. Previous sourcing decisions and re-organizations had resulted in more than 60 contracts supported by more than 20 suppliers. When Telia first set out to explore Vested for its infrastructure contracts, it did not know which of the 20 suppliers—if any—would be the right partner to pursue a Vested sourcing business model.

Telia kicked off its journey by having EY's Outsourcing Advisory Practice and the Cirio Law Firm conduct a six-week preliminary study that included more than 20 different functions within Telia. The pre-study revealed several key things. First Telia's numerous contracts were rooted in transaction-based models, which created a misalignment of goals. Telia had "stiff contracts" that were not flexible in allowing suppliers to optimize maintenance operations. The pre-study also uncovered how the exiting budgeting process led to Telia putting its money in the wrong places.

A key part of the pre-study was to validate which sourcing business model would be most appropriate for Telia. This meant completing a Business Model Mapping exercise. The findings? The complexity and dependency of Telia's operations demanded a clear shift to a relational contracting model. In addition, shifting to an outcome-based economic model would significantly help Telia unlock the potential value of working with a potential partner.

With the pre-study and business model mapping complete, Telia's leadership team decided to shift to a highly strategic Vested business model. However, Telia did not have an obvious answer as to which of its 20 suppliers would be the best fit to shift to a Vested model. EY and CIRIO suggested Telia pilot the University of Tennessee's highly collaborative Request for Partner process to help them find a partner that not only was capable, but also a partner with an excellent cultural fit and a win-win mindset that would be essential to managing a longer-term supplier relationship in a dynamic environment.

In May 2016, Telia began what would be the Nordics' first use of the Request for Partner process. As part of the process Telia down-selected three suppliers to participate in a series of stakeholder workshops to solution how they could optimally work together to transform Telia's Tech Site operations.

A foundational concept of a Vested business model is that the buyer and supplier develop a contract for the future, not just to perform the work to meet today's needs. This means creating a flexible contracting framework that will help the parties navigate the dynamic nature of business changes and share risk/share reward on the journey. Through a series of collaboration workshops Telia and each potential partner developed a "statement of intent" for how they envisioned the strategic partnership working. One of those workshops was to co-create a shared vision and desired outcomes that would become the overarching beacon for the relationship. The following was the shared vision and desired outcomes of the Veolia workshop—one of the three down-selected potential partners.

"Together we proactively create optimal conditions for the future way of communicating. Our modern partnership creates common value and success through innovative and sustainable solutions."

As part of other workshops Telia fleshed out key concepts such as mutually defined desired outcomes, guiding principles for the partnership and potential innovations that the supplier can bring. Telia ultimately decided that Veolia was the best fit potential partner and went on to flesh out the remaining aspects of the partnership through a total of 17 collaborative workshops. The parties inked their deal in April 2017 under the virtual company name of OneTech and hit the ground running.

Evolving strategies

Sourcing strategies are evolving in response to changing business requirements. Traditional specification and price-focused approaches have been effective tools in enabling competitive pricing for tens—if not hundreds—of years. In recent years, organizations and software technology firms have invested millions of dollars perfecting the art and science of the highly competitive bid. We argue that you should challenge using some of the common "best practices" and instead introduce more collaborative approaches when selecting more strategic suppliers.

We hope this challenges your organization to think beyond the simple Request for Proposal for your next competitive bid.

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1 European Commission, Directorate General Internal Market and Services, Public Procurement Policy, "Explanatory Note—Competitive Dialogue—Classic Directive." Available at: http://ec.europa.eu/internal_market/publicprocurement/docs/explan-notes/classic-dir-dialogue_en.pdf

2 For a comprehensive discussion of Sourcing Business Model theory, see Keith, B.; Vitasek, K.; Manrodt, K.; Kling, J., Strategic Sourcing in the New Economy: Harnessing the Potential of Sourcing Business Models for Modern Procurement *(New York: Palgrave Macmillan, 2016).*

3 Before launching any RFx, an organization should do its homework by completing an assessment and analyzing its needs. The book Strategic jSourcing in the New Economy *outlines 20 key sourcing considerations organizations should make as they approach any sourcing initiative. A typical strategic sourcing initiative includes an "assess" phase where buyers seek to link requirements to business objectives. In addition, organizations perform various types of analysis (external market analysis, costs analysis, supply market analysis, benchmarking, etc.). Buyers also need to assess the level of risk associated with the sourcing initiative and determine how to balance value between the business and suppliers' organizations.*

Would you apply to your own job posting?

Too many job postings by procurement organizations get off on the wrong foot with inaccurate and even misleading information. Here are some tips on reducing common obstacles to finding the right people in a tight labor market.

BY VOJTĚCH KLÉZL AND JAN VAŠEK

Ever visit a job posting site and been less than inspired by what you read? Indeed, you have.

Some postings feel incomplete. Others read as if they were written from a script of interchangeable words with little meaning to a specific job or company. Still other postings leave you no better informed about the job or the company advertising it than you were before reading it.

We've all been there. Worse yet, some of us might even say the same about postings for jobs in our own company, or, even worse than that, our department.

It's actually shocking how poor so many postings are. Yet not a day goes by that someone doesn't remind us of the current difficulties in finding people for open positions. You would think that alone would be motivation to get the next posting right to reach suitable candidates.

While it's not working that way now, it can in the future.

We evaluated more than 400 job advertisements for procurement positions. We also contacted 256 procurement professionals about the skills they considered most important for various procurement jobs. Our conclusion: There's a huge mismatch between the postings and the expressed requirements of the procurement professionals.

It quickly became clear that job postings are often primarily used as a tool to inform potential candidates about a vacancy. We also realized other functions of postings are neglected altogether. These include introducing a company and its work culture to potential candidates. A summary of the job requirements is, believe it or not, often overlooked. So too are the benefits of the position and its rewards in hopes of

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motivating people to apply.

We'll start here with a review of those job postings and their weaknesses. Then we'll drill down to the neglected aspects that often don't make it into the job/company description at all. These include attributes such as expected expertise, competencies and even the personality traits expected of candidates. There's also the problem of the total disconnect between what the job really is and how the posting reads. We'll wrap up with some observations to help you work with human resources and other key departments to write a job posting that will get you more than your fair share of applicants.

The five types of postings

After reviewing those 400-plus postings, it was clear that each falls into one of five distinct groups or categories. Those five are:

1. routineer;
2. copywriter;
3. creative;
4. detailer; and
5. professional.

Each has its own characteristics, as detailed in Table 1. They range from a generic description that is not especially specific to ones full of excessive requirements. At either end of the spectrum, people wind up disappointed, and the job search (both the candidate's and the company's) flounders.

Perhaps the most surprising takeaway from this review is that not a single posting fulfilled the professional criteria in Table 1. The just as disappointing bookend is that the two least helpful categories, routineer and copywriter, accounted for 93% of postings. Clearly, job postings for procurement positions are in rough shape. It's even possible to make the case that the postings themselves contribute directly to the difficulty in finding qualified people for procurement jobs today.

By the way, this is a good point to mention that job searches involve two parties—those interested in being hired and those doing the hiring. Both have a vested interest of time and money in the process. It is an investment for everyone and should be treated as such.

We also discovered that the postings in each of the categories have certain common characteristics. And all too often, the shortcomings of the postings range from non-informational to overly detailed. Others range from a generic soup of buzz words to a description of expected competencies that no one on earth has ever fulfilled. Only those in the professional category sit in the sweet spot.

Consider this partial posting: "Sourcing specialist carries out its mission to deliver substantial, sustainable competitive advantage by putting the right people, processes and tools in place to make the best possible sourcing decisions in terms of quality, price, delivery, quantity and service."

Such a description fits into both the routineer and copywriter approaches. It is short on details and feels formulaic to the extent of being applicable to a whole range of procurement jobs rather than the single one being posted. Furthermore, such descriptions repeat the same clichés, misalign the requirements and confuse candidates who struggle to decipher whether they are suitable for the job, or if the job even suits them. For instance, what exactly are the "right people, processes and tools?" The posting provides no insights on any of the three. And all too often, the disconnect is made even worse when the posting ends with: "There's no such thing as a perfect candidate, so don't hold back." Well, that certainly clarifies everything, doesn't it?

Let's try another one. A routineer seeks a new "colleague with steel procurement experience … knowledge of purchasing processes and ERP ... 25% of time out of office." That sounds much more explicit than the first, and the company gets flooded with resumes. Unfortunately, the description isn't all that close to the reality desired. What the company really wants is a procurement expert in metallurgy. After several useless interviews, the purchasing manager sinks into depression.

The creative approach to this would be to reach out for "a procurement ninja ... whose life is about steel and willing to negotiate to death ... a high IQ, EQ, SQ ... permanently hunting for the best deal." Yet somehow, prospective candidates do not apply because they just do not identify themselves with the job posting.

Staying with that metallurgy expert, a detailer posting searches for a global commodity manager ... economics and metallurgy major ... extensive experience with steel products ... followed by a list of 12(!) specific, high-caliber procurement activities. When a highly qualified, motivated candidate shows up for an interview, it becomes clear the company actually needs an operational buyer and offers a mediocre salary with no growth prospects. Not exactly a match.

TABLE 1

Taxonomy of purchasing job advertisements

TYPE	FREQUENCY	ADVERTISEMENT ELABORATION PROCESS	RESULT
Routineer	51%	Pulls a proven template from the archives, adds a few buzzwords and general requirements.	A generic advertisement appealing to all, not clear what the company is looking for, a queue of unqualified candidates.
Copywriter	42%	Downloads 10 ads for the same position and creates the eleventh.	Informationally comparable to a poster "Hiring a buyer," a matter of luck whether a quality candidate turns up.
Creative	4%	Creates an appealing advertisement that literally catches the eye in the sea of grey.	Not clear what the company looks for, missing essential details, discourages "serious" quality applicants.
Detailer	3%	Carefully discusses the requirements with the client and creates a detailed and tailored advertisement.	Excessive demands, fabricated job description, a disproportionate skill/reward ratio, disappointed overqualified candidates.
Professional	0%	Drafts a quality advertisement for a position in purchasing-targeted, clear, and informative. The advertisement draws on HR and the Procurement department input.	The advertisement is informative and reaches out to suitable candidates.

Source: Authors

Preferred skills don't line up

From where we sit, it seems that purchasing job descriptions froze in the early '80s when purchasing was still viewed as a transactional and operational job. To show how disconnected postings have become from the actual jobs, we sub-divided the required skills and competencies into five categories:

1. technical skills;
2. interpersonal;
3. internal coordination;
4. external coordination; and
5. strategic business.

Then we compared the frequency of those skills and competencies in postings to the frequency of skills and competencies that the buyers (256 of them) said should be most often mentioned. And just as you suspect, the two didn't line up. In fact, they were somewhat inverted.

As Table 2 shows, technical skills were most frequently included in postings. Meanwhile, the procurement professionals we spoke with said technical skills should have been the fifth and final in importance for the purchasing job. We also found that so many postings overflow with trivial technical skills such as: perform mathematics functions, analysis, and writing skills; Microsoft Office with strong Microsoft Excel; conduct RFP and bid comparisons; commercial contract issues, negotiations and/or administration; and professional purchasing certification is a plus.

Meanwhile, missing are more advanced skills such as demand/supplier relationship management, sustainable SCM, innovation management and advanced statistics and data analysis. Similarly, basic interpersonal skills such as communication, teamwork and multiple languages are infrequently mentioned. More advanced skills such as—inspires, motivates and develops others or crafts win-win supplier relationships—are only rarely mentioned. Many other postings highlight the importance of advanced strategic business and external coordination skills but do not elaborate on them in the posting. Instead, the focus is on technical skills.

Importance of personality traits

The good news is that many companies now recognize the importance of candidate personality, and most postings do state desired personality traits. The bad news is that these are often mentioned only in passing and misaligned with the overall job description and hierarchical level.

We categorized the traits into what we call the "big five:"

1. conscientiousness;
2. openness to experience;
3. extroversion;
4. agreeableness; and
5. resistance to stress.

Conscientiousness was the most appreciated personality trait for both junior (71% of postings) and senior (51%)

TABLE 2

Buyer skills in job advertisements vs. buyer assessment

GROUP OF COMPETENCIES	THE MOST WIDELY QUOTED COMPETENCIES	ADVERTISEMENT FREQUENCY	BUYER ASSESSMENT
Professional	Basic knowledge of the purchasing process, product knowledge, computer and ERP literacy, category management, understanding of supply markets.	1	5
Interpersonal	Oral and written communication, conflict resolution, team leadership, sensitivity to cultural differences.	2	3
Internal coordination	Market analysis, stakeholder management, change management.	5	4
External coordination	Establish the appropriate supplier relationship, supply chain configuration.	4	2
Strategic business	Ability to see issues from a strategic perspective, value-added purchasing, strategic partnerships, risk management.	3	1

Source: Authors

positions. Desired attributes here include self-control, organization and reliability. However, such attributes are typical for simple and low-creativity positions, but are less adequate for positions that leverage initiative, innovation, cross-functional teams and communication with multiple stakeholders. There's a disconnect here, for sure.

Considering that the routineer and copywriter approaches represent 93% of all job postings, we may confidently argue that the personality traits in postings mindlessly pass from one generation to the next with little critical thinking. It happens without regard for the position's or company's actual needs. Just as disappointing, this stagnation runs counter to the evolving procurement role requiring openness to experience and extraversion for success in meeting future procurement challenges.

TABLE 3

Personality traits in job advertisements

BIG FIVE	MANIFESTATION	OCCURRENCE IN JUNIOR ADVERTISEMENTS	OCCURRENCE IN SENIOR ADVERTISEMENTS
Conscientiousness	Self-control, organization, reliability	71.4%	51.0%
Openness to experience	Curiosity, originality, creativity	24.3%	23.3%
Extroversion	Sociability, communicativeness, initiative	20.0%	17.2%
Agreeableness	Cooperation, warmth, trust	15.7%	20.5%
Resistance to stress	Calmness, self-control, emotional stability	10.0%	13.9%

Source: Authors

Toward a professional purchasing posting

Enough on what doesn't work. In fact, we could write several thousand more words on procurement postings that miss the mark. But the point has been made: An effective posting requires a thorough understanding of the position's responsibilities and what is needed for someone to be successful in that role.

So, let's shift the focus to professional postings that are well targeted, easy to understand and comprehensive. Following are some guidelines to writing professional postings most likely to lead to interviewing the right candidates right off the bat.

Now remember, in the 400-plus postings we reviewed, none fulfilled the professional category introduced in Table 1. What follows is our take on what is needed to draft a quality posting that is targeted, clear, informative and reaches out to potential candidates. It is also important to reiterate that getting there requires input from HR, purchasing and other relevant departments. Otherwise, the posting is written in a vacuum, but the person who takes the job will not operate in a vacuum of any sort.

As you can see in Table 4, we broke the process down to "what is needed in the posting" and "why." The eight "whats" are:

1. procurement-focused company introduction;
2. key challenge of the position;
3. degree of centralization and purchasing sophistication;
4. purchase categories and their complexities;
5. buyer seniority and expected expertise;
6. skills and competencies;
7. personality traits; and
8. rewards and benefits.

Denver has a versatile procurement portfolio of $200 million under management. The procurement director reports directly to the CFO."

The first paragraph must subliminally sell to the right candidate. Large purchasing organizations should imply high-calibre colleagues, sophisticated tools and processes, internal support, supplier motivation and innovation potential. On the other hand, smaller procurement departments should emphasize a more versatile portfolio under management, flexible procedures, empowerment or a flatter organizational structure.

TABLE 4

Professional purchasing job advertisement template

WHAT	WHY
Purchasing focused company introduction	Opportunity to "sell" the company and its purchasing organization.
Key challenge	Formulate an appealing job challenge.
Degree of centralization and purchasing sophistication	Describe the decision autonomy. Outline the critical procurement levers used.
Purchase category and its complexity	Provide relevant information about the purchase category.
Buyer seniority and expertise	Indicate the actual job complexity.
Skills and competencies	Filter out the unsuitable candidates.
Personality traits	Highlight what personality type will excel on the job/company.
Rewards and benefits	Save everyone's time and effort.

Source: Authors

The remainder of this article explains the "whys" for each of those eight.

Procurement-focused company introduction. From this starting point, the company is described and positioned through the lens of the purchasing department. It should, therefore, start with a brief, procurement-focused company introduction. It includes basic information about the company and its purchasing organization such as department size, annual spend and organizational structure. It might read like this: "A family-owned metal processing company with a small procurement team of four located in

Key challenge of the position. In a tight labor market with scarce talent, the posting is never just about filling a vacancy. It must convey an appealing and professional growth-relevant challenge. Generic job descriptions must, therefore, be avoided: "The sourcing specialist implements the corporate strategic sourcing and vendor management function and associated processes to ensure the company is supplied with the highest level of quality and in the most cost-effective manner." Instead, the posting should highlight a short, easy to understand and attractive challenge: Establish a purchasing category from scratch, apply the design-to-cost for all major investments, or form and manage a team of 10 procurement specialists.

Degree of centralization and purchasing sophistication. The third paragraph of the posting informs candidates about the job itself and answers their fundamental question: Do I want to work in this purchasing environment?

Unfortunately, most postings only provide a long shopping list of commonplace procurement activities that imparts little information of value to a knowledgeable candidate. One description with little value could read like this: "Monitor market trends and conditions to ensure that the contract portfolio is benchmarked appropriately." Instead, the section should enhance the introduction and inform candidates about the degree of purchasing centralization and decision autonomy. Here's an example: "The decentralized procurement structure encourages strategic buyers to define the category strategy and take the key decisions." Or it might read: "The local sourcing manager implements the global category strategy established at the central level."

Additionally, the degree of purchasing sophistication outlines the procurement maturity in terms of processes, tools, collaboration and critical procurement levers necessary to complete the job successfully. The description could read like this: "Our mostly informal processes, ad hoc communication channels and arms-length supplier relationships call for an operative/negotiation-focused buyer." Another example is: "Procurement department relies on robust processes, deep integration with other functions and intensive supplier involvement. Hence, advanced value engineering, total cost of ownership and category management skills are key to success." Yet another could be: "A a recognized SCM leader, our success depends on supply chain perspective, intensive supplier development and value-based purchasing."

Purchase categories and their complexities. Most postings provide only rudimentary purchase category descriptions, services or indirect spend. Yet, this does not help the candidates understand whether they are interested and qualified for the job.

Instead, the posting should characterize the purchase categories in some detail and position them on the purchasing matrix. Here's an example: "You will manage $40 million divided into non-critical services such as security, catering, cleaning and bottlenecks like audit, legal and consulting. The business currently manages the latter with little meaningful involvement from the procurement." If multiple categories are managed, this should be emphasized along with providing a list of the key categories. While this may deter some applicants, others may be strongly attracted to a versatile purchase portfolio under management.

Buyer seniority and expected expertise. It is important to focus on the candidate and describe the expected buyer seniority and expertise level. Unfortunately, assuming a link between seniority/expertise and the number of years in procurement/management function is misleading. Instead, describe the team under management because even "specialists without prior management knowledge" may be suitable for "leading an experienced group of senior commodity buyers" while "seasoned managers with a multinational company background" are needed for "restructuring the purchasing department of 20 buyers within the newly established centralized procurement structure."

As for the buyer expertise, provide a detailed description of what the ideal candidate does today. For example, a junior buyer "currently executes steel frame agreements and resolves supply related problems." Meanwhile, a senior buyer "manages the steel category strategy, negotiates contract terms" and the expert "develops strategic steel suppliers and applies the total value of ownership perspective to improve the specification and supply chain continuously."

Skills and competencies. The required buyer seniority and expertise determine the optimum mix of skills and competencies. These may be derived from an internal competency matrix, defined with the purchasing manager, or drawn from existing commercial frameworks. Avoid generic phrases like "strong organizational, communication and analytical skills." Instead, it is good practice to explicitly name the top three most relevant and differentiating skills, such as "proven track record of managing cross-functional design-to-cost teams," "familiar with procurement on commodity exchanges" or "basic understanding of environmental and social sustainability reporting."

If you care for formal procurement education and/or professional certificates, do mention them specifically. Finally, high-quality postings clearly distinguish between nice-to-have and need-to-know skills.

Personality traits. Considering the new purchasing roles such as procurement data scientist, innovation catalyst, procurement 4.0 or sustainability expert, more diverse buyer personalities will be required. Many companies may even hire for personality and train for skills. In the light of these challenges, the personality traits section must move beyond the generic, one-size-fits-all clichés and reflect the company culture and the challenges ahead.

Unlike previous sections full of procurement-specific terminology, the personality traits section must be formulated in a layman's language. Instead, simple descriptions are preferred for openness to experience, such as "you are creative, embrace change, try new things, naturally inquisitive, and seek new knowledge."

Rewards and benefits. The last paragraph should outline the rewards and benefits. The decision to disclose a salary range is entirely at the company's discretion. However, keep in mind that buyers are pragmatic people and know their value. Our interviews suggest that salary transparency saves many misunderstandings, especially for highly qualified purchasing positions. Interestingly, practitioners are particularly sceptical of "we offer a competitive salary package." And even if you offer below-market conditions, you may still be attractive to high-calibre applicants who look for a better work-life balance or have just moved into your area.

We believe that a professional job posting also positions a company to prospective candidates. The recommended structure of a posting requires thorough preparation and intensive coordination between HR and the purchasing director.

As those 265 procurement mangers made clear, taking extra effort up front to make the posting informative and motivational will be rewarded with more relevant candidates and less time spent in hopeless interviews.

Acts of God and other *force majeure* events

Five ways to mitigate uncontrollable SCM risks.

BY MARK TROWBRIDGE

If there's one word that characterizes the past two years, it is instability. Companies across the globe accustomed to predictable, stable and sustainable supply chains have been grappling with risks and disruptions that are outside the control of their organizations. It's no surprise then that operational sustainability has emerged as a major theme for supply chain leaders, one that now incorporates supply chain stability. Afterall, innovative companies are finding ways to return to the pre-pandemic period of relative predictability. This heightened focus on identifying potential disruptors in advance of a disruption has naturally begun to encompass the portion of the supply chain that occurs outside of the enterprise itself—upstream and downstream supply chains.

Upstream includes the suppliers that create goods and services used in a company's operations; whether as components, raw materials or ingredients that flow into "direct" manufacturing as raw materials, or the indirect products and services which facilitate the company's actual operations. The downstream supply chain includes the partners and suppliers an organization relies on to efficiently distribute and deliver its own products or services to its customers. Whether upstream or downstream, contracted suppliers need to be proactively managed to minimize financial, confidentiality, operational, reputational and legal risks.

One of the most challenging categories of risk management has been, and continues to be, exposure to *force majeure* events, including events referred to as Acts of God. This article will discuss:

- the history of the term *force majeure*;
- what a *force majeure* event is;
- a typical *force majeure* contract clause (who it protects and the potential protections and exposures); and
- five key ways to protect your supply chain from *force majeure* risks.

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Force majeure

The term *force majeure* may sound Latin, but it's actually French. Translated correctly, it means overwhelming force.

The concept of *force majeure* originated in French civil law and is an accepted standard underlying many jurisdictions that derive their legal systems from the Napoleonic Code. The use of *force majeure* language accelerated around the globe due to World War II, when France, like many European nations, was overrun by the German army. The Germans shut down French businesses and converted many factories into the production of munitions.

After the war ended, companies whose owners had survived the war returned to their normal business operations. But the story did not end happily. Lawsuits were filed, whereby prior customers of the French companies sued them for breach of contract due to their failure to deliver product volumes during the military occupation of France. Some of the manufacturers had *force majeure* protections in their contracts; those without such protections were required to pay substantial damages. In some cases, owners without protections lost in court what a world war had failed to take away.

An Act of God

A *force majeure* event has classically been associated with an Act of God; that is an event for which no party can be held accountable. Acts of God might include natural disasters like Hurricanes Katrina or Sandy, earthquakes or flooding like that which hit Japan in 2011. But the definition also includes human actions beyond the reasonable control of a contractual party, such as war, changes to governmental policy and industry shortages. A *force majeure* event might also be one that is out of character for a region, such as the winter freeze in Texas in 2020. This event was so out of the ordinary in that state that many *force majeure* protective contract clauses kicked in for affected suppliers. Unlike in France, where *force majeure* is often an assumed protection in contracts, in other common law systems like those of the United States and the UK *force majeure* clauses are acceptable, but must be more explicit about the events that would trigger the clause.

There are exceptions. The general concept of *force majeure* does not apply when there is a reasonable probability of occurrence. So, if a manufacturer chooses to outsource production to a location in a politically unstable region, they may not be able to claim *force majeure* protections due to production failure.

Who does *force majeure* really protect?

In the field of procurement contracting, it is important to realize that a *force majeure* clause usually exists for the protection of the supplier and not the buyer. Aggressive suppliers desire this protection, and often push to carve out overly-broad aspects of relief.

But smart buying organizations can also strategically insert protections into the *force majeure* language to provide options in the event of an occurrence. Most important is that a buying company is not locked into exclusivity commitments without recourse regarding a non-performing supplier.

Indeed, some suppliers have overly broad *force majeure* protections. Early in my career, I recall the boilerplate contract language of a leading provider of copiers being excluded from performance as the result of "proximate detonation of a nuclear device." Upon reading that, I recall thinking: "If a nuclear bomb goes off, the last thing I'm going to worry about is whether my staff can make copies."

But, smart buyers can insist on *force majeure* language that protects their interests. More about that below. A typical *force majeure* clause might look like the example on the following page. Note that this example lists "military action or inaction" as force majeure causes. This goes back to the second world war. To this day, historians are still divided as to whether the fall of France was most attributable to German strength or French indecision. Hauntingly similar, as I'm writing this article, the Ukrainian Parliament has just voted to grant their citizens the right to carry firearms—the same day that the Russian army had already begun to invade the country. Would future force majeure claims be better attributed to military "action" or "inaction?" Time will tell. So, we see both addressed in typical *force majeure* language. But that's another story.

Our clause example contains several important elements. First, it defines a *force majeure* event. This is critical because otherwise, too many excuses could be granted to a supplier for non-performance. Second, it establishes a notice process and protected timeline for non-performance by the party claiming the *force majeure* protection. Third, it establishes the right of the other party to terminate all or part of an affected contract if the allowed *force majeure* period exceeds a particular duration. Fourth, it permits the other party to source similar goods during the affected period, without penalty.

Without this formula, too often *force majeure* contract language becomes a security blanket protecting only the supplier. So, as buyers we need to carefully consider what *force majeure* language does and does not contain.

Five key techniques to protect your supply chain

Let us next explore five techniques to prepare for and navigate through *force majeure* challenges.

Force majeure

A. *No liability shall result to either party from delay in performance or from nonperformance caused by circumstances beyond the control of the party who has delayed performance or not performed (each, a* force majeure*). Such circumstances may include, but are not limited to, hurricane, flood, earthquake or other act of God, military action or inaction, or requirement of governmental authority, strike or lockout. The non-performing party shall be diligent in attempting to remove any such cause and shall promptly notify the other party of its extent and probable duration and shall give the other party such evidence as it reasonably can of such* force majeure.

B. *If the non-performing party who has delayed performance or not performed on account of circumstances beyond its control is unable to remove the cause within 30 days of the commencement of such delay or nonperformance, the other party shall have the right to terminate the entire Agreement or any portion of it, without penalty, immediately upon written notice thereof to the non-performing party.*

C. *Notwithstanding the foregoing, throughout any* force majeure *delay the other party shall have all rights to acquire similar product (or services) from an alternative provider.*

Source: Strategic ContractingTM, Strategic Procurement Solutions, 1999–2022

Technique #1: Plan for the worst. Over several decades, experts in enterprise risk management and sustainability have realized that there are several important factors that must be considered in planning for *force majeure* events.

One factor is to consider the likelihood that a particular type of event may occur. If you have a supplier plant located in California, it's wise to have a contingency plan oriented around the occurrence of an earthquake. Similarly, if your plant is near the Gulf Coast, it's prudent to be prepared for a hurricane. These types of *force majeure* events have a probability that can be forecasted to some degree.

A "black swan" event is one that cannot be statistically anticipated. Many did not consider that an event such as COVID-19 could occur—until it did. The world's best insurance actuarial could not have forecasted 9/11. So, being prepared for "black swan" events means that a diversified strategy for dramatic change must always be in place.

Another preparation factor is to design a game plan to offset the occurrence of such an event. Consider just a few of the events we experienced in 2021 and 2022.

- Container shipments were constrained by labor issues in California ports.
- There were dramatic increases in the cost of transportation.
- Global availability of paint and resins was decimated by a winter freeze in Texas.
- War broke out in Eastern Europe.
- U.S. companies are nearshoring production to Mexico and North America due to constrained trade with China.
- Maritime passage through the Suez Canal was stopped by a grounded container ship.
- 40,000 Canadian truck drivers participated in weeks of protests.

Technique #2: Create supply chain optimization and redundancy. The most important technique to successfully transition a range of *force majeure* events is to design and deploy a robust supply chain. It is essential to diversify the location and capacity of your portfolio of key suppliers. There must be multiple qualified sources of supply for each important product or service needed by your operations.

For strategic sourcing diehards like me, this mean that as part of initial strategic sourcing and supplier selection, enterprise risk management (ERM) principles should be deployed to avoid over-consolidation of the supplier community. Too often, aggressive sourcing groups (and their consultants) choose to award a sole contract to a single source contractor. That works fine until a disaster occurs, such as financial failure of the supplier or a plant shutdown.

Proper strategic sourcing must select a balanced supplier portfolio to either (i) provide multiple plant or data center redundancy under the same provider (such as the ability to manufacture or perform services in multiple locations); or (ii) segment the provider relationship across multiple suppliers in a tiered primary and secondary contractual manner. Important note: Merely having a list of pre-qualified suppliers doesn't accomplish your objective, as it can dupe you into falsely believing you can turn to any of the alternatives during a time of need to fulfill your requirements. That mindset can lead to failure during a true *force majeure* event, as providers will always prioritize their most-loyal customers. They are not going to jump through hoops to support a low-volume customer that gives most of the business to their competitor during easy times.

Diversifying your supply chain will ensure that you can sustain supply chain operations even in the event of a failure in one production location.

Technique #3: Have the right force majeure contract language. It is very important for buying organizations to insist on *force majeure* language that protects them as much as it protects the supplier during disruptive events. The clause example earlier in this article might be a starting point to review with your legal counsel.

Key things your language should provide are as follows.

- Carefully define what really qualifies as a *force majeure* event. For example, when our firm was tailoring a course on strategic contracting for a large Gulf Coast energy utility client, a colleague reviewing their procurement group's template agreements noticed something odd. The utilities' own template contracts for emergency "right of way" vegetation clearance services along power line corridors during storm occurrences contained a generic *force majeure* clause that allowed non-performance "during times of inclement weather." Their own language eliminated performance during the time when services were needed most. Our discovery of this conflict immediately resulted in 150+ contract amendments being executed with a large group of contractors to change the *force majeure* clause. Those amendments were completed just before the arrival of Hurricane Katrina.
- Don't let the supplier off the hook for loss of profitability. Some suppliers want to be protected from any marketplace price changes which lessen their profits. They don't want to bear additional costs like air freight to fulfill their customer obligations. You may be forced to accept some protections for the supplier, but a helpful principle is to protect the supplier from financial loss, but not from reduced margins (or break-even performance) during the *force majeure* event.
- Preserve your rights not to be affected by the supplier's non-performance. Open the door for your company to have other options.

Having protective language in each agreement is a huge advantage for a buying company when the world turns upside-down. But rarely can we retroactively amend contracts after a *force majeure* event occurs in order to gain protections. The time to address this is now.

Apple's approach is a good example. Its contract language is rumored to include a concept called, "first right of resumption." According to sources familiar with Apple, this concept gave Apple superior rights during the devastating 2011 Tōhoku earthquake and tsunami that decimated Japanese manufacturing for months. Sources say that Apple's protective language required many of the affected suppliers to prioritize fulfillment of Apple's backorders before working on any other customer's output.

Technique #4: Build the ability to monitor and manage every supplier.

In a 2021 study, CAPS Research characterized the maturity of companies' supplier risk management programs in the following chart. Note that in Figure 1, immature programs (on the left) tend to have limited visibility to visibility into the supply chain, while mature programs (on the right) have increasing visibility and management alignment to a buying organization's entire portfolio of supplier risk.

When I discussed this chart with Denis Wolowiecki, executive director of CAPS Research, he said: "It is critical for less mature supply organizations to move beyond reactionary responses following the impact of a supply disruption. Top performing companies differentiate themselves by proactively identifying and managing risk in their supply chains."

The question then is: "How can visibility, and resultant stability, be created across my portfolio of several thousand suppliers?" The good news is that this no longer requires excessive staff build-ups or costly subscriptions to external providers of supplier risk data. Dramatic change is coming to the supplier risk space similar to the entrance of Amazon, Uber or DoorDash in their respective industries. Interestingly, one of the largest and fastest-growing supplier risk management companies neither advertises nor participates in technology solution reviews*. At no cost to a corporate customer, this provider performs the following types of risk management services for every supplier:

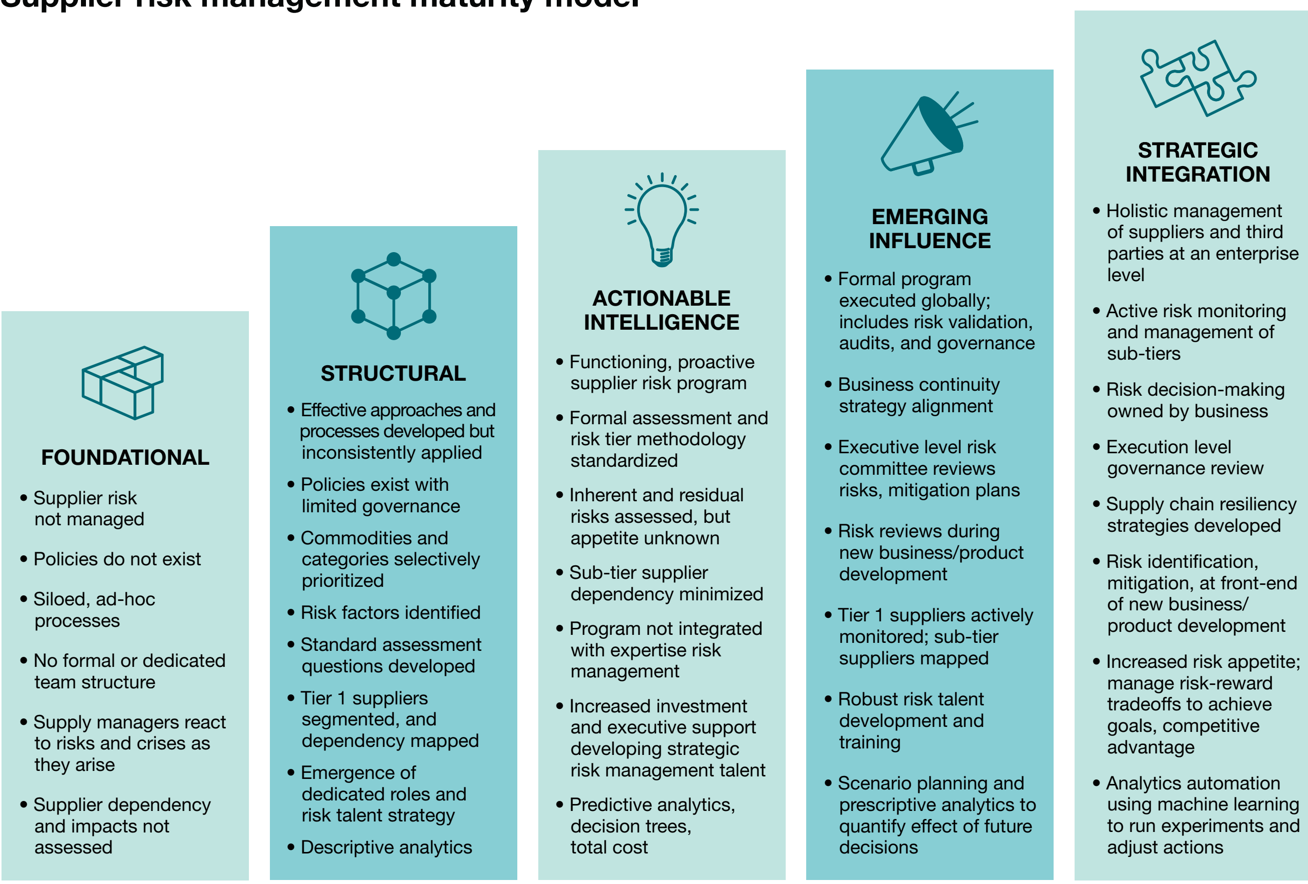
- verification of supplier taxpayer registration;
- predictive financial stability tracking (active monitoring and notification);
- digital validation of supplier insurance policy coverage(s);
- checking of supplier against 1,500 governmental watchlists (terrorism, rare earth minerals, environmental, restricted country/provinces, labor law violations, child labor practices, slave labor, human trafficking, etc.);
- cybersecurity review of supplier website exposure;
- monitoring of legal judgements and liens against each supplier; and
- monitoring of 30,000 global media sources for negative news accounts about the supplier (often *force majeure* related).

Technique #5: Proactively manage key supplier relationships. Once you have a foundation that provides insight and monitoring of every supplier's risk exposure, a proven method of risk avoidance is to Pareto all supplier portfolio companies into categories based on financial spend or assigned risk using techniques. For example:

- Class A suppliers (the 15% of suppliers representing 75% of total spend);
- Class B suppliers (the 25% of suppliers representing 15% of total spend); and
- Class C suppliers (the 60% of suppliers representing 10% of total spend).

FIGURE 1

Supplier risk management maturity model



Source: Supplier Risk Management Maturity Model, CAPS Research & Arizona State University, 2021

Using these types of categorizations, strategy coaching and feedback can be developed. This should address strategic preparations to manage through *force majeure* events but can also dovetail nicely with overall supplier performance. Often Class A and some Class B providers are met within a parent/teacher/student coaching model to identify improvement opportunities and corrective actions for deficient performance. Class C suppliers are rated and moved up or out based on their ability to meet objective objectives regarding risk preparation and performance. Using data from your supplier risk solution* and ERP or MRP technology tool, also consider tracking all suppliers' performance and risk exposure and notifying the supplier of needed improvement.

By now, it should be clear that it's imperative to proactively manage supplier risk. This is especially true with regards to *force majeure* events. Using these five techniques can prepare any organization to navigate through *force majeure* events as well as disruptive occurrences that seem to be part of the new normal.

Astronaut Jim Lovell once said: "There are people who make things happen, there are people who watch things happen and there are people who wonder what happened." The same is true regarding *force majeure* supply chain events if we're not prepared.

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**Contact author for identity of supplier risk provider.*

Buy now, pay later: Is it a supply chain thing?

Buy now/pay later is one of the hottest trends in marketing, creating new sales for organizations. It's also creating headaches for supply chain professionals from procurement to operations.

BY TAN MILLER

Let's say that you're the manager of logistics for a major retailer. Led by the sales and marketing groups, your firm has recently implemented the latest rage in e-commerce and retail purchasing practices, "buy now, pay later," or what we'll call BNPL. The program allows consumers to make a purchase and receive the merchandise today while making payments over time. Of course, these programs have been around for years. Backed by finance companies, they've typically been offered by companies and services providers with expensive products that people used to spend years saving up for, everyone from your local dentist to finance expensive dental procedures like crowns and veneers to furniture retailers. Today, these programs have gone mainstream: Use your Paypal account to buy a $60 pair of shoes online, and Paypal is likely to give you the option of paying for the purchase over four payments to six payments.

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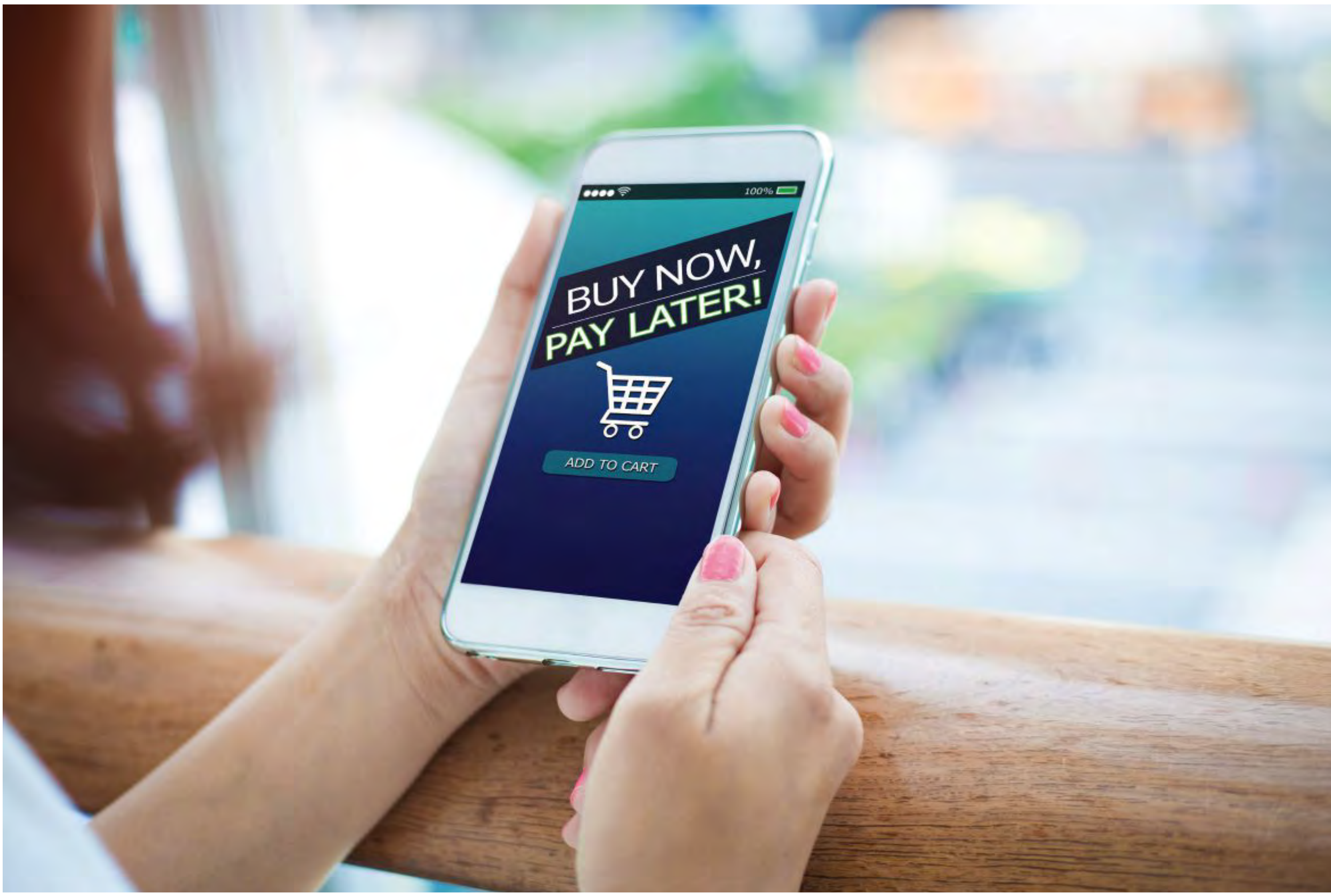

BUY NOW,
PAY LATER!
ADD TO CART
100%

It's easy to see why sales, marketing and finance might love these programs because they potentially open up a new sales channel and increase revenue. But what about supply chain? Perhaps it's not as simple as it seems on the surface and creates a new set of logistics costs and headaches.

Over the years, you, the supply chain manager, have made the accommodations necessary to facilitate a lay-a-way purchase. When a customer purchases via lay-a-way, you put the item aside in your warehouse or the back room of a store, and then ship the item to the customer, or they pick it up in the store, after the final payment is made. You have to create additional storage space and perhaps a carry cost to hang on to the item. But, if they customer fails to make the final payment, the item can still be resold as new.

The BNPL is similar, but different. Now, when the customer clicks the purchase option after agreeing to make payments, they take immediate possession of the item, either picking it up in a store, or after you ship it out to them. That sounds simple enough. But, one of the things you noticed is that not infrequently, the customer changes their mind, cancels the BNPL contract, and returns the item to your distribution network, just like they'd return any other product. Sometimes, the returns don't come back for weeks, or even months, after they've been used by the customer for some period of time in their homes. What's more, as the volume of e-commerce orders has picked up, so has the volume of returns, including those purchased using BNPL.

These returns come back in various used states. In some cases, the products can no longer be sold again, even on a discounted, used basis. As a logistics manager, you find yourself wondering whether the BNPL purchase option is actually helping or hurting your firm's financial success, if you take into consideration all of the costs associated with handling, returning and potentially disposing of the product.

As the use of BNPL escalates rapidly, logistics professionals may rightly be concerned as to the potential ramifications of their firm's adoption of BNPL on logistics operating costs, and ultimately on their firm's profitability. Further, as the pandemic has intensified the attention paid to the critical impact of the supply chain on the daily lives of consumers, logistics and supply chain is playing an elevated role at your firm. You and your supply chain team leaders now report directly to the COO or CEO. In that role, you have to decide whether now is the time to insert supply chain and logistics considerations into your firm's debate over the merits of BNPL, along with your colleagues from sales, marketing and finance. And specifically, you intend to influence your firm to adopt well-known logistics principles such as "total cost of ownership" into the BNPL decision-making process.

That's a big step. To make it, you want to be armed with facts about the true cost associated with the BNPL option to your firm. In this paper, we present a small, straightforward model to quantify the benefits and costs of BNPL. We envision this BNPL model as a tool that logistics managers can utilize both for their own analysis of BNPL, and importantly as a vehicle to facilitate discussions with colleagues in sales, marketing and other departments in their firm.

Specifically, this model integrates logistics costs into the overall analysis of how BNPL affects a firm financially. It provides a straightforward, easy-to-implement tool to evaluate the impact of BNPL with logistics-related costs taken into consideration. Finally, we note that while the model described here is intentionally simple, it can readily be expanded to incorporate additional logistics factors, as well as more advanced analytical methods such as the utilization of probability analysis in sales forecasts. (Readers interested in using a more advanced version of this model can contact the author directly.)

What is buy now, pay later?

BNPL plans were pioneered in the early 2000s by start-up firms such as Klarna, Affirm and Afterpay. Payment period durations can range from weeks to months to even years, depending upon the type of product and the terms offered by the merchant. Additionally, other financial terms for the consumer such as the interest rates, penalty fees, missed payment rules and so on can vary widely. For example, many BNPL purchase options have no interest fees, while others may impose substantial fees.

Without question, BNPL is big business. As BNPL has gained an increasingly strong foothold in recent years among retailers, and in particular their younger consumers, heavyweight financial firms such as American Express, Paypal and others have joined the ranks of BNPL providers. This promises to accelerate the growth of the BNPL market, which CNBC estimates has already reached about $100 billion in 2021.

The *Wall Street Journal* puts the number even higher, which earlier this year reported that investment firms like Brigade Capital Management made double-digit returns in 2021 funding “more than $500 million of ‘buy now, pay later’ consumer loans.” According to the *WSJ*, such direct-to-consumer loans amount to more than $1 trillion loaned each year by private capital. Whichever number is correct, it’s obviously large, and growing quickly as the investment community looks for higher returns in an otherwise low interest environment.

As previously noted, BNPL differs from traditional layaway programs because the consumer acquires the product immediately, before paying in full for the product, compared to layaway, where the consumer receives the product only after the completion of all payments. Further, third-party financial providers typically charge merchants a BNPL service fee of 5% to 6% rather than the typical 2% to 3% fees assessed for traditional credit card services. This all adds up to BNPL representing both a potential sales (revenue) enhancement opportunity for retailers, but also a potential source of additional costs and risks, including logistics-related costs. Thus, it creates the need to evaluate the potential impact of BNPL on a firm from all financial and operational aspects, including logistics related costs.

BNPL, simplified

Table 1 displays a simple Excel-based cost-benefit model that evaluates the changes in both revenues and costs for a firm before and after it offers the BNPL purchase option to its customers. A firm that has already implemented BNPL will have before and after data, while a firm that has not yet offered BNPL to its customers must develop forecasts. We will discuss later why firms in either situation may benefit from employing alternative forecasts of revenues and costs under BNPL.

A quick review of Table 1 illuminates the simple premise of this model; namely, we compare sales revenues and logistics related costs pre and post BNPL. This facilitates calculating the incremental changes in revenues and logistics costs, as well as the incremental change in total profit contribution (CTPC) after logistics

TABLE 1

A simple "buy now, pay later" cost-benefit model

Annual revenue or cost component [1]	Projected total revenue or cost $ (000): With BNPL option	Projected total revenue or cost $ (000): Without BNPL option	Incremental change from offering BNPL $ (000)
Sales revenue [2]	$11,000	$10,000	$1,000
Sales revenue of returns that are salvaged and resold	$660	$450	$210
Revenue from cancellation fee charge on returns	$2		$2
TOTAL REVENUE	$11,662	$10,450	$1,212
Lost revenue from returns	$1,100	$500	$600
Service fee to 3rd party financial firm [3]	$660	$200	$460
Increase or decrease in inventory carrying costs	$2		$2
Logistics handling costs of returns	$11	$5	$6
TOTAL COSTS	$1,773	$705	$1,068
Change in total profit contribution after logistics and sales related costs of offering BNPL	$9,889	$9,745	$144

[1] The costs shown are only those logistics and service fee costs directly associated with BNPL which may vary depending upon whether BNPL is or is not offered to customers (i.e., these are not "total logistics costs" so costs such as transportation costs are not included)

[2] This represents total sales revenue (i.e., it is not just sales purchased with the BNPL financial option)

[3] It is assumed the 3rd party firms are BNPL financial providers, or in the case of "without BNPL", the third party financial providers are credit card firms

Source: Authors

and related costs from offering BNPL.

CTPC is defined as the difference between total revenues—total logistics related costs, both after and before a firm makes BNPL available to its customers.[1] For example, the fictitious illustration in Table 1 indicates that under the scenario modeled, the firm's CTPC would increase by $144,000 annually by offering BNPL. This gain in CTPC would result because total revenues with BNPL offered rise by $1,212,000, while total logistics related costs increase by $1,068,000. The difference of $144,000 between the incremental changes in revenue and logistics related costs represents the annual incremental change in CTPC that BNPL generates for the firm.

The results of the analysis displayed in Table 1 obviously depend on the actual or assumed data underlying this model. In many cases, firms will not have before and after BNPL data, and will need to make forecast assumptions, such as firms that either have not yet implemented BNPL or have just recently begun to offer this financial option. However, even firms that have actual BNPL experience and data may benefit from exploring different what-if future scenarios. Tables 2 and 3 review the data assumptions underlying the analysis shown in Table 1, and set the stage for the what-if simulation we will illustrate in Table 4.

Table 2 reveals the revenue and sales related variables evaluated by the BNPL model. A glance at the first column shows that before and after sales revenue, lost revenue, salvage revenue, cancellation fees revenue and fees for financial services (costs) are included in this version of our model.[2]

Columns 3 and 2 display the before and after values for each of the variables. Columns 4 and 5 allow the model user to enter either actual data or alternatively to make assumptions (projections) on the impact of implementing BNPL on a model variable. Thus, the data points entered in columns 4 and 5 affect the values shown in column 2.

For example, in the scenario displayed here, the projected or actual increase in sales resulting from the implementation of BNPL is 10%. This scenario also assumes that the firm charges a cancellation fee to customers who don't make their BNPL payments (e.g., $100), and it projects the average number of cancellation fees enforced per year (e.g., 20).

We can observe all of the variables considered in this scenario, and can also envision how any other variables pertinent to a particular firm could be incorporated into the analysis to customize this model.

TABLE 2

Revenue actuals and forecasts and sales related fees

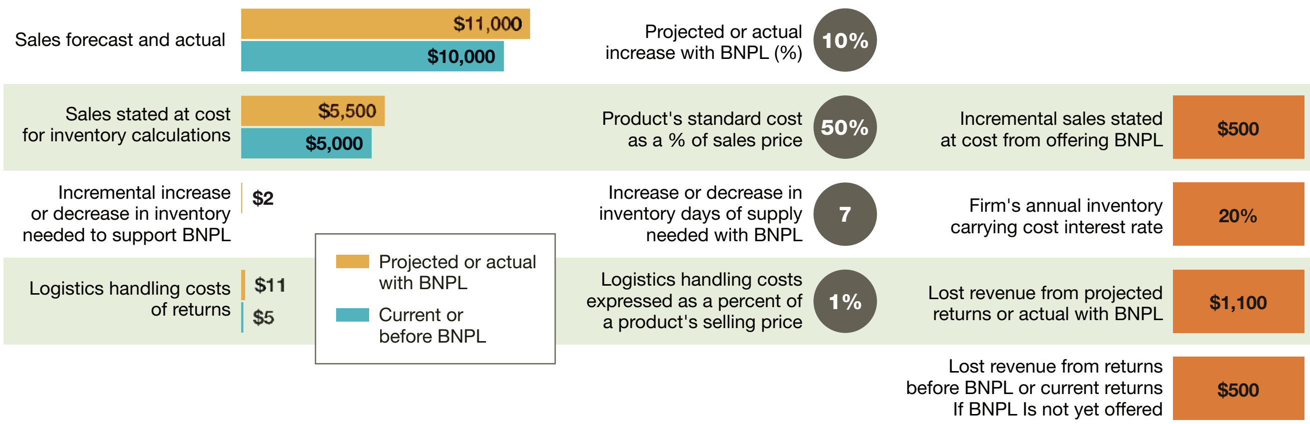
	Projected or actual with BNPL	Current or before BNPL				
Sales forecast and actual	$11,000	$10,000	Projected or actual increase with BNPL (%)	10%		
Lost revenue from returns	$1,100	$500	% returned with BNPL	10%	% returned without BNPL	5%
Sales revenue from returns that are salvaged and resold	$660	$450	% of full price that returns are sold at with BNPL	60%	% of full price that returns are sold at without BNPL	90%
Revenue from cancellation fee charge on BNPL[1]	$2		Average cancellation fee charge on customers who don't meet BNPL payment schedule	$100	Average number of cancellation fees assessed per year to BNPL customers	20
Service fee paid to 3rd party financial provider	$660	$200	% paid to BNPL 3rd party financial firm	6%	% paid to credit card 3rd party financial firm	2%

[1] For firms that charge a cancellation fee on product purchased via BNPL and which is either returned, and/or the customer does not meet the payment schedule and the product is re-possessed by the firm - this row captures the revenue obtained from the cancellation charges

Source: Authors

TABLE 3

Logistics costs and variables



Source: Authors

Table 3 focuses on the logistics related costs and variables potentially affected by the implementation of BNPL. For clarity, sales before and after BNPL are restated from Table 2, and then are calculated at cost to facilitate inventory calculations. Next, the model evaluates the incremental change in inventory required to support BNPL. To facilitate this calculation, the user must input the change in inventory days of supply required with BNPL and the firm's annual inventory carrying cost interest rate.

Finally, the model considers the logistics costs of handling returns before and after BNPL. For this calculation, the user must provide the firm's handling costs expressed as a percent of the product's selling price, and lost revenue before and after BNPL is also utilized.[3]

A breakeven modeling illustration

Table 4 posits an illustration of how we envision a manager employing this model to evaluate and facilitate a discussion of the potential impact of BNPL on a firm's profitability. For a firm either considering a BNPL implementation, or in the early stages of an actual implementation, developing the after results (i.e., the after data) may not be clear or settled yet.

In any of these situations, sensitivity or what-if analysis represents a powerful tool to provide perspective on an uncertain, difficult to forecast outcome. Specifically, by utilizing sensitivity analysis, managers can obtain an order of magnitude, directional view on the potential impact of BNPL. Table 4 presents a what-if sensitivity analysis that illustrates the insights this tool generates. Now, let's briefly review the example in Table 4 and discuss its analytic value.

Table 4 displays the results of seven illustrative scenarios where the assumed or forecast increase in sales resulting from the implementation of BNPL ranges from 0% to 30%. Column 3 shows that depending upon the increase in sales generated by offering BNPL, our fictional firm could lose as much as $753 thousand in profit (if sales remain unchanged) or gain as much as $1.9 million in profit (if sales increase by 30%). Further, this table reveals that the breakeven point where incremental sales from BNPL begin to generate a positive contribution to profit lies somewhere between 5% and 10%.

The value of this analysis lies not in a specific projection of where the profit contribution turns positive, it is just over 8% according to the results in Table 4[4]; but rather in the general range it suggests. In this case, from Table 4, we observe that if BNPL stimulates sales increases of about 15% or more, we can be confident that the overall impact on profits will be positive, while if sales increase by much below 10%, BNPL may have only a marginally positive—or even negative—effect on profitability.

This range and perspective enhances a firm's decision-making process by enabling managers to more confidentially asses the potential or actual value of BNPL for their operation. For example, while managers may have great uncertainty regarding a specific sales forecast increase, they may have a much higher degree of confidence that BNPL will generate increased sales of more than X% or less than Y%. Sensitivity analysis, as illustrated in Table 4, can often provide sufficient order of magnitude guidance to allow managers to reach a conclusion or make a decision confidentially.

The bottom half of Table 4 lists the other assumptions (forecasts) made to generate this analysis. This offers a concise view of all the variables and projections underlying the what-if sensitivity results. This perspective is important as the values assumed for some of these variables, such as the percent of purchases returned under the BNPL option, may represent best guesses. At the same time, other variables such as logistics costs expressed as a percent of a product's selling price may be known data points. By reviewing all of these variables, along with the alternative sales increase projections under BNPL, a manager can more confidently assess the results.

Extensions to Table 4 and the model

The analytic results and model displayed in Table 4 can easily be expanded and customized for an individual firm. Briefly, the following highlights a few of the extensions users can implement.

TABLE 4

Buy now, pay later: What-if sensitivity analysis

Scenario #	Projected increase in sales with BNPL (%)	Change in total profit contribution after logistics and sales related costs of offering BNPL: [rev - logistics related costs] $ (000) annual	Total sales revenue $ (000) annual: With BNPL option	Total sales revenue $ (000) annual: Without BNPL option	Total logistics and other BNPL sales related costs and fees $ (000) annual: With BNPL option	Total logistics and other BNPL sales related costs and fees $ (000) annual: Without BNPL option
1	0%	-$753	$10,000	$10,000	$8,992	$9,745
2	5%	-$304	$10,500	$10,000	$9,441	$9,745
3	10%	$144	$11,000	$10,000	$9,889	$9,745
4	15%	$593	$11,500	$10,000	$10,338	$9,745
5	20%	$1,041	$12,000	$10,000	$10,786	$9,745
6	25%	$1,490	$12,500	$10,000	$11,235	$9,745
7	30%	$1,938	$13,000	$10,000	$11,683	$9,745

With BNPL option   Without BNPL option

Other scenario assumptions in addition to the assumed increase in sales resulting from offering BNPL

	With BNPL option	Without BNPL option
Percent of purchases returned	10%	5%
Percent of full price that returns are re-sold at	60%	90%
Percent paid to BNPL 3rd party and to credit card 3rd party provider	6%	2%
Logistics handling costs expressed as a percent of a product's selling price	1%	1%
Product's standard cost as a % of sales price	50%	50%
Firm's annual inventory carrying cost interest rate	20%	20%
Cancellation fee on customers who don't meet BNPL payment schedule	$100	NA
Average number of cancellations fees asessed per year to BNPL customers	20	NA
Increase or decrease in inventory days of supply needed with BNPL	7	NA

Source: Authors

1. A range of what-if scenario values for any variable (e.g., percent of purchases returned under BNPL) can be evaluated. Table 4 only illustrates a what-if on the percent increase in sales with BNPL, and holds constant all other variables' assumed values. However, this what-if can be done for any other variable also.

2. One can define a larger set of scenarios where alternative values for two or more variables are utilized, such as the projected increase in sales and the percent of purchases returned. Obviously, the number of combinations and scenarios would increase, but one can feasibly do this.

3. User friendly software such as Microsoft Access, Python or even Excel Macros can be employed to create automated versions of this model. For example, a program can be constructed where the user simply inputs before and after BNPL data for each variable, and then the program automatically runs each scenario and generates an output report similar to Table 4.

Modeling considerations

The example presented in Table 4 represents just one concise illustration of the customized BNPL models a firm can create to evaluate the potential benefits and costs of implementing BNPL, taking logistics related implementation factors into consideration.

Obviously numerous other business, marketing and sales considerations weigh heavily in an evaluation of BNPL, and may even hold a higher priority and influence on any decisions. Nevertheless, this model can assure that logistics factors receive appropriate consideration in a firm's assessment of BNPL, and that decisions on BNPL are guided by the "true total costs" of this financial payment option.

To conclude, we offer the following bullet list of factors to consider when analyzing BNPL. Some apply more specifically to logistics related modeling factors, while others would more generally apply to a BNPL implementation strategy.

1. A firm that offers consumers hundreds or thousands of products may find it neither feasible nor insightful to explicitly analyze the potential BNPL costs and benefits for each individual product. Alternatively, a strategy of evaluating families or groups (e.g., brands) of products represents an efficient analytic approach.[5]

2. Further, certain general product categories may represent good candidates for BNPL, while others may not. For example, retailers such as Walmart, Target, Home Depot, Lowes and others offer an extensive variety of products to consumers, and their prices range from under five dollars to hundreds and thousands of dollars. Clearly below some dollar threshold, a BNPL purchase option does not make sense. Similarly, while BNPL may work for consumer durable products, it generally does not for consumer perishable items.

3. Firms such as retailers utilizing an omni-channel sales and logistics strategy may have to do their analyses by location, or at least by categories of locations. Large retailers often provide their customers many different ways to buy products including:

- purchase from a store location and check out;
- purchase online from a store location and drive to a pickup location outside of the four walls of the store itself (e.g., drive-thru);
- purchase online and receive home delivery from a store location;
- purchase online and receive home delivery from a distribution facility; and
- purchase online and receive home delivery with expedited delivery.

The logistics costs of alternative purchase options in an omni-channel environment can vary significantly. Hence, the need to develop analyses (and models) by location category may be necessary to account for these differences.

The growth of BNPL

The use of BNPL purchase options by retailers continues to grow at a rapid pace both in the United States and elsewhere. Further, more long-established financial institutions have begun to enter the BNPL third-party provider landscape, joining upstart firms that initiated this financial option.

This will enhance the growth of BNPL as a purchase option that more and more retailers will implement.

As BNPL becomes more entrenched, it is important that firms understand the logistics implications and total costs for their operations of offering BNPL. Straightforward analytic models, such as those presented in this article, facilitate this needed evaluation of the logistics impacts of BNPL.

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1 Note that logistics and related costs include lost revenue from returns as well as third party financial fees.

2 Other variables pertinent to a particular firm can easily be added to those shown. One simply has to provide "before" and "after" data for any additional variable to be included.

3 Lost revenue before and after BNPL is originally input into Table 2 and shown again in Table 3 for clarity.

4 The actual breakeven point in this example where incremental sales become positive occurs if sales increase by 8.4% or more.

5 Although it is beyond the scope of this article, in general, a family or selected group approach for actual implementation purposes often represents a fruitful strategy. Similarly, firms may wish to pilot or prioritize an actual implementation, and a family or small group initial implementation can facilitate a pilot.

How is same-day delivery becoming a viable strategy for U.S. retailers?

The pandemic has changed the conversation. Now is the time to rethink long-standing practices for adoption of a same-day delivery strategy best suited to your operations.

Thomas O'Connor is a senior director, analyst for Gartner's supply chain enablers & consumer-retail team.

By Thomas O'Connor

Until recently, when a consumer was purchasing online from a retailer and evaluating delivery options at checkout, the faster the service the more the customer had to pay. However, this is no longer always the case. Some leading retailers have begun to offer a same-day delivery service that costs less than two-day delivery and is half the price of next-day shipping for U.S. consumers.

What is changing the paradigm when it comes to same-day delivery? While some of what we are seeing today is a result of strategies retailers began investing in pre-pandemic, the majority of the shift is a result of the growth in online shopping during the pandemic. Retailers were forced to rethink many long-standing practices, for example with online order fulfillment from stores, which has had a cascading effect on services such as delivery of goods purchased online.

The shift to decentralized fulfillment

According to a recent Gartner analysis of the fulfillment offerings of 50 fashion, apparel and footwear retailers in the United States, only 8% of retailers offer a same-day delivery service. This is because most retailers fulfill their online deliveries through a centralized model where orders are shipped from either a single fulfillment center or a select few fulfillment centers.

In the United States, parcels from retailers often need to travel many hundreds or thousands of miles to reach the end consumer. Further, traditional carrier networks, such as those operated by FedEx and UPS, are designed to service such large geographies, but not to provide same-day delivery. Expedited delivery services across these large distances are more costly than their slower, non-expedited services.

Target, the trailblazing mass merchant, was one of the first retailers to recognize the opportunity that a more decentralized fulfillment-from-store model could provide in terms of last-mile cost efficiency. In 2017, Target announced a strategic shift toward fulfillment from store, and within two years had moved from 30% to more than 75% of online orders fulfilled from its store network.

The benefits of the model were highlighted by Target CEO Brian Cornell who discussed in a 2019 earnings call with investors: “As we [Target] move digital fulfillment from upstream DCs to stores, we see a significant reduction in expense and we talked about a 40% reduction. When we go from an upstream DC to some of our same-day fulfillment offerings, like Order Pickup and Drive Up, we see a 90% reduction in costs.”

The impact of the pandemic

When Cornell made this statement, many retailers were skeptical of the scale of cost reduction achieved by Target through its fulfillment from store model. Specifically, many retailers questioned the cost benefits of picking and packing items in a store environment versus a fulfillment center while not seeing clear benefit in shifting away from their national carrier partners.

However, as with so many other things, the pandemic has changed the conversation. To ensure inventory did not sit idle during pandemic-related store closures, many retailers invested to develop, accelerate or advance their capability to fulfill online orders from stores. Most used this capability to support buy online pickup in store (BOPIS, also known as click and collect) or curbside pickup with a smaller proportion enabling ship from store capabilities.

Where online delivery orders are local to a fulfilling store location—e.g. within 5 miles, 10 miles or perhaps 20 miles—same-day parcel delivery may be possible through small, specialized delivery partners specific to a region or larger, crowdsourced delivery providers operating across multiple regions. And these same-day delivery partners typically provide services that are cheaper than the overnight or two-day delivery offerings from the national carriers. This means, at least in terms of transportation, same-day delivery is cheaper than the next- or two-day delivery services enabled through national carriers and shipped out of centralized fulfillment centers.

Evaluating same-day delivery strategies

If you already have a fulfillment from store operation in place and offer BOPIS, perhaps now is the time to consider exploring a same-day delivery offering. While you won’t have your full range of products available for same-day delivery, it may open an avenue to better service your shoppers with the products you do have in market in a more cost-effective way and without diminishing profitability.

One way to begin is by adopting crowdsourced last-mile delivery providers as a new component of your logistics strategy. These providers typically have four common process flows, or execution steps, that make them work—from both a service and cost perspective. They are as follows.

Orders processed in the platform. Online orders are processed through a virtual crowdsourcing platform and the data is aggregated and deployed at point of shipment—your distribution center, store, 3PL—wherever the pickup origin will take place.

Asset and route optimization. Orders are consolidated where possible and dynamically assigned an optimized route and the packages are dispatched to the optimized asset (i.e., mode of transport)—a parcel fleet, gig driver, cargo bike, delivery van—whatever combination of route and mode meets the delivery speed requirement at the lowest cost.

SMS/email track-and-trace notifications. Orders are scanned when loaded or picked up, initiating real-time, track-and-trace mobile alerts to the shipper, delivery driver and the customer.

Completed delivery and POD. The package arrives at the final delivery destination and the proof of delivery (POD) is electronically confirmed in real time.

Finally, to assess the success of any new same-day service (or other delivery service for that matter) the business should have clearly defined metrics to evaluate the success of the initiative. Common measures include: utilization rate of the same-day delivery service, on-time performance, net promoter score (NPS) or similar voice of customer (VoC) metric and cost-to-serve by fulfillment type.

Using governance to improve procure-to-pay

Adopting a global process owner can lead to improvements.

By Marisa Brown, senior principal research lead, Supply Chain, APQC

Marisa Brown is senior principal research lead, supply chain management, APQC. She can be reached at mbrown@apqc.org.

The procure-to-pay process is essential to businesses because it encompasses the processes of purchasing goods and services, receiving them and then paying for them so that an organization can in turn deliver a solution to customers. The process is also complex due to its many moving parts and the fact that it spans both the procurement and finance functions.

The challenge to many organizations is that these functions operate in silos rather than working as one seamless process. This situation presents an opportunity for organizations to streamline activities to ensure increased interaction and alignment between procurement and accounts payable.

The solution is to adopt an end-to-end process for procure-to-pay. This is a radical shift in thinking for many organizations, which still focus on function without considering procure-to-pay as one process that happens to span different business units.

We can see organizations' current thinking about procure-to-pay in how they set up governance for the business units involved in the process. As shown in Figure 1, only 30% of organizations have structured their procurement and accounts payable units into one team that reports to the same executive, and 28% of organizations have these functions as separate teams reporting to separate executives.

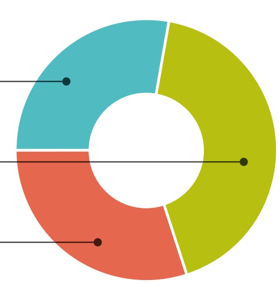
FIGURE 1

Procure-to-pay process governance

Procurement and accounts payable are **separate teams** reporting to **separate C-suite executives** **28%**

Procurement and accounts payable are **separate teams** reporting to the **same C-suite executive** (e.g., CPO or CFO) **42%**

Procurement and accounts payable are **one integrated team** reporting to the **same C-suite executive** (e.g., CPO or CFO) **30%**



Source: APQC

APQC's research into procure-to-pay has shown that moving to an end-to-end model enables a holistic view that helps communication and collaboration between the procurement and accounts payable groups. Additionally, it can support organizations in their supply chain areas of focus, as many have made procure-to-pay a top area of focus for 2022. Yet adopting a new model is not an undertaking that organizations should enter without first considering how to lead the change and ensuring that internal communications are maintained throughout the effort.

Procure-to-pay as a priority

Factors related to procure-to-pay are priorities for supply chain organizations this year. Among organizations participating in APQC research, process standardization was one of the top five trends anticipated to impact supply chains over the next three years. This shows a willingness among organizations to update processes such as procure-to-pay to better align and define activities.

When it comes to implementing improvements to supply chain processes, a lack of collaboration across functions and externally is the primary obstacle hindering organizations' improvement (Figure 2). Limited workforce engagement and communication challenges are also among the top five obstacles.

Internal collaboration is key to ensuring business units are aligned in their procure-to-pay activities. Further, collaboration with external groups, namely strategic suppliers, is essential to ensuring that an organization's supplier relationship management efforts are working toward mutual goals.

Communication helps ensure that efforts remain aligned across business units and that any challenges are addressed. Adequate communication is also key to conveying the importance of the procure-to-pay process internally so that purchases are made, and vendors are paid, in a timely manner.

Collaboration, communication and workforce engagement are closely related: Collaboration not only supports work across groups but also increases workforce engagement and helps organizations to overcome communication challenges. Organizations must work on all three factors to support improvement of the end-to-end procure-to-pay process.

Overall, supply chain professionals are focused on improving their procurement functions in 2022. In its annual survey of supply chain professionals, APQC found that supplier relationship management (SRM) is the top focus area in sourcing and procurement for 2022 (Figure 3). Procure-to-pay is among the top three focus areas.

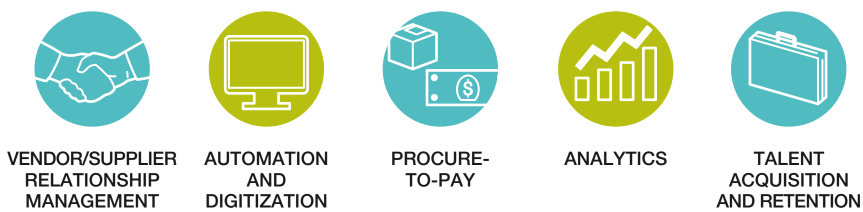
FIGURE 2

Top obstacles to improving supply chain processes

Source: APQC

FIGURE 3

Top five 2022 sourcing and procurement focus areas



Source: APQC

SRM is closely linked to the procure-to-pay process. How well an organization conducts SRM can make an impact on its ability to order and receive materials in a timely manner. This partly relies on the organization's collaboration and communication capabilities; without the ability to develop closer external relationships, the organization's procure-to-pay activities will suffer.

Start improvement with governance

Many of the challenges arising within an organization's procure-to-pay activities stem from a lack of clarity about roles and responsibilities. Especially if the procurement and accounts payable units have a separate reporting structure, there may not have been an explicit division of tasks between units. As a result, staff members may see the process as too complex and shift their focus to day-to-day tasks rather than strategic work.

APQC member organization ScottMadden has identified and shared three symptoms that indicate an organizations procure-to-pay process needs improvement. They are as follows:

1. Unclear roles. Employees in roles intended to focus on transactional activities are asked to take on strategic work, or vice versa.

2. Activity without achievement. Business units or vendors see the organization's procurement activities as inhibiting what they need to accomplish.

3. Uncertain service areas. Procurement has centralized activities and other business units are uncertain of how to access procurement, which may lead other units to try to work around the procurement process.

The solution to these problems is an overhaul of the end-to-end procure-to-pay process to one that includes the following:

» clear role definitions;
» effective processes and systems; and
» business unit access to procurement through multiple channels.

Benefits of a single owner

A key component of improving procure-to-pay, and an essential way of ensuring a successful update of the procure-to-pay process, is to give the end-to-end process a single owner. This helps to avoid some of the common issues that arise when business units operate independently of each other.

One such issue is the inability to consider the impacts procurement and accounts payable have on each other and the organization's external relationships. For example, a decision to hold off on paying a particular supplier can affect the relationship between procurement and the supplier.

The effects can extend to the vendor's ability to continue providing goods and services to the organization. Identifying one process owner supports a balanced approach to refining an organization's procurement and accounts payable capabilities, ensuring that process improvements do not negatively affect the activities of either business unit.

The individual filling the process owner role must have skills beyond those related to procurement or finance. Relevant expertise enables the individual to take a holistic view of the end-to-end process, but soft skills enable the process owner to bring units together that have not necessarily interacted before and to lead staff who may be hesitant to change.

Build on improvement

Many organizations have prioritized the improvement of their procurement processes this year and procure-to-pay is among the top areas in which organizations plan to dedicate their efforts. Adopting central governance of procure-to-pay offers organizations the chance to streamline efforts that will lead to greater communication and collaboration both with internal business units and external vendors. It also sets the stage for an update of an organization's procurement model to optimize performance. Design and implementation of a new procurement model involves a deliberate process of gathering information on current performance, designing the model and then implementing the model.

When assessing current procurement performance, an organization may conduct site visits and interviews to understand the customer (and stakeholder) experience; assess current work activities and performance metrics; gauge satisfaction among customers (and stakeholders); and evaluate leading practices among peers and competitors. The results of these assessment efforts then inform the design of the model.

Implementation of a new model requires multiple workstreams that include planning and project management throughout. The organization will need to consider policies and procedures, organization and staffing, communication and change management, necessary technology and facilities changes that can result from a new model. The organization should ensure that stakeholders for the procure-to-pay process are involved early and often throughout the process.

It is also important that responsibilities and accountabilities are made clear early on so that staff members can understand any changes to their work.

The effort of revamping procure-to-pay takes time, but there are indicators that show whether the efforts are successful. When done properly, positive results from the model can be seen soon after launch. Stakeholders clearly understand the process and system changes that come with the new model and procurement and accounts payable staff members are clear on their roles and responsibilities. Organizations' reporting and analytics provide transparency into purchasing and payables status and spend. Additionally, the organization's suppliers are aware of the change and begin to see benefits from improved efficiency and reduced transaction costs.

Organizations are poised to make positive changes to their procure-to-pay process. To streamline efforts and increase the collaboration and communication between procurement and accounts payable, organizations should adopt centralized governance of the end-to-end process. They can build on this by revising their procurement and payables models to ensure the greatest alignment that leads to results seen soon after launch.

About APQC

APQC helps organizations work smarter, faster and with greater confidence. It is the world's foremost authority in benchmarking, best practices, process and performance improvement, and knowledge management. APQC's unique structure as a member-based nonprofit makes it a differentiator in the marketplace. APQC partners with more than 500 member organizations worldwide in all industries. With more than 40 years of experience, APQC remains the world's leader in transforming organizations. Visit us at apqc.org and learn how you can make best practices your practices.

SUPPLYCHAIN MANAGEMENT REVIEW

Top 50 Trucking: PEDAL TO THE METAL

Leading carrier executives say a key strategy for staying on top is creating a company culture that "sets the tone for everything and everybody." Investing in new equipment, driver training and salaries doesn't hurt either.

BY **JOHN D. SCHULZ**, EDITOR AT LARGE

In the mid-1990s, a trucking entrepreneur named Bob Robertson, then ascending to the top ranks of the industry as chief of Con-way Inc., turned some heads with a statement that every trucking executive should have memorized. When asked about his company's success, Robertson thought a minute and then recited a line made famous by management guru Peter Drucker: "Culture eats strategy for breakfast seven days a week."

Con-way is long gone—now a part of XPO Logistics—and Robertson has retired to Florida. But the quote still works. When considering what keeps the Top 50 carriers atop *Logistics Management*'s annual listing during the uneven freight years

since the COVID-19 pandemic upended nearly everything, betting on a company's culture is still relevant today.

"Culture is first and foremost," says Greg Orr, president of CFI and executive vice president for U.S. truckload for TFI, the 17th-largest TL carrier. "It sets the tone for everything and everybody."

The secret to a great company's culture, Orr explains, "is having the right players with you who are as good or better than you. Having a committed group who know where we need to improve and are able to tie everything to that. Then they have ownership and take accountability to drive you to the results that you need."

TOP 25 LESS-THAN-TRUCKLOAD CARRIERS: 2021 REVENUES

(Including fuel surcharges)

Rank	Carrier name	2020 Revenue ($ million)	2021 Revenue ($ million)	YoY % Change 2020-2021
1	FedEx Freight*	$7,115	$8,594	20.8%
2	Old Dominion Freight Line*	$3,961	$5,177	30.7%
3	Yellow Corp*	$4,488	$5,078	13.1%
4	XPO Logistics*	$3,575	$4,192	17.3%
5	Estes Express Lines	$3,068	$3,783	23.3%
6	TFI International (US Only)*	$2,898	$3,179	9.7%
7	ABF Freight System*	$2,036	$2,518	23.7%
8	R+L Carriers	$1,973	$2,427	23.0%
9	Saia Motor Freight Line*	$1,822	$2,289	25.6%
10	Southeastern Freight Lines	$1,256	$1,476	17.5%
11	Averitt Express	$831	$1,093	31.5%
12	Central Transport Int'l	$871	$1,046	20.1%
13	Dayton Freight Lines	$669	$863	29.0%
14	Forward Air*	$626	$831	32.7%
15	Pitt Ohio Transportation Group	$653	$780	19.4%
16	AAA Cooper Transportation	$592	$653	10.3%
17	A. Duie Pyle	$380	$481	26.6%
18	Roadrunner Transportation	$430	$430	0.0%
19	Daylight Transport	$270	$380	40.7%
20	Oak Harbor Freight Lines	$237	$284	19.8%
21	Central Freight Lines	$256	$262	2.3%
22	Ward Trucking Corporation	$183	$230	25.7%
23	Midwest Motor Express	$120	$137	14.2%
24	Magnum LTL	$74	$118	59.5%
25	Dependable Highway Express	$87	$117	34.5%
TOTAL TOP 25 LTL CARRIERS		**$38,482**	**$46,418**	**20.6%**
ALL OTHER CARRIERS		**$3,623**	**$4,284**	**18.2%**
TOTAL LTL MARKET		**$42,105**	**$50,702**	**20.4%**

*Publicly Traded Company
Note 1: Revenue for U.S. LTL operations primarily, and includes revenue from fuel surcharge and shipments weighing over 10,000 pounds
Note 2: Shipment volume increased by 7.1% and tonnage by 7.7% in 2021 over 2020
Note 3: Fuel surcharge represented 2.9% increase in revenue in 2021 over 2020
Note 4: With 2021 having 1 to 2 fewer operating days than 2020, revenue per day was even higher than listed above.
Source: Companies and SJ Consulting Group estimates
Prepared by SJ Consulting Group, Inc.

TOP 25 TRUCKLOAD CARRIERS: 2021 REVENUES

(Including fuel surcharges)

Rank	Carrier name	2020 Revenue ($ million)	2021 Revenue ($ million)	YoY % Change 2020-2021
1	Knight-Swift Transportation*	$3,786	$4,098	8.2%
2	J.B. Hunt Transport*	$2,659	$3,374	26.9%
3	Landstar System*	$2,033	$2,932	44.2%
4	Prime	$2,088	$2,207	5.7%
5	Schneider National*	$2,066	$2,201	6.5%
6	Werner Enterprises*	$1,826	$2,023	10.8%
7	Penske Logistics	$1,101	$1,851	68.1%
8	CRST International	$1,388	$1,586	14.3%
9	U.S. Xpress Enterprises*	$1,513	$1,568	3.6%
10	Ryder Dedicated Solutions*	$1,229	$1,457	18.6%
11	Crete Carrier Corp.	$1,171	$1,304	11.4%
12	Daseke*	$1,182	$1,249	5.6%
13	PS Logistics	$832	$982	18.1%
14	Western Express	$722	$977	35.4%
15	Ruan Transportation	$812	$875	7.8%
16	CR England	$888	$861	-3.0%
17	TFI International*	$714	$856	19.9%
18	NFI Industries	$756	$855	13.1%
19	Marten Transport*	$689	$726	5.4%
20	Stevens Transport	$638	$702	10.1%
21	Anderson Trucking Service	$600	$665	10.9%
22	Cardinal Logistics	$620	$658	6.2%
23	Covenant Transportation *	$591	$623	5.5%
24	Heartland Express*	$645	$607	-5.9%
25	Mercer Transportation	$480	$602	25.4%
TOTAL TOP 25 TRUCKLOAD CARRIERS		**$31,029**	**$35,839**	**15.3%**

*Publicly Traded Company
Note 1: Revenues primarily for TL operations and may include a small percent of non-truckload services
Note 2: During 2021, revenue gains came on the heels of loads increasing by 5.3 percent and loaded miles decreasing by 3 percent
Source: Company Reports and SJ Consulting Group estimates

Of course, performing the “nuts and bolts” of trucking—doing the job safely and efficiently for all customers at fair rates—is tantamount to success.

“When I think of the top carriers, it’s safety and service,” says Darren Hawkins, CEO of Yellow Corp., which controls 10% of the less-than-truck-load (LTL) market as the 3rd-largest LTL carrier. “That was the case when I began in this industry 30 years ago, and it’s still the case today.”

Analysts say that the best, most profitable trucking companies are that way because they price their services—all of them, including accessorials such as inside delivery or specialized handling—correctly and accurately. Such accessorials used to be about 5% of revenue in the $46 billion LTL sector. They’re now close to 10%, a sign of overall health of the LTL sector which collectively posted an 85 operating ratio (OR) last year.

“They have discipline in charging for the services they’re providing,” says Satish Jindel, principal of SJ Consulting, which closely tracks the profitability of the industry. “The best carriers don’t let shippers allow drivers to wait for hours at their docks. They charge for detention and special services.”

Let’s take a deeper dive into what’s keeping the best carriers in the *Logistics Management* Top 50. They’re producing some of their best incomes during a period when the pandemic ruined long-term planning, inflation is wreaking havoc with budgets and qualified drivers are in short supply. Let’s better understand why this is happening.

Residual COVID effects on costs

The pandemic has upended everyone’s plans. New truck orders are being cut by a third or more because of the worldwide shortage of microchips. And if this past year has convinced trucking executives of anything, it’s that those shortages of certain goods and gadgets can occur at any time.

Chuck Hammel, president of Pittsburgh-based Pitt Ohio, the 15th-largest LTL carrier, says that buying new Class 8 trucks is like playing roulette. Sometimes your number comes up, sometimes it doesn’t.

Hammel related a quick story of a big truck manufacturer telling him that 15 of his new trucks were being delayed because of lack of sideview mirrors. He was incredulous. “That’s a piece of equipment that probably costs $15,” he says. “But it held up our order for four months.”

Experts who watch this market closely say get used to it. Supply chain disruptions have become our new normal, and everyone should expect them in the foreseeable future. Then, there’s cost. New Class 8 trucks exceed $150,000 these days, but used truck valuations have soared as well.

“Availability of equipment is a big factor,” says Avery Vise, trucking analyst for research firm FTR. “A three-year-old used truck costs as much as a new one.”

It’s the same on the truckload side. “The strategy seems to change daily nowadays,” says CFI’s Orr. “With the pandemic, supply chain disruptions and the driver shortage, inflationary pressures are on everything.”

The hunt for drivers

It would be great if we could report trucking companies have solved their decades-old driver shortage—but that would be overly optimistic.

In fact, most trucking execs say it’s worse than it’s ever been. The American Trucking Associations estimates that we’re currently short about 80,000 qualified drivers. What’s even harder to believe is the projection that the industry will need 1 million new drivers over the next decade.

Yellow Corp. has decided to take recruiting in-house. It recently added two new driving academies to its stable of 14 schools to prepare the next generation of professional truck drivers for careers in transportation. They’re tuition-free and designed to help ease the driver shortage.

“I don’t think that any trucking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company has all the drivers it needs," says Yellow's Hawkins. "But playing musical chairs is not the answer." Still, the best companies have persevered through internal recruitment and training of new drivers rather than "poaching" drivers from rivals.

"It's not easy, but we've added 1,800 drivers in the past year," says Kevin "Marty" Freeman, executive vice president and COO of Old Dominion Freight Lines. "About 600 have graduated from our internal driving school. It hasn't been easy, but we feel we've kept up with the influx of freight."

Partially to appease drivers and to keep its fleet young, CFI is acquiring 770 Kenworth T-680 Next Generation tractors. They're equipped with safety technologies and driver conveniences most in demand by today's drivers. It's also buying 250 new 53-foot trailers, including 100 dry-van general freight trailers and 150 refrigerated trailers supporting the growth of its reefer unit.

However, with that comes higher costs. CFI's 3,000 drivers recently received a two-cents-a-mile pay hike that Orr says probably won't be the last raise of 2022. "I've been here four years and we've had no less than one pay increase a year," he says. "There's probably another one coming this year. We're trying to boost our pay to stay competitive, but we also have competitors out there doing pretty astronomical things."

Carrier executives count four specific spikes or changes in the COVID variant that has disrupted supply chains, and they've had to find new ways to communicate with customers, employees and their original equipment manufacturers. "A big piece to me is trying to figure out how to do business in a different manner since we weren't sitting in front of customers and drivers face to face," says Orr. "We're used to having that open culture where everybody is accessible, and it's been hard."

"It's a wonderful time to be in trucking, especially LTL…I don't see any end to this for the next two or three years."

—Satish Jindel, SJ Consulting

Facing new challenges

Carrier executives agree that there were several challenges in both global and U.S. supply chains that they'll all have to face together this year.

"There are no easy fixes to the challenges that shippers may experience in the LTL marketplace or within any other segment of the supply chain this year," says Kent Williams, executive vice president of sale and marketing for Averitt Express. "Carriers are helping shippers navigate these unique times."

For instance, Averitt is encouraging customers to take advantage of cross-docking at its facilities located near seaports. This allows them to invest in staging safety stock within distribution and fulfillment centers and to consider using inland ports such as the Appalachian Regional Port or Inland Port Greer in South Carolina.

These are a few ways carriers and shippers can work together to bypass some of the congestion, and to also avoid potentially expensive *per diem* and demurrage fees, carrier executives said. "Simply put, it's going to take a bit of time for LTL capacity and demand to reach an equilibrium," predicts Williams.

The rate situation

Everything in trucking works like a pendulum. Supply-and-demand equations swing back and forth. But there's no doubt that in 2022, carriers have the upper hand.

In fact, nothing blares recovery more than Yellow's balance sheet for last year. While its LTL tonnage declined 3.3%, its revenue per hundredweight rose a whopping 16.4% year over year. Excluding the fuel surcharge, it was up 12.5%.

ABF Freight System, the nation's 7th-largest LTL carrier, achieved an 89.9 operating ratio for last year. As a result of the Teamsters' profit-sharing plan with ABF, that kicked in a 3% bonus for all covered ABF employees on top of their yearly earnings, estimated to be at least $70,000. ABF parent ArcBest Corp. had a net income last year of $213.5 million, up from $71.1 million in 2020.

Old Dominion Freight Line reported net income rising 53.8% to a record $1.03 billion profit in 2021. As for rates, Old Dominion's Freeman says that "with inflation we're experiencing rising prices on everything from steel to aluminum. We feel we have to raise our prices to keep our value proposition and maintain profitability. As long as we keep our service levels where they are, I think our customers understand."

The long-beleaguered LTL industry, once seen as moribund, led all trucking sectors with a collective 85 OR last year, outperforming both truckload and parcel, according to SJ Consulting.

"It's a wonderful time to be in trucking, especially LTL," adds SJ analyst Jindel. "I don't see any end to this for the next two or three years."

John D. Schulz is an editor at large for Supply Chain Management Review

Look back at Modex

Modex 2022 was the largest to date, with registrations reaching 37,047—a 20% attendance jump over the pre-Covid Modex 2018. The four-day show (March 28-31) covered 405,000 net square feet of exhibit space at Atlanta's Georgia World Congress Center with 857 exhibiting companies. Here's a glimpse of what our editors saw at the show.

Dematic showcases fulfillment automation tools' interactive zones

Dematic's booth invited attendees to experience interactive zones tailored to grocery, apparel, food and beverage, and general merchandising industries. Touchscreen monitors provided attendees with information about the company's various fulfillment tools.

Tools include Dematic Smart Task Activation, an order fulfillment management software that increases operational effectiveness by synchronizing workflows in real time, as well as Dematic Micro-Fulfillment, which moves e-commerce fulfillment closer to the customer base for the shortest possible pickup and delivery times.

Dematic's team in the booth invited attendees to experience interactive zones tailored to different industries.

"As a result of our customer focus and a dedication to innovative problem solving," said Dematic Americas' EVP Mike Larsson, "we've seen tremendous growth and are looking forward to more exciting things to come for Dematic and our customers this year."

Modex 2022 attendees also experienced Dematic Mixed Case Fulfillment, which delivers efficiency in the entire distribution center to retail and grocery replenishment supply chains, plus Dematic Depalletizer/Palletizer, a robotics system that provides dual functionality by operating as both a palletizer and depalletizer. Dematic Mobile Automation is a family of systems for automated load transport within a facility.

KNAPP stresses its extensive software capabilities

KNAPP emphasized its extensive software capabilities as a means of supporting flexible distribution that spans omni-channel, e-commerce and retail fulfillment.

Heimo Robosch, executive VP of sales for KNAPP AG, commented that while KNAPP historically was known for the quality of its automation systems like shuttles, it is the company's expanding software capabilities that are the root of much of the value its solutions provide today, and allow its solutions to address multiple needs, including omni-channel, e-commerce and retail fulfillment. Robosch added that the North American market now accounts for about 40% of KNAPP's business, with strong global growth overall.

KNAPP's KiSoft software suite offers multiple functions, including predictive analytics and maintenance. KNAPP also discussed its robotic order picking solution, which leverages artificial intelligence (AI) based technology from its partner Covariant. At the press conference, KNAPP discussed a new software tool called KiSoft Genomics that accelerates and simplifies gathering of master data for its robotics picking solution.

Josef Mentzer, CEO for KNAPP in North America, added that the company is rapidly expanding its US-based workforce and has added a software controls training center at its Kennesaw, Ga., U.S. headquarters to support customer needs and build software expertise.

Heimo Robosch, executive VP of sales, KNAPP AG, at the company's press conference.

Kardex showcases AS/RS technologies using Augmented Reality

Well known for its vertical lift modules, vertical carousel modules and vertical buffer modules, Kardex has added a new product offering—AutoStore, a cube-based robotic picking technology.

"The addition of a cube-based robotic picking technology complements our existing product offering to better solve the intralogistics challenges of our customers," said Christina Dube, Kardex's director of marketing in North America. "Using augmented reality, you can see your warehouse come to life using Kardex automated solutions throughout your facility."

From order picking to kitting and buffering, Kardex solutions support a variety of industries and applications. Implementing scalable automation and intuitive inventory management software enables increased space utilization, higher picking throughput and improved labor efficiencies.

In addition to AS/RS and software solutions, Kardex offers various lifecycle services to support your systems—both in-person and remotely—to keep your business running smoothly.

Kardex highlighted its digital solutions.

Big Joe debuts BUD collaborative robot

Big Joe Forklifts previewed several new products, including the company's vision for a new breed of semi-autonomous machines known as "co-bots," or collaborative robots, that keep humans in the loop within materials handling workflows to deliver maximum value.

Nicknamed "BUD," Big Joe's User Directed Pallet Mover showcases the company's User Directed Automation concept. It features a simple onboard tablet and Cloud connection to drive autonomously on custom missions once an operator manually loads a pallet and tells it where to go. "Automation as we know it in material handling is about to be turned upside down by products like BUD," said Bill Pedriana, CMO.

BUD was available for demonstration at Modex and also later this year through a subscription service costing less than $50 a day in partnership with Vecna Robotics, whose technology powers the system. The Big Joe team also showcased a host of lithium powered lift trucks including the new RPL44 low profile rider pallet truck and PTT60 powered pedestrian tugger.

OPEX unveils next generation goods-to-person technology

OPEX Corporation showcased the Infinity automated storage and retrieval system. Engineered for maximum flexibility and scalability in both throughput and storage, the solution is ideal for multiple applications, including omni-channel distribution, store replenishment, micro-fulfillment and e-commerce.

"The Infinity system offers unparalleled storage density, configurability and flexibility to power business today and in the future," said Alex Stevens, president of warehouse automation. "This is the next generation of automation."

The configurable rack design allows for maximum warehouse space utilization around obstructions or other equipment, accommodating various workflows and site layouts. A single Infinity iBOT wireless robotic vehicle travels under the storage structure and passes through the aisles, minimizing distance and saving time. Carrying up to 70 pounds, Infinity iBOTs have access to the entire storage array and deliver totes to decoupled presentation ports outside of the system. The system is easily scalable by adding more iBOTs, presentation ports and grids.

Alex Stephens, VP of warehouse automation, introduced the Infinity system.

Locus Robotics displays fleet of autonomous robots

Locus Robotics took warehouse fulfillment and supply chain management to the next level with the introduction of its new, fully integrated, intelligent fleet of autonomous mobile robots (AMRs).

The new Locus fleet of purpose-built AMRs, consisting of Locus Origin, Locus Vector and Locus Max, are designed to double and triple productivity in all types of dynamic fulfillment and distribution environments.

"The Locus solution enables organizations to easily adapt and scale to changing volumes and demands quickly and cost effectively, with an ROI in months rather than years," said Rick Faulk, CEO.

Powered by LocusOne, the industry's smartest warehouse orchestration platform, Locus ensures optimal productivity, ease of use and efficiency, assigning the right bot for the mission.

Jason Walker, VP of market development with Locus Robotics, and Rick Faulk, CEO of Locus Robotics, with a Locus Vector bot that can handle up to a 600-pound payload.

Mike Futch, CEO and president of Tompkins Robotics, and Chen Hongming, SVP and special assistant to the chairman's office at GLP China, discussed the company's tSort3D.

Tompkins Robotics introduces tSort3D

At a press conference on Monday, Tompkins Robotics revealed its tSort3D, among other products.

Expanding upon the capabilities of the previously released tSort product lineup, the tSort3D provides users a powerful unit sortation system that will enhance their destination density and volume considerably.

Offering users manual and robotic induction, among other induction stations, the unit sortation system can also be combined with goods-to-person (G2P) systems. Able to hold 24 to 48 destinations at a time, the system allows users to remove their orders individually or, if they prefer, one entire bank of orders—from 12 to 24—can be removed all at once.

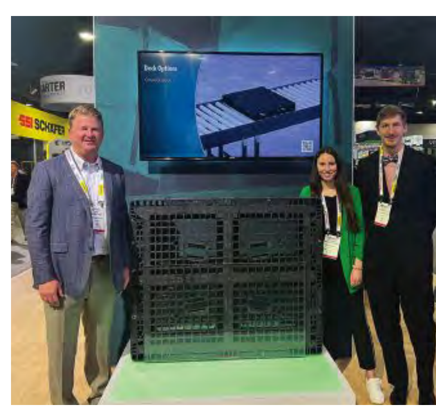
"Just as importantly, when compared to traditional automated sortation solutions, tSort3D provides four to 25 times the amount of order sort destinations that they're able to," said Mike Futch, CEO and president of Tompkins Robotics.

Orbis exhibits Odyssey plastic pallet

ORBIS Corporation showcased the 40 x 48-inch Odyssey pallet, which provides stability and unmatched durability with approximately 36 times the lifespan of a whitewood stringer pallet. "In testing from the Virginia Tech Center for Packaging and Unit Load Design, the Odyssey plastic pallet completed 400 cycles without failure," said Alison Zitzke, senior product manager at ORBIS, "while the wood pallet's average failure was 11 cycles."

In addition to its cost-saving and sustainable advantages, the pallet's unique design features—including optional steel reinforcements and molded-in frictional elements—help minimize load shifting and prevent slippage off fork equipment.

While designed to support loads of 2,800+ pounds, the Odyssey pallet is built to be easily moved, as well as interface seamlessly with automation. The Odyssey is also easily cleanable, keeps plants free of wood chips, and protects products from damage caused by nails or loose boards associated with wood pallets.



The ORBIS team showcased the company's latest reusable, sustainable pallet solution.

Honeywell & Clearpath deliver autonomous mobile robots to warehouses

Honeywell announced a strategic collaboration with Clearpath Robotics, giving warehouses and distribution centers the ability to easily automate operations and increase supply chain productivity through autonomous mobile robots (AMRs).

This partnership gives Honeywell an additional solution to ensure customers can meet and exceed operational demands. "AMR capability will enable customized workflows and provide an interface to our existing robotic and storage systems—expanding our integrated solution offerings," said Thomas Evans, CTO of Honeywell Robotics.

The Clearpath partnership gives Honeywell Intelligrated customers a complete suite of fixed and mobile robotics solutions, backed by expert systems integration, solutions development and reliable 24/7 technical support.

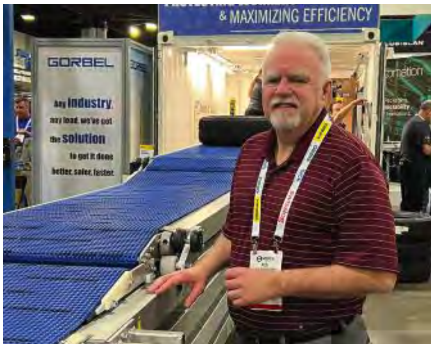
Honeywell offered demos of Clearpath's AMRs working with Honeywell's Smart Flexible Depalletizer solution at their booth, illustrating the benefits of integrating AMRs into the warehouse to help achieve optimum results in current operations or build the foundation for future fulfillment requirements.

Gorbel showcases warehouse and overhead solutions product lines

Gorbel Inc. showcased its full range of customer solutions. This was the first trade show where Gorbel's booth featured both the overhead and warehouse sides of its business since acquiring Engineered Lifting Systems, and its Destuff-it and Restuff-it product lines.

Gorbel's traditional overhead solutions include a workstation crane, G-Force and Easy Arm ergonomic lifting devices, a GS Series Hoist and Tether Track fall protection anchors. The Destuff-IT ergonomic conveyor systems help DC workers unload containers faster and with fewer injuries.

"Our products take the stress off of the worker while also helping to increase productivity," said Rob Beightol, marketing director. The company's new tractor drive for motorized movement of its cranes delivers industry leading power and performance, but at a fraction of the size of other mass-produced tractor drives on the market.



Rob Beightol, Gorbel's marketing director.

Christopher VanDeWiele, a product manager for MHS, pointed out how HAI's ACR robots bring goods to a Mujin robotic piece picking system, as part of MHS's new goods-to-robot solution.

MHS teams with partners on automated order fulfillment solution

MHS, a provider of materials handling automation and software solutions, unveiled an integrated, robotic order fulfillment solution developed in tandem with Mujin and HAI Robotics.

The goods-to-robot solution, which is managed by MHS's Helix warehouse execution system (WES), boasts operational efficiency gains of up to 400%. A zero-pressure accumulation conveyor from MHS feeds totes to and from the order fill station. HAI's autonomous case handling robots (ACRs) transport totes between storage and a Mujin piece picking robot. The Mujin robot picks each item for the order from a source tote, packs it and signals to Helix that the conveyor can move the completed order to the outbound location.

"By bringing together these different automation technologies to work together as a cohesive system, we can help customers not only address labor challenges in workflows like order picking, but improve overall efficiency and consistency too," said Rob Schmit, senior VP, distribution and fulfillment, MHS.

Jungheinrich showcases AGVs

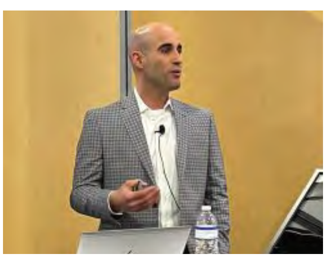
Jungheinrich held a media event with a variety of product demonstrations. Company leaders focused on two automatic guided vehicles (AGVs): the EZS 350a NA (based on Jungheinrich's standard series tow tractor) and the EKS 215a (based on its stacker).

Combining mechanical engineering with precision navigation technology, ensuring highly effective, reliable production, the EZS 350a NA can be used in mixed operations mode with manual trucks and pedestrians. With laser navigation, and capable of towing up to 11,000 pounds, the electric tow tractor decreases delivery times to assembly and production lines, and it enables the automated handling of repeatable transport processes to each.

The EKS 215a, a stacker capable of handling loads up to 3,300 pounds, is ideal for mixed operations with manual trucks and pedestrians in warehouses and production areas. Featuring a 24V lithium-ion battery, the stacker has an automatic charging function, along with a user-friendly HMI touch display.

"These systems are offering attendees a look at the possibilities where AGVs can be solutions to automate redundant, mundane tasks," said Kai Beckhaus, president of Jungheinrich AG's and Mitsubishi Logisnext Americas' automation joint venture, MCJ Supply Chain Solutions. "Additionally, they'll streamline processes for higher productivity and reallocate employee resources to higher-value jobs."

Kai Beckhaus, president of MCJ Supply Chain Solutions; John Sneddon, executive VP, sales and marketing for Mitsubishi Logisnext Americas; and Timothy Harrison, director of AGV sales, North America for Jungheinrich, showcased the company's AGV solutions.



Sean Wallingford, Vanderlande's president, Warehouse Solutions, North America, explained the scope of innovations from the company.

Vanderlande exhibits portfolio of systems

Vanderlande Industries demonstrated a portfolio of its systems. ADAPTO, a roaming shuttle-based automated storage and retrieval system (AS/RS), was a primary focus, as its ability to sequence and prioritize orders—while also roaming warehouse levels and aisles without lift platforms—was discussed. The AS/RS enables warehouses to use one-to-one and direct connect pick stations, which enhances fulfillment operations' accuracy and efficiency.

The company also showed its modular goods-to-picker (GtP) workstations, which can be integrated with ADAPTO. Enabling one-to-one picking, along with sequencing for batch and discreet approaches, the ergonomic workstations help users enhance pick performances with minimal training."The materials handling industry is experiencing immense pressure, but, in that, lies a multitude of unexplored opportunities," said Sean Wallingford, president of warehouse solutions, North America at Vanderlande. "Due to dynamic consumer demands, companies must operate their DCs efficiently and scale quickly in peak periods."

Alongside ADAPTO and the GtP workstations, the company also presented its Pallet AVs (autonomous vehicles) and next-gen software stack (intelligent software).

EnerSys displays Li-ion and TPPL batteries

EnerSys showcased its NexSys iON Lithium-ion (Li-ion) batteries and NexSys PURE Thin Plate Pure Lead (TPPL) batteries. Designed to enhance user productivity, while reducing operational costs, the batteries are environmentally friendly. In particular, they decrease carbon dioxide emissions and water consumption. When used together, the batteries can eliminate 13 gallons of distilled water usage on a weekly basis.

Developed with heavy-duty applications in mind, the NexSys iON batteries deliver high energy capacity, as they've also been manufactured with high performance cells.

The NexSys PURE batteries, which have been enhanced for fast- and opportunity-charging, are especially ideal for light- to medium-duty applications. "In comparison to flooded lead acid batteries, both batteries are more energy efficient per charge—up to 28%," said Harold Vanasse, senior director of marketing, motive power global at EnerSys.

Harold Vanasse, senior director of marketing, motive power global, EnerSys, exhibited the company's NexSys battery lineup.

Berkshire Grey offers robotic system for autonomous e-commerce autobagging

Peter Blair, VP of marketing for Berkshire Grey, with the BG RPPi solution.

Berkshire Grey, a provider of artificial intelligence (AI)-enabled robotic solutions, introduced its new Robotic Pick and Pack with Identification (BG RPPi) system, which now includes auto-identification and item manipulation technology for touchless e-commerce autobagging.

The solution uses AI to discern how to optimally grasp items, holds them up for an auto-ID scan, uses AI to orientate items of various shapes and sizes for correct placement into an autobagger, then drops or places the item into the autobagger.

"This system helps retailers increase their fulfillment throughput capacity while using sustainable autobagging approaches," said Kishore Boyalakuntla, VP of product at Berkshire Grey. "With BG RPPi for eCommerce Autobagging, we can now help retailers enable a touchless pick-to-ship fulfillment operation that is fully autonomous, thereby reducing labor dependency and increasing overall productivity."

Rite-Hite features various smart controls and sensors

Smart dock controls help by visualizing cycle times and providing data for continuous improvement, explained Moiz Neemuchwala, Rite-Hite VP of digital solutions.

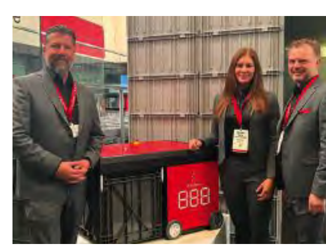
Rite-Hite displayed a variety of smart controls and sensors that connect the company's loading dock and in-plant equipment with its Opti-Vu smart data and analytics platform. Dok-Lok vehicle restraints can track restraint engagement time to help identify downtime between loading activities, alert dock attendants if docks are at risk to incur costly detention and demurrage charges, and monitor if the restraints are in fault mode due to misuse or faulty/missing rear-impact guards.

The OptiVu-enabled FasTrax industrial door, can track energy usage, along with operational trends, including unnecessary openings and false activations. Consequently, it helps facilities address employee behaviors and equipment issues, identifying ways to improve productivity and energy loss.

The Safe-T-Signal intersection warning system tracks traffic patterns and intersections activity, while identifying potentially dangerous areas—data that can help managers implement changes that reduce accidents.

"It's crucial for logistics managers to have—and use—captured data to acquire operational insights, leading to enhanced efficiency and safety," said Moiz Neemuchwala, VP of digital solutions at Rite-Hite. "That's why our products and controls have smart technology, using sensors to capture data relevant to productivity, safety and energy."

AutoStore reveals R5+ Robot



AutoStore's booth featured the fifth-generation AutoStore Red Line Robot.

AutoStore showcased its R5+ Robot, the company's latest addition to its Robot fleet. Due to its ability to handle bins up to roughly 16.7 inches tall—the tallest bins that are currently available in the AutoStore system—the R5+ will allow warehouses to manage larger items.

"The beauty of innovation is that it often can be found in the simplest solutions," said Carlos Fernández, CPO of AutoStore. "The landscape of e-commerce has fundamentally changed over the past two years, and every improvement we make to the AutoStore system is to benefit retailers in their pursuits of the best customer experiences possible."

While using the R5+ with 16.7-inch tall bins, customers' maximum grid height will be higher than a grid with a R5 Robot that uses 12.9-inch tall bins. As a result, a grid, comprised of 14 layers of bins and nearly 19.8 feet tall, can be created.

"The R5+ enables companies to expand their market footprint to include a wider variety of products, all while providing fast and reliable service," Fernández added. "With the ability to incorporate larger bins, retailers can seamlessly adapt to changes in order demand, allowing them to maintain a competitive edge in their markets."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GLOBAL TRADE MANAGEMENT SOFTWARE UPDATE

Using technology to manage global trade complexities

With world trade volumes climbing and the dynamics of buying and selling overseas changing, companies need GTM software more than ever.

BY **BRIDGET McCREA**, CONTRIBUTING EDITOR

After experiencing a slight dip in 2020 due to the global pandemic, world trade made a strong comeback in 2021. Driven by a strong recovery in demand due to subsiding pandemic restrictions, economic stimulus packages and increases in commodity prices, world trade jumped up 23% to $28 trillion in 2021, exceeding the 2019 pre-pandemic total by nearly $3 trillion, according to the UN Conference on Trade and Development (UNCTAD).

During the third quarter of 2021 alone, global goods trade set a new all-time record when it reached $5.6 trillion, UNCTAD reports. And while the global semiconductor shortage, supply chain disruptions and various geopolitical factors may create a more uncertain environment in 2022, consumer demand for products doesn't appear to be waning.

This is music to the ears of shippers that continue to think outside of their domestic borders when sourcing and selling goods. Whether they're exporting, importing, or some of both, these companies need systems that can help them comply with complex trade regulations, navigate the changing tariff environment and facilitate the flow of information, goods and money across expansive, international supply chains.

Companies also need solutions that support any reshoring or nearshoring activities they may have planned or have already in progress. A company that relied heavily on Chinese sources of supply pre-pandemic, for example, may be diversifying that sourcing strategy to include more U.S.-based partners (reshoring) or those based in countries like Mexico and Brazil (nearshoring).

"It's not business as usual right now. Companies' operations have been disrupted and as a result they've had to change the way they've been doing things for the last 10 years or more," says Bill Brooks, vice president, North American transportation portfolio at Capgemini. "As they work to become more nimble, flexible and ultimately more profitable, these companies are increasingly turning to software for help."

Streamlining and automating key processes

Global trade management (GTM) platforms have long been seen as the solution of choice for companies doing business overseas. Over the last two years, these platform makers hunkered down and strengthened their positions as the global trade environment became increasingly complex and confusing.

By streamlining and automating processes associated with customs and regulatory compliance, global logistics and trade financing, their GTM platforms facilitate the flow of information, money and goods across buyers, sellers and intermediaries (including customs agencies), banks and freight forwarders.

Of course, with every new problem comes a new opportunity. In that regard, Brooks says he's seeing more GTM vendors step in to help companies manage the complexities of global trade.

By embedding artificial intelligence (AI), machine learning (ML) and other advanced technologies into their GTM platforms, for example, software developers are helping companies be more predictive about their global trade activities, better understand the evolving environment and move away from using spreadsheets, e-mails and phone calls to orchestrate transactions and agreements across their commercial trade partners.

"Companies need tools to help them analyze free trade opportunities, tariffs, new treaties and other variables in the global trade environment," says Brooks. "In response, GTM providers are realizing that if they made this tweak or change to their software, they can help customers eliminate manual sequences from the process, analyze different scenarios and get answers faster."

These and other GTM functionalities are helping companies tackle global trade requirements in a faster, more confident and compliant manner than they'd ever be able to manage using manual approaches.

Optimizing key processes

By supporting the complex and unique logistical, regulatory and financial aspects of the import and export processes associated with international trade, GTM helps companies orchestrate transactions across many different involved parties.

Those parties include, but are not limited to, freight forwarders, custom brokers, government agencies, lawyers, banks, insurance companies, consultants, customers and suppliers.

Looking around at the global trade management space right now, Oscar Sanchez Duran, senior principal research analyst for Gartner Supply Chain, says the two key focuses are optimizing processes and using more automation. By 2023, he expects at least 50% of large, global companies to be using ML-enabled GTM platforms.

"The inclusion of technologies like AI and ML in GTM solutions provides better insights in analytics and further improves the automation capabilities of these solutions," Sanchez Duran adds.

According to Sanchez Duran, AI and ML in GTM can help in many different areas. For example, he says ML is commonly used to more accurately calculate a shipment's estimated time of arrival (ETA). The platforms continually receive data from multiple sources (carriers, ports, satellite, weather, etc.). Once cleansed, reviewed and compared to historical data, that data helps companies build out better prediction models.

Artificial intelligence and machine learning are also being used in global trade management to reduce false positives and compliance risks during restricted party screening activities. The software manages this by filling in missing data in the files or by reducing time spent on the product classification process.

To fill in these and other gaps, the software uses natural language processing (NLP) to guide the end user to match product definitions to a specific harmonized system (HS) code. Commonly used throughout the export process for goods, these codes use a numerical method of classifying traded products and are used by customs authorities worldwide.

Sanchez Duran says he's also seeing increased emphasis placed on business networks in the global trade environment, where software vendors like Bamboo Rose, E2open, Descartes, Infor and others are coming up with new ways to involve as many stakeholders in the process.

This is a broader trend that's taking place across both software sectors right now, where trends like remote work are forcing companies to bring together more people, processes and technology onto shared or integrated networks.

"[GTM] providers are offering to connect all of the different stakeholders," Sanchez Duran says, "and streamline the communication as well as improve collaboration between the different parties."

Breaking down silos

With the pace of change and disruptive events in global trade highlighting the need for technology that helps shippers increase resiliency, agility and compliance in supply chain operations, companies are turning to their software providers for help.

On the GTM front, Sanchez Duran says the biggest requests are for all-in-one solutions that allow organizations to digitize their operations, easily share information among both internal and external stakeholders and automate highly-manual processes that could be prone to human error.

Shippers also need help tackling global trade complexities that require a high level and/or attention or analysis, such as product classifications, simulation of landed costs, evaluation of free trade agreements (FTAs), documentation and requirements management.

Sanchez Duran says vendors are responding to these requests by offering products in a platform format, which allows companies to select the modules that they need while also maintaining integration between the components. In other words, companies can choose some or all of the offered modules while still being able to leverage good connectivity across the chosen components.

To help shippers better manage their global trade activities, vendors are incorporating expanded configuration options in their solutions, Sanchez Duran explains, plus capabilities like rule engines—and the already-mentioned AI and ML—to help improve their solutions' automation capabilities.

GTM providers are also partnering up with or acquiring other vendors with the goal of offering complementary and extended capabilities to their own customers. Despite these actions, Sanchez Duran said in a 2021 report that the GTM software market remains fragmented—a point of frustration for some software users.

"Integration of disjointed applications that support siloed processes," he points out, "is often one of the biggest complaints of GTM end users."

Shopping around?

Looking ahead, Sanchez Duran sees blockchain technology playing an increasing role in global trade in the near future. While not currently a trend or even something companies are requesting, he does say that blockchain "should bring further capabilities to digitize processes related to the use of international documents."

To companies that are shopping for a new GTM in 2022, Sanchez Duran says knowing your scope, requirements and priorities before exploring the option is very important. With this information in hand, you can ensure a better vendor evaluation process and more easily discern the top candidates from those with solutions that may not fulfill your organization's needs.

Sanchez Duran also cautions that there may not be a "one-size-fits-all" answer to your company's requirements.

"There are many different types of solutions in the GTM market with different focuses, so it's likely that one single solution might not be enough to cover all of those requirements," he continues. "Additionally, it's important to use a proper request for proposal process to evaluate vendors and understand their capabilities versus defaulting to one vendor because of its name or an [existing] relationship."

—Bridget McCrea is a contributing editor for Supply Chain Management Review

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