

SUPPLYCHAIN

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Transformation

In early November, I drove through Kankakee, Ill. on my way from Chicago to Milwaukee. On the east side of the Interstate, I saw a huge industrial facility that seemed to stretch on for a mile. My companion told me it was a 2 million square foot Amazon facility serving Chicagoland.

When we got ahead of the DC, I could see that there was another massive building behind it on the same property. That, my companion told me, was a U.S. Postal Service sortation center. Rather than load orders into the back of a parcel truck that would then drive to a parcel carrier's sort center, Amazon could now just toss orders across the parking lot. Maybe everyone's doing this, but to my eye, it was both innovative and another example of how Amazon is transforming its supply chain—and, forcing everyone else to try to keep up.

Transformation is a topic that comes up in almost every conversation I have with supply chain managers these days. Executives from companies as diverse as J&J Vision Care, the division of Johnson & Johnson that manufactures contact lenses, and Thrive Markets, a startup selling health and wellness products to its members, have talked about how they have had to remake their supply chains to meet new customer demands.

Transformation is also the theme of this issue of SCMR. It starts with our lead story from Southern Glazer's. Bobby Burg, Southern's Chief Supply Chain Officer, and Arun Kochar, a principal with A.T.

Kearney, write about Southern's embrace of automation, new distribution and logistics strategies and S&OP to create the largest—and they believe most responsive—wine and spirits supply chain in the United States.

Similarly, Irv Grossman, executive vice president of the global supply chain consultancy Chainalytics, and James Kilkelly, CEO of Apto Solutions, detail some of the new processes manufacturers of connected devices—including everyday appliances like refrigerators and coffee makers—must consider when disposing of products chock full of consumer data. And Maria Jesus Saenz, Rochak Gupta and Connor Makowski from MIT's Zaragoza Logistics Center in Zaragoza, Spain, explain the different approaches to horizontal collaboration, as well as the hurdles to making this innovative relationship work for your organization.

Rounding out the issue is research into the future of supply management from CAPS Research, and a timely article on cyber security from Alix Partners.

As you think about 2017, let us know about the transformations taking place in your supply chains. As always, I look forward to hearing from you with any comments or suggestions for future stories in SCMR.



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Southern Glazer's supply chain transformation did not happen overnight. Instead, it's been a series of steps over the past decade involving everything from automation to S&OP. This is how they did it.

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Horizontal collaboration is often easier said than done. A new study sheds light on the rewards of getting it right.

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In a world awash in cyber threats, partners and suppliers can be the vulnerable points that cyber criminals exploit to gain access to systems. Those challenges will get worse before they get better as supply networks become ever more complex. Here's a snapshot of the discussions you should be having right now.

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Predicting the future is a fool's game. But new findings from CAPS Research give a glimpse into how supply managers are preparing for tomorrow.

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Supply chain and logistics degree programs, certification programs and training are helping executives stay current on supply chain trends.

S62 2016 Virtual Conference: Streamlining Operations

Here's how to create dynamic, automated networks that offer seamless communication, improved collaborative third-party relationships, and can respond to changes at a moment's notice.

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Oil prices will rise eventually

I have long been encouraging a reduction of oil consumption in global supply chains. While I think that oil will be readily available into the foreseeable future, its price will rise as both demand and extraction costs increase over time.



Dr. Lapidé has extensive experience in the industry as a practitioner, consultant, and software analyst. He is currently a lecturer at the University of Massachusetts' Boston Campus and is an MIT Research Affiliate. He received the inaugural *Lifetime Achievement & Planning Award* from the Institute of Business Forecasting & Planning. He welcomes comments on his columns at llapide@mit.edu.

This column represents my annual update on oil and the supply chain. I am dedicating it to the memory of Jay W. Forrester who passed away in November. Some managers will know who he was and what he accomplished regarding supply chain management. For others, they should think of the educational “beer game” that they have most likely played. It simulates how a lack of downstream and upstream information causes excess and volatile inventories to be held by trading partners all along a supply chain. Second, regarding oil he was the father of System

Dynamics that dealt with using simulation to understand big systems, such as the impact of CO2 emissions on the global environment.

The passing of a thought leader

According to Wikipedia, Forrester was a “pioneering American computer engineer and systems scientist. He was a professor at the MIT Sloan School of Management. Forrester is known as the founder of system dynamics, which deals with the simulation of interactions between objects in dynamic systems.” In 1961, “arising from a project with General Electric, he wrote about the expanding effects down the supply chains due to fluctuations in demand, thenceforth known as the ‘Forrester effect’ or bullwhip effect.” This is the effect that many of us first learned about by playing the “beer game.”

Forrester expanded his purview to urban issues and in 1969 wrote a book, “Urban Dynamics,” which sparked an ongoing debate on the feasibility of modeling broader social problems. He later met with the Club of Rome to discuss issues surrounding global sustainability and published “World Dynamics,” which “took on modeling the complex interactions of the world economy, population and ecology, which was controversial.” This book, published in 1971, along with “Limits to Growth,” which was published the following year by Club members, portended a few

scary future scenarios involving limited resources to support an unlimited growth in the world’s population. Both started the field of global modeling and led to the models we read about today simulating climate changes and supporting the need to limit CO2 emissions by reducing the use of carbon-based energy. Hence, Forrester’s relevance to this oil update.

Update on oil pricing

I’ve been espousing a reduction of oil consumption in global supply chains over my 10-year “Insights” tenure. The basis of my view is that oil will be readily available into the foreseeable future, however, its price will rise as both demand and extrac-

Some supplying countries and companies are starting to consider future scenarios in which global demand for oil peaks starting anywhere from 2020 to 2040.

tion costs increase over time. As shown in Figure 1—showing the real (deflated) price of oil from 1974—there was a “cheap oil era” from the late 1980s until late 2004 in which prices bounced around from \$20 to \$30 a barrel. From then on oil prices rapidly rose to around \$100/barrel. Since 2015, however, prices have dropped to around half that level or less, portending a “cheaper price era,” still double the pricing during the cheap oil era. The drop was the result of both reduced global

demand from depressed economies following the Great Recession, and a surplus of oil as U.S. fracking operations came on-line with great abandon.

Business news in 2016 has discussed the facts that the oil and gas shale sector continues to reduce their production, while U.S. stockpiles are still increasing at close to record levels. Some supplying countries and companies are starting to consider future scenarios in which global demand for oil peaks starting anywhere from 2020 to 2040. This is leading them to start to shift their strategic focus from largely fuel supply to petrochemicals (that are used, for example, to make plastics and other oil-based materials that are used to manufacture products). Thus, in the short term, while most suppliers are focusing on cheaper oil lasting for some time, they now recognize that global demand might peak in the foreseeable future.

Oil prices will rise again

I still believe that oil prices will rise naturally and be more volatile in the long run. Oil's CO₂ emissions have given it a "dirty name," and eventually it will no longer be the energy source de jour. It will follow the path of coal as both are first replaced by natural gas, and then over time by other energy sources, such as wind and solar.

The wild card that will speed up price increases comes from the biggest news in 2016. At the Paris climate conference (COP21) in December 2015, 195 countries adopted the first, legal global climate deal. In 2016 many ratified their intent to comply. The deal included the need for global emissions to peak as soon as possible. This means that peak oil will come sooner than expected because the treaty binds countries to getting past peak emissions as soon as possible.

Eventually this might require governments to levy some type of externality fees for the use of oil in order to discourage its use, and to pay for remediation of the

negative effects carbon-based emissions have had on mankind, and our environment. According to Wikipedia: "In economics, an externality is the cost or benefit that affects a party who did not choose to incur that cost or benefit. Economists often urge governments to adopt poli-

cies that 'internalize' an externality, so that costs and benefits will affect mainly parties who choose to incur them."

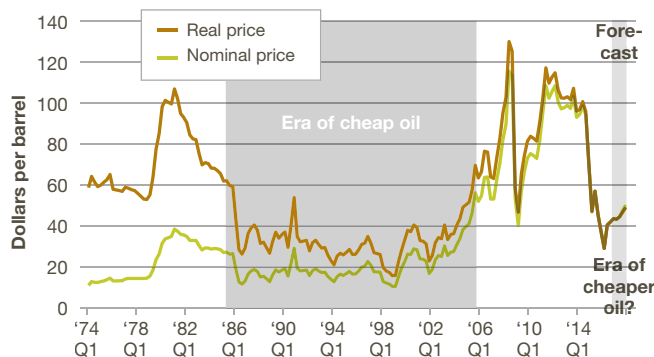
Vast quantities of oil have been historically consumed without any of these levies. Expect the price of oil to rise even faster as some type of levies might affect oil prices in the foreseeable future. This will be a problem for supply

chain managers because most of our consumption of oil lies in transport operations that need carbon-based liquid fuels, and these cause high-levels of CO₂ emissions. Solar and wind energy sources are not feasible replacements to oil. The switch to natural gas is decades away because a whole new natural gas supply chain will be required. In summary: Over the long-haul stay the course and continue squeezing oil out of your supply chains.

Author's note: I wrote about Systems Dynamics in "Is it Possible to Have Predictive Metrics?" an "Insights" column published in SCMR November 2009, as an example of a method for taking historical quantitative metrics, and rendering them predictive by creating simulation models for understanding the future. "The models identify all of the "causal factors" that directly or indirectly affect performance metrics over time and "causal loop diagrams" are developed to get an understanding of the structure and dynamics of a complex supply chain," I wrote at the time. "These diagrams depict how each factor positively or negatively affects the metric, as well as other factors identified. The causal factors in the diagram become the predictive metrics for performance metrics, because any change in them propagates over time in a simulation to affect them. ☺☺

FIGURE 1

Quarterly imported crude oil price



Source: EIA Short-Term Energy Outlook, November 2016

Developing a clearer picture of supply chain transparency

As the foodservice industry meets growing demand for more product information, there are real opportunities for companies that take a leadership position.

By Alexis Bateman, Holly Cundieff and Mark Ohlund

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Improving supply chain transparency is a high priority for companies, especially in industries such as foodservice where consumers and regulators are pushing for more publicly available information on how products are made and delivered. Increasing product complexity—the growing demand for organic and gluten-free foods, for example—as well as food safety and security concerns, continues to drive the demand for more transparency.

Responding to these demands is not easy. The fragmented nature of the supply chain can make it difficult to achieve the kind of consensus that is needed to create efficient, end-to-end monitoring systems. However, as the industry responds to the need for more transparency, there is a huge opportunity to take a leadership position. Key to developing the level of transparency that is now expected is changing the behavior of stakeholders and harnessing the power of data visualization technology to present abundant data in easily understood and actionable formats. With these changes in place, the industry can open the way to innovations that could take supply chain performance to a new level. And, the journey provides some valuable lessons for other industries that are striving to meet market demand for increased supply chain transparency.

Data disjoints

The foodservice supply chain is extremely complicated. The companies in this industry sell food that is prepared and served in venues outside the home (the most familiar outlet is restaurants). A complex supply chain that stretches from agricultural growers across the globe to end consumers supports each restaurant. The supply chain also includes manufacturers, freight carriers, forward warehouses, distribution centers (DCs) and third-party logistics providers (3PLs). Many

of these players tend to operate in silos that can impede the end-to-end flow of information.

Data latency is one of the most difficult hurdles. For example, some trading partners share daily inventory and sales information in single, large batches; by the time data is uploaded into supply chain visibility tools, it may be too old in “food time.”

The veracity of data is another challenge. There are many reasons why inaccuracies creep into supply chain data streams. An overarching problem is a lack of widely adopted, consistent standards for exchanging data. There are also various operational issues to contend with. An example is the reuse of product numbers and warehouse identifiers without alerting trading partners to such changes. The inconsistent use of lot codes is another issue. Ideally, a lot code is generated by a supplier and follows the product to final delivery. Sometimes an entity generates its own lot code and discards the original one, making it difficult to track the chain of custody of a product. An even bigger hurdle is the inability of trading partners to systematically capture, track and report supplier-generated lot codes.

Untimely or inaccurate data is always an issue, but particularly in today’s highly variable consumer environment. Demand for food products can be unusually volatile because shifting consumer preferences influences it. Some peaks in demand—for example, when a restaurant dish suddenly

becomes popular because a celebrity tweets about it—are almost impossible to anticipate.

The industry fragmentation described above compounds such problems. In a fragmented environment, trading partners tend to optimize locally. For example, a DC might build safety stock of a critical product for a favored restaurant chain that is not visible to other players. Unseen inventories scattered across a supply chain cause significant inefficiencies. Add the dramatic increase in the volume of data to the mix, and it becomes clear that operational models have opportunities to improve before the industry can deliver the levels of supply chain transparency that are expected in today's world. These changes are within reach—and many are being implemented.

Tying technology to behavior

One of the first steps to overcoming these problems is to change the behaviors that cause data errors and latency.

For example, Armada, a Pittsburgh-based fourth-party logistics provider (4PL) to the foodservice and retail industries, is working with DCs and other entities to make sure that the inventory and shipment data they provide is as near to real-time as possible. This does not require them to make big investments in technology; huge improvements are possible by simply rethinking the way data is managed and shared. It's also important to break down operational silos, and eliminate the practice of optimizing locally.

Changing stakeholder behavior lays the foundation for the new technology that drives greater supply chain transparency. At Armada, this emerging technological base has two key elements. First, an integrated platform allows the company to receive data in multiple formats such as EDI. This information backbone is available to every enterprise application—including warehouse management and transportation management systems—accessed by designated stakeholders.

Second, Armada is working to fundamentally change the way this data is stored and accessed for clients and their network stakeholders. For example, the practice of generating reports from data stored on applications is no longer sufficient. Data warehousing and extraction as well as business intelligence capabilities are being built to support the high-volume information management systems that are now needed.

This is not cutting edge—but harnessing these capabilities to develop tailored visual displays of complex data represents new territory for foodservice supply chain practitioners.

Traditional methods of displaying and analyzing

operational data through columns and rows aren't enough if the goal is to redefine supply chain transparency. In addition, practitioners need faster, more effective ways to consume and use the large volumes of data now available. And it is likely that the flood of data will increase over the next few years. Importantly, much of this data needs to be configured for mobile technology platforms that are growing in importance.

An example of an innovative display format is an “items at risk” dashboard that shows when items in specific DCs are reaching stock-out levels based on lead times. Managers no longer must pore over rows of numbers to get this information; they can quickly review the screen and see the items that are at risk. Moreover, the information that managers need to take remedial action is displayed, such as contact details of DCs that can supply the flagged items. Another application, “loads at risk,” uses truck GPS information cross referenced with supply chain inventory across the network to identify shortages and potential spoilage. The next generation of these capabilities will cross-pollinate the information from such applications.

Managing by exception

These are exciting innovations for the foodservice industry, but it's only the beginning. For instance, there is huge potential for developing more advanced analytics. At present, we can look at historical data and figure out what caused problems such as missed sales targets in the recent past. And we analyze trends and operational data such as weather patterns to anticipate what issues might lay ahead. The ultimate analytical goal: to develop systems that automatically identify potential problems and trigger remedial action.

Consider a case where the “items at risk” screen shows that an item nearing an out-of-stock situation. The system automatically initiates a transfer order from a DC that it identified as a source of additional stock. The DC is notified and the order approved without unwieldy manual procedures. And, the system issues alerts and updates via mobile devices.

More innovation

Delivering a higher level of supply chain transparency in response to consumer concerns and more stringent regulation is easier said than done. The good news is that once you start on this path, new opportunities for raising supply chain performance open up. Technology advances—notably the development of increasingly sophisticated analytics—will drive more innovation and provide further impetus for change. ☺☺

Embracing climate change solutions

At this time last year, we examined the worsening conditions in global supply chains brought about by dramatic shifts in climate patterns. Industry analysts maintain that it's not too late to reverse the trend.



When BSR (Business for Social Responsibility) convened its annual conference in San Francisco in 2015, there was considerable celebration about the landmark agreement at COP21—also known as the Paris Climate Conference. It meant that for the first time in over 21 years of UN negotiations, standards were finally established to achieve a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C.

Patrick Burnson is the executive editor at *Supply Chain Management Review*. He welcomes comments on his columns at pburnson@peerlessmedia.com

When BSR met in New York last November, the *cri de Coeur* was for “bold climate action,” with analysts observing at the time that multinationals must raise their ambitions by investing in climate finance, transitioning to renewable energy and finding more innovative ways of ensuring resilient supply chains.

It’s challenging to change organizational culture to embrace clean energy and other climate solutions, BSR analysts admit. But they insist that supply chain managers join Corporate Social Responsibility (CSR) managers in becoming “intrapreneurs” charged with persuading a wide variety of stakeholders that climate-focused initiatives are in their best interest.

Effective communication of both material risks and opportunities is key to overcoming barriers such as capital constraints, management attention and lack of in-house expertise, BSR adds. A strong messaging strategy, however, can make the task less daunting.

Seizing leadership

Kevin O’Marah, Chief Content Officer for the consultancy SCM World, came to a similar conclusion last fall. Indeed, one of his major briefings aimed to alert and inspire supply chain managers to become “climate change leaders.”

This call to action, he says, goes out to supply chain leaders because they’re the ones who can tackle this without waiting for government to act. Furthermore, he notes, what gets measured gets managed:

Supply chain people love metrics. We’ve been pounding away at inventory turns, utilization rates and on-time delivery for decades to great effect. Isn’t it about time we start measuring and managing our environmental impact, and in particular, operations’ contribution to atmospheric carbon?

O’Marah observes that supply chain executives are the ones ultimately driving all raw material extraction, all mechanical, chemical or thermal conversion in manufacturing, and all packaging and delivery from source to end consumer. This applies to food, clothing, medicine and machinery as well as the human infrastructure in our towns and cities.

To be blunt, he adds that up until now



supply chain managers have been quick to cut down the trees, cook the chemicals, weld the steel and dispatch the trucks that emit much of the carbon causing global warming.

But he also feels that a new awareness is bringing about change. Last year, 54% of 1,018 supply chain professionals surveyed by SCM World said that they believed their supply chains played a “substantial role in ensuring long-term environmental sustainability.” Of the remainder, nearly all agreed that their supply chains played a “limited but meaningful role” in tackling sustainability.

Among 161 respondents from the consumer packaged goods industry for instance, 98 said their supply chain impact was “substantial,” while 60 called their impact “limited but meaningful.” More significantly, only three claimed “none.”

“We seem to understand what’s happening,” O’Marah concludes.

Call to arms

Supply chain managers have also shown a readiness to attack sustainability challenges with goals that do much more than simply raise awareness. Unilever, for example, intends to achieve 100% elimination of non-hazardous waste to landfill, while IKEA’s “Better Cotton Initiative” seeks to establish 100% sourced cotton. For the Coca-Cola Company, the goal is to have water replenishment in 100% of its bottling operations

All these companies—and several others, says

O’Marah—are “taking it to the limit.”

Efforts by Kellogg’s, Land O’Lakes, Nestlé and General Mills are typical of the food enterprises leading all industries, with 77% saying their supply chain plays a substantial role in securing the future of the planet.

According to O’Marah, this may be because food and beverage companies “feel the pinch” of a fraying ecosystem upstream in agriculture, and also downstream with consumers tilting away from industrial-era “big food.”

He maintains that the unique challenge now is to articulate the earth impact of products sold to consumers who increasingly believe their shopping decisions can make a difference. Part of the challenge is to avoid being perceived as “greenwashing” by consumers who may perceive a marketing spin on labels:

Why not take a stand and call out carbon openly and consistently? I know that precise carbon calculation at an item level is impossible, but can’t we offer estimates? The main promise need not be perfect accuracy but a commitment to continuous improvement. Because most consumer food purchases happen very regularly, we could in essence partner with the shopper to save the planet.

The SCM survey suggests that other industries are less suited to meet this challenge, though, with only occasional (automotive) or non-existent (chemicals) contact with consumers. O’Marah adds that some also clearly have other imperatives (pharmaceuticals) or have genuinely small carbon footprints (media).

BSR and SCM World agree that carbon and climate change may only be one thread of the broader social and environmental sustainability problem, but supply chain managers can—and must—play a major leadership role in addressing the alarming consequences of aberrant global weather conditions. ☺☺

HOW THEY DID IT:

Southern Glazer's

Wine and Spirits Supply Chain Transformation

BY BOBBY BURG AND ARUN KOCHAR

Southern Glazer's supply chain transformation did not happen overnight. Instead, it's been a series of steps over the past decade involving everything from automation to S&OP. This is how they did it.

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On January 11, 2016, Southern Wine and Spirits agreed to merge with Glazer's Wine and Spirits and create the largest distributor of wine and spirits in North America. The new company, Southern Glazer's Wine and Spirits, LLC, or Southern Glazer's, represents more than 2,400 suppliers of wine, spirits, beer and beverages, including more than 5,000 individual brands. The company makes weekly deliveries to approximately 200,000 customers in 44 states, and distributes more than 150 million cases a year to a customer base that ranges from big box retailers and national grocery chains to hotels, retail outlets, and neighborhood restaurants, bars and clubs.

That same month, Bacardi, the world's largest privately held spirits company, announced that it had selected the newly-formed company to lead the distribution of its wine and spirits portfolio in more than 40 markets across the United States and Canada.

It could be argued that the latter could not have happened without the former: Prior to the merger, it's doubtful that Southern—or any other single player in the North American wine and spirits industry—would have had the scale and logistics capabilities to create the kind of distribution network Bacardi was looking for.

Indeed, both deals could be viewed as the culmination of Southern's nearly two decade-long journey to extend its reach and achieve supply chain excellence. Traditionally, the wine and spirits industry has been viewed as a supply chain laggard as compared to industries like CPG, retail and food and beverage. But as a distributor for whom best-in-class transportation and distribution processes and customer service are a competitive differentiator, Southern has remade its model around five basic objectives:

- lead a bold transformation that delivers breakthrough service performance;
- redefine the model for managing the flow of inbound product from suppliers;
- embed leading distribution practices from other industries where applicable;
- enable the flexible management of sales and inventory growth; and
- deliver a differentiated supplier value proposition that delivers a competitive advantage.

It did so by focusing on five key strategies: The first was a series of mergers and acquisitions to grow its footprint; the second was the hiring of talent and supply chain professionals from outside the industry; the third was to optimize its growing distribution network and adopt automated materials handling technologies inside its remaining DCs; the fourth was a new distribution model for slow moving products and products that are produced and ordered in small quantities; and finally through the implementation of supply chain processes such as sales and operations planning (S&OP) and collaboration. This is how they did it.

Drivers of the supply chain transformation

Over the last 10 years, the wine and spirits industry has been in the midst of a transformation. As the regulatory environment has evolved, small, local and regional distributors like Southern and Glazer's have

merged into new entities with scale. Twenty years ago, there were close to 1,000 wholesalers/distributors; today there are close to 400 and the top five dominate 50% of their markets.



These new distributors are in the process of remaking their networks and their distribution capabilities. Small, conventional facilities that serviced local areas are being replaced by larger buildings that can serve a region with next-day deliveries. Inside, those facilities are moving from conventional paper-based operations to highly-automated processes utilizing voice- and light-directed picking, high speed conveyor and sortation systems and automated storage technologies. More importantly, these distributors are adopting broader supply chain strategies (such as S&OP and integrated business planning) to launch new products, optimize deliveries and get the right products to their customers shelves.

Southern Wine & Spirits was a leader on both fronts for years before its merger with Glazer's. Since its founding in Miami in 1968, Southern grew through acquisitions and green-field expansions into the country's largest wine and spirits distributor. In 1969, just one year after its founding, Southern expanded into California and by 1972 it had statewide distribution in Florida. The next 30 years saw further expansion in California while gaining footholds in Arizona, South Carolina, Pennsylvania, Hawaii, Kentucky, New Mexico and Colorado. By 1992, Southern had ascended to become the largest wine and spirits wholesaler in the United States. By 2010, following a five-year period of exceptionally fast growth, Southern had grown its footprint to more than 30 states.

Just as Southern was transforming its business, mergers and acquisitions were also underway among its competitors and suppliers, as companies like Bacardi and Diageo consolidated wine, spirits and beer producers from around the globe. The customer

base has also changed. At the retail level, for instance, local grocery chains have expanded into regional and national players that look for suppliers who can serve them wherever they do business. At the same time, a distributor must also be able to meet the needs of small customers, like the neighborhood bar or the restaurant that specializes in boutique wines and craft spirits.

In the midst of this growth, Southern's CEO Wayne

company built by acquiring competitors in regions where it didn't have a presence, Southern essentially operated like 10 different companies, each with its own legacy approach to running its operations. If the company was going to stay on a growth path, it needed to standardize processes and procedures and operate as one company across functional silos—including training and supply chain.

Southern Glazer's at a glance

- 22,000 employees
- Operations in 44 states plus the District of Columbia, the Caribbean and Canada
- 47 distribution centers
- 6.4 million customer deliveries annually
- 12.5 million square feet of warehouse space
- Delivers to more than 250,000 customers annually
- Represents 1,500 wine, spirits, beer and beverage suppliers
- Distributes over 5,000 brands

Chaplin outlined a vision for the company to become a national player. His strategy sounds simple: align with a strategic set of suppliers and offer them incentives to work with Southern. The challenge from a supply chain perspective was to create a distribution network and processes that could execute on that vision.

Making it happen: The people factor

Human resources is not traditionally thought of as a supply chain function. Yet, as the current focus on the supply chain talent gap has made clear, an organization can't manage a best-in-class supply chain without the best people. Despite the current focus, the search for top notch supply chain talent is not a new phenomenon. In the early 2000s, Southern recognized the need to dedicate resources to employee engagement, retention and targeted recruitment. One of the drivers for this focus was Southern's aggressive merger and acquisition strategy. As an entrepreneurial

The first step was to hire a senior vice president of human resources who was charged with centralizing and standardizing human resource policies and practices across the company. That was followed by a new corporate level position of vice president of organizational development whose job was to develop standardized training programs, performance appraisals and succession planning across the company. In both instances, the new positions were developed to instill employee engagement that would deliver a competitive edge in a changing industry. Perhaps most important, the establishment of standardized practices and processes across the company laid the groundwork for Bobby Burg, Southern's chief supply chain officer, to develop standard supply chain processes that could be rolled out across an integrated national distribution network rather than a series of independent, regional supply chains.

To that end, Southern began to look outside the wine and spirits industry for talent that might bring in best practices from other disciplines. One example was the recruitment in 2013 of an executive from the U.S. Treasury to fill the role of director of business continuity. This new hire reports to Burg and is responsible for providing leadership for the key program areas of business continuity, disaster recovery, risk management, cyber security and customer service. Another new hire was the vice president of supply chain transformation who joined Southern after five years at GE, including a stint as the sourcing manager for GE Digital Energy for North America and Europe.

The ABCs of DCs

Just as the establishment of a central human resources function brought 10 independent operating companies

under one umbrella, the supply chain team launched an initiative in 2002 to redesign and optimize the distribution network, a project that continues today. The effort began in Illinois, following the acquisition of two wholesalers. As part of that deal, Southern inherited nine small distribution centers. To consolidate the network, Southern built a new highly-automated 600,000 square foot facility that included 425,000 square feet of warehousing and distribution space and a high-speed conveyor and sortation system capable of shipping 10 million cases a year.

A similar effort was launched in Florida a few years later. At the time, Southern served the state with five distribution centers. In their place, it opened one state-of-the-art distribution center in Lakeland, Fla., that made innovative use of automation technology to serve the whole state. The central DC was augmented by eight, small cross-dock depots that received full truckloads and sent out route trucks for final delivery. With those two projects under its belt, Southern consolidated and redesigned distribution centers in the other regions where it does business. In recent years, the company has invested over \$200 million to consolidate, retire or renovate 2.5 million square feet of warehouse space, with plans to address another 1 million square feet of space over the next 24 months. The strategy, according to Burg, is to replace small-cube buildings with high-volume, high-capacity and high-cube warehouses that make smart uses of automation and technology. These large DCs serve route delivery trucks that make next day deliveries of cases to customers as well as full truckloads that, as in the Florida model, deliver pallets to a network of cross-docks depots in strategic locations, extending the reach of the regional DCs.

One example of Southern's distribution strategy is the 334,000 square foot distribution center in Union City, Calif. Reaching 55 feet high, the facility features a high-speed conveyor and sortation system and an automated storage and retrieval system that manages the 4,500 fastest moving SKUs that represent 82% of the volume in the facility. The AS/RS is used not only for storage, but also automatically replenishes some 1,500 case pick locations. Meanwhile, voice-directed picking is utilized in a bottle pick area where mixed cases are

built. Operations across the facility are tied together by a sophisticated warehouse execution software system. All told, the facility can process as many as 50,000 cases a day.

The facility takes orders from customers for next day delivery throughout the day. Order picking begins in the early evening. Full and mixed cases accumulate on the conveyor system until it's time to load the trucks. The software system then releases them into route trucks on a first in/last out basis in the order they will be delivered to customers. Route delivery trucks begin leaving the facility early in the morning. Meanwhile, full truck loads carrying pallets travel to a cross-dock depot in the northwestern part of the state. There cases are loaded onto a conveyor system that builds route stop deliveries for that part of the state, or sends pallets into another truck for deliveries to Washington State. Cross-dock facilities like this one also serve as sales offices and "stores" where retailers can pick up their own orders.

By consolidating inventories in large regional DCs like the one in Union City, Southern has developed the flexibility to respond to customer and consumer demand, rebalance inventory levels through the supply chain, ensure improved in-stock positions and consolidate and leverage inbound and outbound shipments. Southern continues to expand the automation and technology tools in its kit, implementing a new automated case handling technology in one of its New York facilities and piloting new pick and load process with the potential to reap major savings at other locations. Beyond that, automation technologies enable Southern to keep pace with the anticipated growth in its business: Even before the merger with Glazer's, the distributor predicted that without changes to its model slow moving SKUs would represent some 62% of total inventory by 2021 and

Southern continues to expand the automation and technology tools in its kit, implementing a new automated case handling technology in one of its New York facilities and piloting new pick and load process with the potential to reap major savings at other locations.

that without new technologies, all but two DCs would exceed full capacity.

Consolidating slow movers

With a highly-automated distribution network in place, Southern introduced a new concept to the wine and spirits industry as a way to address the increase in new

After several months of planning, the team was ready to roll out S&OP. The success of the initiative would depend on the Southern team adopting a unified way of working, enabled by strategic communications and careful modification of business processes and supporting systems.

products bottled in small lots and slow moving products while engaging its supplier partners in an innovative, synergistic, cost-savings solution: The Southern Supply Center (SSC).

Opened in Tracy, Calif. in July 2013, and managed by a 3PL, the 167,000 square foot facility consolidates wine and spirits from global partners that are produced or ordered in small quantities, warehouses them until there is demand and then redistributes them to Southern DC's across the country. The Tracy location is in the heart of California's wine country, which puts it in easy

shipping distance for producers of high-end wines. Southern's Burg describes it as "the first dramatic change on the operational supply side of the industry since Prohibition."

Prior to the SSC, suppliers of these products shipped directly to a Southern DC, often shipping out a large number of small orders, or low-density transportation lanes. As an example, a tequila maker used to bring its product from Mexico to a warehouse it operated in Nevada, where it then shipped product to Southern's regional DCs across the United States.

The SSC turns that model on its head. Rather than ship out a number of small orders, producers can ship one large order to the SSC. That tequila maker, for instance, now ships tequila directly from Mexico to the

SSC. Southern, meanwhile, streamlines distribution by aggregating demand from across the network into the SSC, which enables better purchasing decisions and drives transportation efficiencies. For instance, a DC in Kentucky couldn't afford to purchase and warehouse a whole container of top shelf wines from Italy that might not sell through for a year or more. Now, the supply chain team can buy a whole container for the SSC, taking advantage of the container price while leveraging sea lanes. It then creates a mixed pallet of product that includes a case of Italian wine that is shipped to that Kentucky DC.

Suppliers that buy into the new model also benefit by partnering with Southern on sales forecasts and from the company's market intelligence. What's more, suppliers now have easy access to the entire Southern Glazer's supply chain network. The new product flow delivers at least three benefits to Southern and its suppliers:

- aggregated forecasting process reduces safety stock requirements;
- suppliers' bottling operations are streamlined through fewer, larger quantity, predictable orders; and
- Southern benefits from a high number of high-density transportation lanes.

Customers also benefit. Southern is able to offer a more distinctive product mix and improved service to small local wine shops and top flight restaurants. And with the California SSC operational, Southern has plans for additional SSCs in the Midwest and on the East Coast.

Enterprise S&OP

On August 26, 2014, the leaders of Southern's finance, IT and strategy functions gathered their reports in one large meeting room to introduce a new idea: sales and operations planning, or S&OP. This change was a fundamental—but critical—shift in the way formerly siloed departments would operate. Inventory, after all, is the lifeblood of a distributor like Southern; with an average of \$3 billion sitting on the

shelves of warehouses and outside storage, it is also the biggest item on the company's balance sheet, outstripping every other expense. A successful S&OP program could not only improve fill rates and minimize out of stock positions, but any reduction in inventory levels and outside storage costs would free up valuable working capital that could be reinvested in other processes.

After several months of planning, the team was ready to roll out S&OP. The success of the initiative would depend on the Southern team adopting a unified way of working, enabled by strategic communications and careful modification of business processes and supporting systems. The process became the foundation of "One Southern," an internal change management strategy that underscores the importance of one single set of best practices.

In the industry, suppliers are often persuaded to align with a given distributor when convinced that their brands will gain more visibility or other benefits. But even the most friendly honeymoon can end quickly if the distributor is not carrying the right quantities and out-of-stocks are frequent. At Southern, S&OP is regarded as the nexus of the commercial and the supply chain sides of the business. It is also vital for Southern to realize CEO Wayne Chaplin's vision for supplier alignment.

S&OP pushed Southern team members to work in a more cross-functional manner than they had in the past. Its success could engender other significant enterprise initiatives. Since its adoption, the S&OP process has helped Southern drive better supplier collaboration, increased fill rates and improved material availability.

Next steps

With a redesigned and optimized network and new processes such as S&OP in place, Southern has focused on collaborating more closely with its

largest suppliers, a process it refers to as value chain integration.

An initiative with one large supplier, which yielded \$9 million in savings in the first year, focused on freight co-sourcing; collaborative sales planning aimed at generating a single "demand signal;" utilization of the SCC to optimize the flow of the slow-moving products that represented about 10% of that supplier's business; and simplification of business processes, including the automation of the procure-to-pay process.

The two organizations also instituted monthly meetings to develop one unified purchasing forecast, which has resulted in a 10-day reduction in finished goods inventory, a drop in overtime for warehouse employees and 50% reduction in the volume of expedited freight. In the next phase, the two will develop processes for the joint procurement of non-freight categories such as bottling, warehousing and delivery and marketing.

A second example launched with a spirits producer was designed to jointly capture as much as \$5 million in benefits through operational efficiencies, a new procurement strategy and integrated planning. The two organiza-

tions meet twice a month for integrated planning meetings focused on internal alignment and joint shipment planning. They are also sharing forecasts, performance measurements and supply and production planning. And, they are also utilizing the SSC to drive efficiencies.

Now, with the merger with Glazer's and the distribution agreement with Bacardi, Southern Glazer's will continue to improve its network, the processes inside the four walls of its distribution centers and the way it collaborates with suppliers and customers. After all, in an ever-changing business, transformations are never complete and the best companies will always find ways to improve. ∞



Horizontal collaboration is often easier said than done. A new study sheds light on the rewards of getting it right.

Finding Profit in Horizontal Collaboration

BY MARIA JESUS SAENZ, ROCHAK GUPTA AND CONNOR MAKOWSKI

Horizontal collaboration—or the process of two or more companies cooperating at the same level on a certain market activity to realize benefits they could not achieve independently—is difficult to accomplish but hugely rewarding for those companies that do it successfully.

While horizontal collaboration (HC) can encompass a number of supply chain processes, freight transportation is one activity that offers vast potential for a profitable partnership. Take Carreras, a private, mid-sized logistics provider in Spain that is actively pursuing HC relationships to help it sustain or improve its 7% annual growth rate. “Horizontal collaboration has allowed us to expand our network and increase efficiencies without costing us significant extra effort or capital,” says Fernando Bermudez, Carreras’ director of operations.

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While Carerras is one of many companies around the world that are unlocking the value of HC in transportation, they represent a fraction of the shippers and logistics companies* that could be capitalizing on the strategy. To help more enterprises capture the benefits, a research team at the Zaragoza Logistics Center (ZLC) in Zaragoza, Spain, has developed a framework for creating effective HC projects. Based on current success factors as well as new business models, tools and practices, the framework paves the way for the wider adoption of horizontal collaboration (see About our research).

HC gains

Horizontal collaboration typically occurs between two or more manufacturers, two shippers or two logistics service providers (LSPs). It can take place between companies at the same level within a particular supply chain, such as two manufacturers in the same industry, or between companies in different value chains, such as two manufacturers in different industries.

There are a number of drivers of horizontal collaboration, ranging from the demands of globalization to a marketing advantage (Figure 1). The strategy can generate significant cost savings, increase service levels and reduce carbon footprints simultaneously. For example, a study of fast-moving consumer goods distribution networks in Belgium conducted by the European project CO3 (co3-project.eu)

* For the purposes of this article, shippers are companies that purchase logistics services from other companies on a given route, and logistics companies sell logistics services to other companies on given routes.

found that the deployment of HC strategies can cut logistics costs by up to 39% and CO2 emissions by 38%. That level of savings typically has a direct impact on profits. Similarly, Kellogg's and Kimberly-Clark recently reduced transportation costs by 7% and saved 30,000 gallons of diesel in a single year as a result of a HC initiative in Europe.

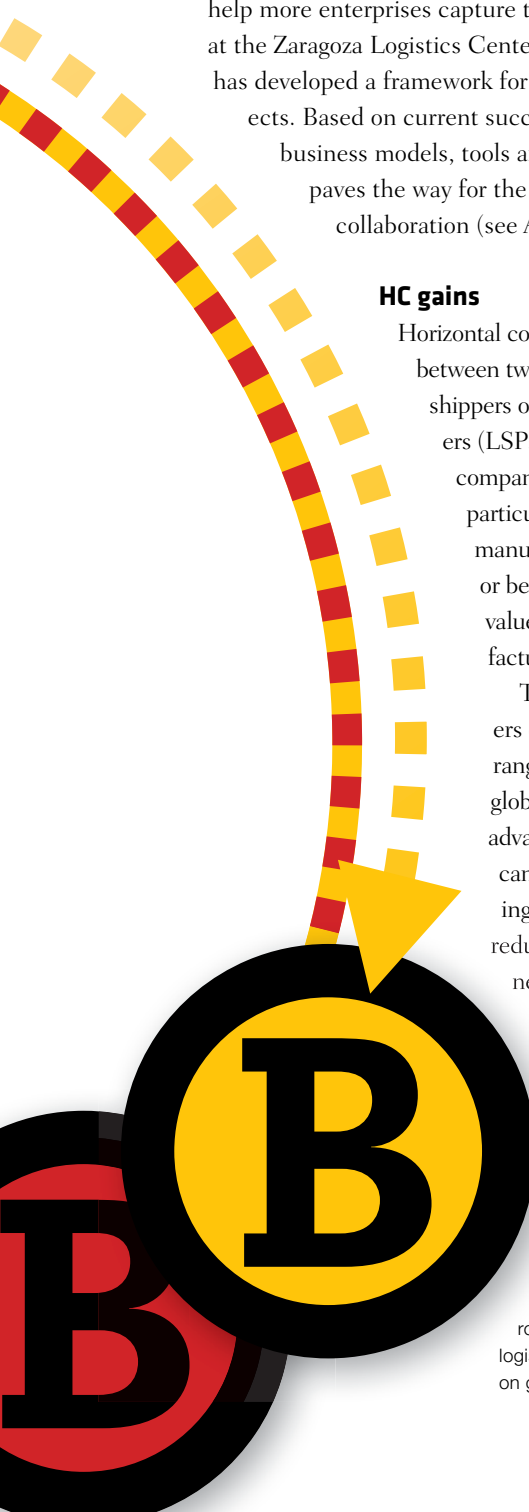
HC speed bumps

How does HC achieve such gains in the freight transportation space? In general, most of the value is created by lowering costs through the more effective utilization of transportation fleet assets.

More specifically, the strategy generates surplus value in a supply chain by optimizing capacities (weight-volume balance) and asset utilization rates. This is typically done through the active synchronization of load schedules and the reduction of empty miles, which lead to more efficient transportation and less variable load dispatches.

Despite these potential gains, HC adoption is not widely practiced, for a number of reasons (Figure 2). These include human fallibilities—primarily a lack of trust, and a fear of both failure and the effort required to implement new ideas—as well as operational difficulties. In addition, organizational barriers often get in the way; in some organizations the barriers are so high that this level of collaboration can't even take place internally between divisions.

The MIT-ZLC framework helps companies to overcome these speed bumps to effective HC. The research project that created the framework analyzed relevant differences between the United States and Europe. The researchers also identified horizontal collaborations in key sectors, documented how successful projects form and grow, identified key factors for improving HC outcomes and developed tools that can better facilitate future HC projects.



Current experience

The MIT-ZLC researchers found that companies in different sectors around the world have paired with each other to achieve new supply chain efficiencies. What’s more, these alliances come in many shapes and sizes.

Consider, for example, the collaboration between Ford and GM dealers in the United States (see Figure 3). Schneider Logistics

their parts networks and schedule orders.

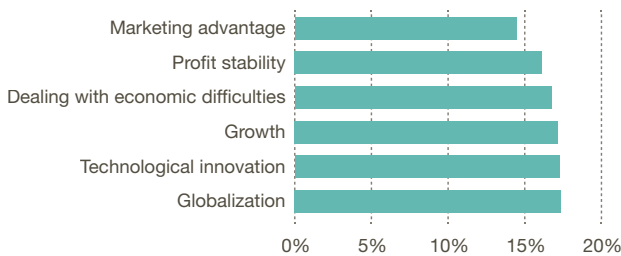
The sharing of compatible route schedules is another variation on the HC theme. Land O’ Lakes, one of America’s premier food companies, used to ship a number of empty trailers along the eastern seaboard. Working with Nistevo.com, an online logistics match-maker that is now part of IBM, it was able to partner with other companies with similar transportation schedules. On one specific route, General Mills was sending its products from point A to point B on a similar schedule as Land O’ Lakes was sending its products from point B to point A. Both were deadheading back with empty trailers. The two companies were able to synchronize loads and reduce empty miles. Through partnerships like this one, Land O’ Lakes’ was able to save over \$2 million a year.

Carreras, the Spanish 3PL mentioned earlier, launched a campaign to collaborate with localized 3PLs in an effort to reduce the total miles driven in its operations. Carreras typically looks for logistics companies that service small regions relatively far from its distribution centers. A collaborative agreement with these logistics providers allows Carreras to achieve a more efficient network. The company has established a framework for starting new horizontal collaborations that has enabled it to shorten the time it takes to set up partnerships from over two months to just a couple of weeks. In addition, the more detailed expedited process uses standardized contracts and improves Carreras’ ability to identify the needs of prospective partners. As a result, the company leverages efficiencies from a network that is more dynamic and expansive.

Kimberly-Clark has collaborated horizontally with a number of CPG companies across Europe to capture cost savings from an extensive distribution network. The initiative started in the Netherlands to meet customer requests for less than full truckload deliveries. After some research, Kimberly-Clark found that it shared a number of shipping lanes with Lever Fabergé (now Unilever). After setting up a joint logistics plan with Lever, the two companies worked with Hays Logistics to set up a new warehouse where both could store their products. Lever and Kimberly-Clark then worked with customers to receive orders for the same day, which were fulfilled by Hays. Customers benefited

FIGURE 1

Drivers of horizontal collaboration

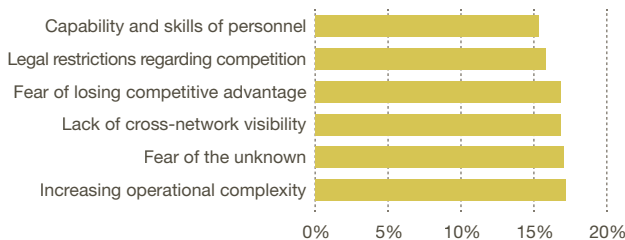


Source: Authors

was optimizing a Ford dealer’s parts supply chain when it noticed that there was significant overlap between Ford and GM. In many instances, dealerships were located in groups. OEM supplier locations tended to be tightly grouped as well. Sharing these

FIGURE 2

Barriers to horizontal collaboration



Source: Authors

OEM parts networks yielded significant cost savings and raised efficiency levels through better asset utilization and increased volume. It is important to note that in this case, HC happened between two dealer distribution networks that jointly agreed to share

because they were able to order twice as frequently with the same shipping costs. Kimberly-Clark was able to reduce inventory cycles, improve service levels and reduce its holding costs. As more companies joined this shared logistics hub, batch sizes came down even further and the process became even more efficient; eventually some 93% of Kimberly-Clark's product volume in the Netherlands was moved by shared deliveries, according to the CO3 Project.

After this initial success, Kimberly-Clark took a few years to find a partner it could trust in other locales. Eventually, it collaborated with Kellogg's in the United Kingdom. There, the two companies established a cross docking operation in southern England. Kellogg's products were sent from a northern facility to London where they were cross docked and shipped in smaller quantities with Kimberly-Clark's products to customers in southern England. The process quickly became permanent, and Kellogg's eventually began to cross dock Kimberly-Clark products in the north of the country for better distribution there as well. The fact that both companies were already working with the same 3PL, TGD, made the relationship easier to develop. The information flows were already set up with TGD and information sharing was quickly established. All three companies achieved significant benefits from this relationship.

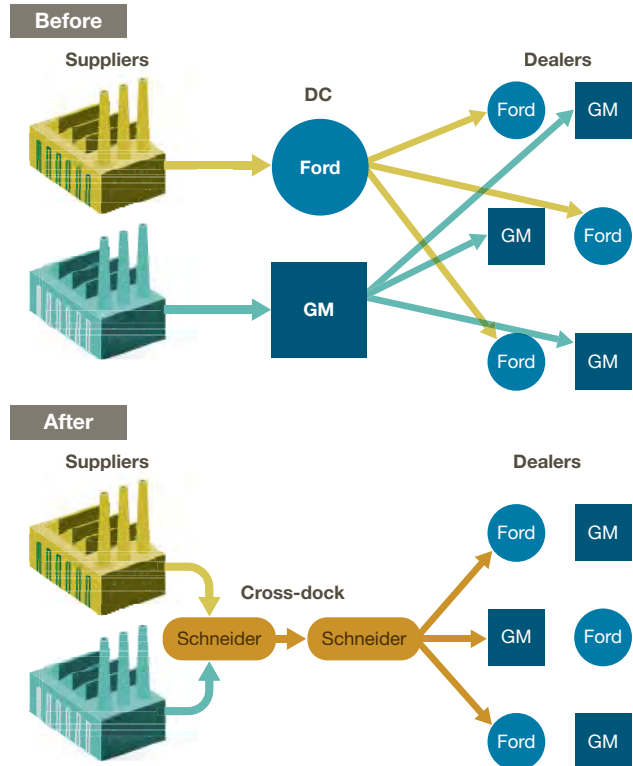
There are other examples of collaboration not only at the vertical or horizontal levels, but also at a multi-dimensional or "diagonal" level. For example, Walmart, Uber, Lyft and Deliv teamed up to implement a pilot for a last mile grocery delivery service that integrates the strengths of each participant. Walmart customers place online orders that are filled in one of the retailer's warehouses. Delivery drivers from Uber, Lyft and Deliv are equipped with GPS technology and mobile devices that enable them to access information on appointments. In addition to synchronizing the itineraries, the drivers also optimize route schedules using a suite of integrated applications.

A framework for success

The projects described above show that horizontal collaboration can take many forms. The MIT-ZLC research team grouped the different types of alliances into four frameworks:

FIGURE 3

Before and after horizontal collaboration—Representation of parts distribution networks



Source: Authors

- **Suppliers HC.** When suppliers get together to make joint decisions to coordinate the logistics flows associated with a particular customer.
- **Customer HC.** Collaboration between customers where the participants make joint logistics decisions to coordinate logistics from the producer.
- **3PL HC.** Where multiple 3PLs pair up to expand their networks and achieve greater efficiencies across their business models.
- **Inverse needs HC.** This type of collaboration happens when two companies with inverse logistical needs pair up to achieve savings (such as coordinating reverse load flows).

Although these frameworks differ in distinct ways, they follow a similar structure.

The process typically involves identifying the joint value propositions and gains that can be derived from a potential collaborative relationship. Having pinpointed the possible benefits, companies identify potential partners, pair with the chosen parties, establish a trustee, deploy a suitable contract and hopefully achieve their desired goals.

Using this basic structure, the researchers established a new framework for horizontal collaboration that takes into account the best practices identified in all of the aforementioned frameworks as well as the process for forming horizontal collaborations (see Figure 4).

In order to overcome the natural resistance most companies have to collaborating,

which HC can be improved, and then merges all of the current frameworks into one easy-to-use framework.

The role of a trustee

In this system, the process starts with the appointment of a centralized and neutral trustee. This party oversees the creation of HC relationships and adds value to every participant in the alliance. Third- and fourth-party logistics providers are uniquely situated to fulfill this role. They have connections with many clients, access to shipping information, the ability to drive the system and the financial incentives to make it happen. Sometimes they are not sufficiently incentivized to optimize all their customers' flows and cannot take a purely neutral role. But when they are able to participate, 3PLs and 4PLs can often sell the idea of horizontal collaboration to their clients; with their customer bases, they also have the ability to identify and create HC partnerships.

customer bases, they also have the ability to identify and create HC partnerships.

Engineer the best routes

The trustee's first task is to cross engineer routes. This is a process that finds optimal systems of transportation between logistics providers before collaboration occurs between shippers (see next section Making matches). At this stage, HC happens between logistics companies.

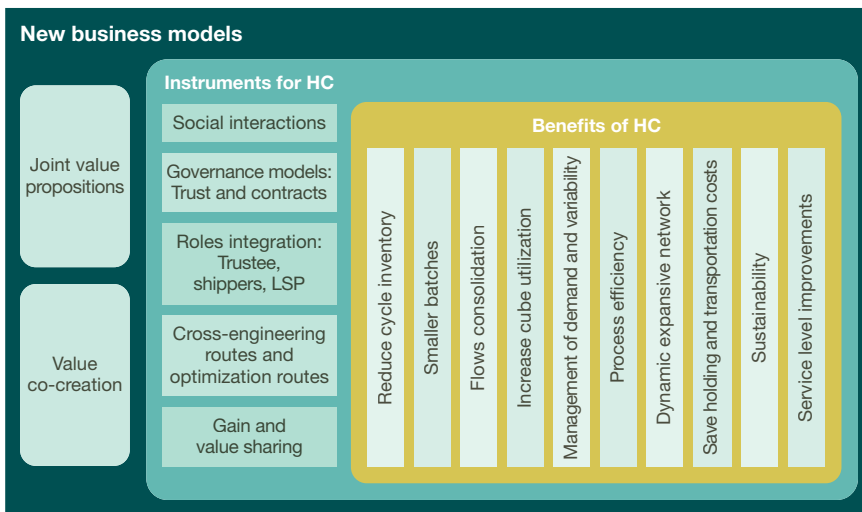
To fully understand the cross engineering routes, it is important to understand route engineering, a process by which logistics companies use dynamic

pricing of route times for given lanes. The logistics companies are able to maximize asset utilization by synchronizing flows, stabilizing demand and creating closed loop routes (see Figure 5).

For example, a logistics company may have shipments from point A to point B every Thursday and from point B to point C every Saturday. The company should naturally price route C to A lower on a day that allows them to get from C to A in time for the next round

FIGURE 4

Instruments for horizontal collaboration and its benefits



Source: Authors

the team analyzed successful horizontal collaboration relationships and created a market-driven system that will allow them to occur more naturally across multiple industries. This is offered as a complete system, but each part can act as a standalone process. It takes into account the drivers and barriers identified in Figures 1 and 2, what is working in horizontal collaboration today, the ways in

of deliveries. This creates a closed loop and prevents empty truck miles. Route engineering includes the development of incentives for shippers to change current structures. It is quite prevalent in the 3PL industry and serves to optimize the routes shippers use on a market demand basis.

Cross engineering builds on route engineering by taking into account the current routes of other collaborating logistics companies. The trustee then creates a pricing schedule that optimizes the asset utilization of all the participants. This may include sub-contracting or trading of routes to achieve the most efficient system. Naturally, cross engineering should also incorporate the logistics networks of companies that ship and store their own products. This system serves to connect many logistics providers together in a horizontal collaboration setting.

Once cross engineering happens, the trustee can propose route structures to the shippers in accordance with the most efficient pricing that takes into account multiple logistics providers systems. This step makes it easier for the shippers involved to collaborate because they can make decisions based on a common system. Achieving this level of commonality also streamlines the pairing process.

Making matches

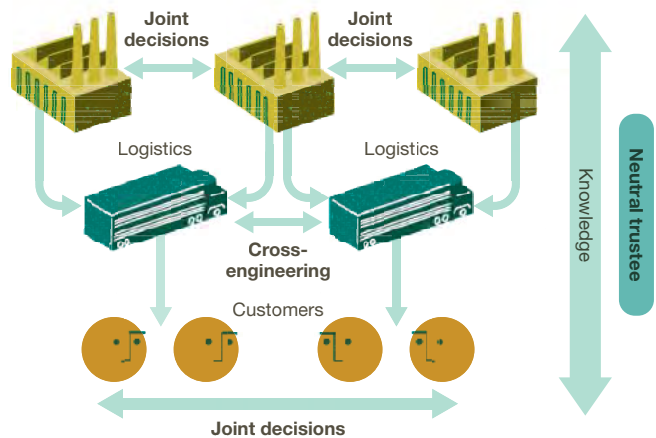
In order to expand the horizontal collaboration network, the trustee uses a statistical technique to identify additional potential shipping partner companies through a process we call smart recognition. Using data from current routes, companies that typically ship at the same times on a given lane can quickly be identified as possible pairs. In the case of the parts project involving GM and Ford dealerships, Schneider Logistics was able to recognize overlaps in supply chains and recommend pairings.

The statistical methods used in this stage of the process—basic statistical regression and time series analyses—should provide many insights into which companies are likely to establish successful pairings. The criteria used include: origins, destinations, delivery time-windows, frequencies of deliveries and their variabilities, compatibility of freight and handling, KPIs, information systems available or percentage of returns.

Smart Recognition should also take into account company organizational characteristics and past pairing relationships (after the system has been in use for some time).

FIGURE 5

Natural horizontal collaboration system



Source: Authors

Naturally, more data and more statistical analysis would help to predict better possible pairs in the future.

Next, the trustee pairs top potential partners, using a system of micro-pairing. This is a process of matching companies on only one route at a time. There can be multiple pairings on each route, and include large

The criteria used include: origins, destinations, delivery time-windows, frequencies of deliveries and their variabilities, compatibility of freight and handling, KPIs, information systems available or percentage of returns.

companies allied with each other as well as smaller players that are compatible in terms of the loads they transport.

When more pairs are available on the same lane, shipments can be more variable and higher levels of efficiency can also be attained. When many companies are paired

on the same lane with similar frequencies, one partner can deviate from the system without a having a large adverse effect on the other partners. However, when only two partners are paired on the same lane and one partner deviates, the other partner is at a much higher risk of losing the efficiencies gained through the partnership.

Key factors to consider when evaluating the compatibility of pairings are the partners' respective risk levels and flexibility.

Having identified and gained the support of likely partners, the trustee sets up a meeting to start the process of establishing a horizontal collaboration relationship. Key factors to consider when evaluating the compatibility of pairings are the partners' respective risk levels and flexibility. These two aspects are important from a gain sharing perspective—each participant must benefit from a relationship—and in terms of the synergies that can be captured by teaming up in this way. Baseline pricing and fee structures for the agreement can then be set, and the conditions for the partnership negotiated.

If the relationship is implemented, the trustee acts as an insurance company that charges fees to ensure that out-of-contract occurrences are properly compensated. The trustee also helps the partners manage risk through the most suitable diversification of horizontal collaboration relationships.

Systematic benefits

Horizontal collaboration can happen naturally in a system that is designed to foster the creation of such partnerships. But the collaboration model set out in this article has a structure that is founded on creating HC relationships efficiently and effectively at every level of the supply chain. In this system, all

About our research

This article is based on a research study conducted by the Zaragoza Logistics Center (ZLC, zlc.edu.es), an educational and research institute in logistics and supply chain management, established by the Government of Aragon in Spain in partnership with the Massachusetts Institute of Technology. ZLC is part of the MIT Global Scale Network (scale.mit.edu).

This study was developed in collaboration with Material Handling Industry (MHI), the largest material handling, logistics and supply chain association in the United States. The study aimed to identify horizontal collaboration practices today in the United States and Europe, show ways that horizontal collaboration relationships can be improved and develop a series of recommendations that serve to create a more natural system of facilitating horizontal collaboration in the future. The foundations of this research were based on current cases of horizontal collaboration, interviews with supply chain professionals and an analysis of an extensive survey conducted in 2015, which gathered 347 online survey respondents. The largest group of respondents was from Europe, Middle East and Africa (57%), 38% from North and South America and the rest (5%) from Asia and Australia. In terms of the respondents' position, 29% held executive level job positions, 50% at management level and 21% at non-management level.

players are incentivized to collaborate horizontally, which promotes benefits that build on each other.

The system is designed to facilitate the exchange of knowledge and value, and to increase supply chain efficiency through joint decision-making. In addition, the proposed system makes it much easier to find potential partners, pair up with them, improve profitability, gain market share and meet environmental goals.

Horizontal collaboration has been slow to take hold, especially in the United States. But, as companies as diverse as Kimberly-Clark, Walmart and Carreras have discovered, there are potential savings and efficiencies for those that take the time to do it successfully. ∞∞

Authors' note: We would like to acknowledge Gary Forger and Material Handling Industry (MHI) for their valuable contributions on this article.

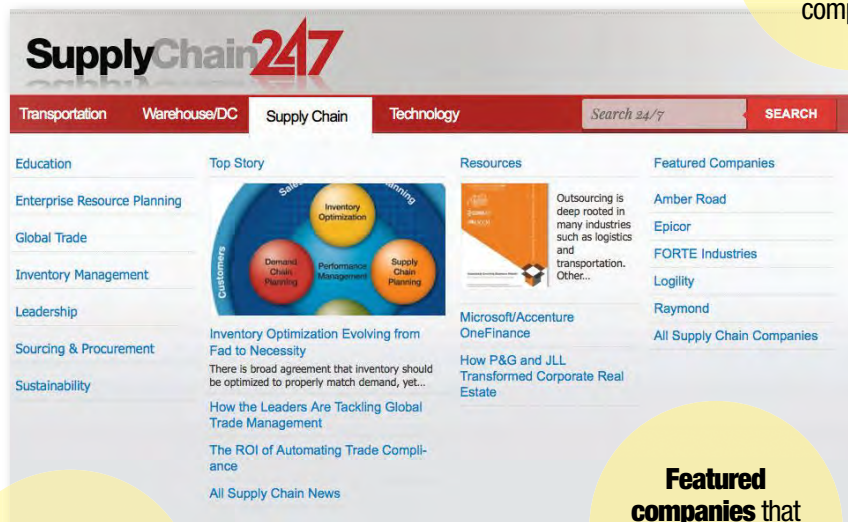
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BY PAOLO BORGHESI,
JON RIGBY, DAVID WHITE
AND JIM HART

GUARDING against cyber threats

In a world awash in cyber threats, partners and suppliers can be the vulnerable points that cyber criminals exploit to gain access to systems. Those challenges will get worse before they get better as supply networks become ever more complex. As a matter of urgency, business leaders must proactively balance cyber risks against opportunity, growth and profitability, starting with a clear-eyed view of the size and scale of the risks. Then it's time to set concrete expectations for suppliers. Here's a snapshot of the discussions you should be having right now.

Not too long ago, Goodwill Industries found that its customers' payments data had been breached by cyber criminals. Data from 868,000 payment card accounts was stolen. The entry point for the attack? Hackers had used malware to penetrate a third-party vendor's systems.

A year earlier, Target made news when it suffered a huge and highly publicized breach in which data from 110 million customers and 40 million payment cards was stolen. The national retailer's systems were initially breached via a connection with one of its vendors, an HVAC provider.

Goodwill and Target are by no means alone. Cyber breaches are proliferating year over year, affecting the confidentiality, integrity and availability of data; recent research by IBM indicates that just between 2014 and 2015, the number of such security incidents increased by 64%. These statistics probably reveal just the tip of the iceberg; they refer only to the security incidents that are detected and declared.

Retail and telecommunications companies are some of the most common victims of such attacks, but now, the Internet of Things (IoT) is also making manufacturing and production just as vulnerable. More broadly, ancillary sub-systems have proved alarmingly open to attack; there are well-publicized

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stories of car engine-control computers being accessed by hackers via CD players and tire pressure monitors. Seemingly innocuous devices have been used in massive denial-of-service disruptions; these attacks recently wreaked havoc on Amazon, BBC, CNN, Netflix and other household-name organizations when Internet-connected devices,

More cyber attacks—whether inadvertent or malicious—are coming from insiders: employees, contractors, consultants, suppliers and partners.

such as printers, cameras and baby monitors, were hacked.

At least as worrying: more of the attacks—whether inadvertent or malicious—are coming from insiders: employees, contractors, consultants, suppliers and partners. In nearly two-thirds of incident response investigations, a major component of IT support was outsourced to a third party, according to the 2013 Global Security Report from Trustwave, a security services provider. No business operates independently of partners or suppliers: A company's connections with those entities ranges from the exchange of purchase order details via e-mail or some other electronic exchange, to vendor-controlled facility management systems, to integrated design and production environments—all of which are potential security vulnerabilities. The push for greater efficiency and more innovation opportunities adds to the pressure to integrate with others in the supply chain, often without due consideration of the concomitant rise in business risk.

Of course, there is no shortage of techniques and technologies to minimize that risk. Even in the most complex businesses, it is possible to segregate information to allow for complete trust and openness with suppliers in one business process while blocking access to other information. The implementation of these safeguarding measures is not just an IT function; it requires business leaders to consider their information requirements as closely as they consider their physical pipeline, and it calls for commercial staff to write contracts that allow oversight of suppliers' information security.

It is not that business leaders aren't aware of the challenges—or aren't trying. More than two-thirds (69%) of public company board members report that their board is "more involved" with cyber security than it was 12 months earlier, according to a survey by BDO. That still isn't

enough. Despite this increase in awareness, just one-third (34%) of corporate directors report that they have documented and developed solutions to protect their business's critical digital assets. Clearly, more must be done.

In practice, business executives should adopt a risk mindset. Few of the useful risk-mitigation techniques can be truly effective if business leaders fail to balance the trust they place in partners and suppliers against the risks to their bottom line and value. They must weigh opportunity, growth and profitability against risk and make conscious investment decisions based on their business judgment. It is incumbent on executives and directors to educate themselves about cyber security and empower themselves to make informed decisions.

The obvious part of that imperative is to minimize the likelihood and thus the consequences of any data breach—regardless of where it occurs in the supply chain. For public companies, the consequences can be far-reaching: In the United States, the Securities and Exchange Commission's guidance requires that companies not only disclose material cyber security events when they occur, but also disclose material risks that could occur. For those companies that outsource functions with material risks, the guidance requires a description of those functions and how companies address the risks. But there is an upside to sound cyber security as well: Companies that truly embrace appropriately balanced cyber security measures could build capabilities that likely give them a considerable edge over their competitors.

The two Achilles heels of the supply chain

Any supply chain has both internal and external cyber vulnerabilities. This article is focused on the latter, but for context, it's worthwhile to look briefly at the internal issues.

Within the four walls of the organization, systems are becoming markedly more vulnerable to cyber attacks. This is especially true in the manufacturing industry, where industrial control systems (ICSs), based on proprietary technology, have historically controlled automated production processes. Those systems were isolated from the network, meaning that to use them, factory operators had to be physically present and know how to use them.

However, over time, ICS systems (such as SCADA,

for example) began using “standard” technology (such as the Windows operating system, or SQL server as a database) and are now connected to the corporate network so they can consolidate and share information across the enterprise. This provides significant added value in that it enables companies to monitor and manage production remotely, but it also increases the chance of being subject to a cyber attack.

Additionally, there are now more ways to access industrial control systems. Once they are more broadly networked, physical access is no longer required. The system might then be accessed by malware spread across the corporate network. The malware no longer needs to be custom written for proprietary operating systems because the new systems are based on common commercial platforms. Now, a simple malware infection on a corporate IT system can easily spread to the industrial system if not properly protected.

When you move outside the four walls of the organization, the problem is just as worrisome. Most companies now manage hundreds and sometimes thousands of external, outside vendor relationships, most of which involve some level of information sharing and access. This creates significant vulnerabilities, especially when these processes are automated. Gone are the days of fortification when a

company could build a firewall around its IT perimeter and protect its information; most companies can no longer even draw a distinct line around their network perimeters, so fuzzy are the boundaries between their networks and those of their partners. Vendor integration, along with the adoption of Cloud-based computing services and employee programs such as bring-your-own-device (BYOD) and telecommuting, have nearly eliminated the corporate perimeter entirely.

Some companies are now struggling to find ways to manage and govern this problem, which is not just an IT or procurement issue. It’s a corporate-wide risk issue, which now is getting the attention of legal and compliance groups. What, then, is needed? The answer is the development of more sophisticated oversight programs.

Dampening external supply chain risks

So what will it take to do that—and thus to mitigate cyber security risk in the supply chain? These days, there is no shortage of good information available to describe responses to cyber security in general. But the authors of this article have found that the following approaches are especially relevant for guarding against breaches of the external supply chain.

- **Map the data flows in the supply chain.** Most business



leaders now recognize that data is a primary asset, but fewer have a clear understanding of how data flows in and out of their companies, who they are sharing it with and how those flows are being managed and controlled—both internally and externally.

- **Plan a comprehensive risk assessment.** The organization's approach to cyber security should not be viewed in isolation from its mainstream business activities; they are too tightly interconnected. The level of protection has to be proportional to the potential impacts and likelihood of an incident. For this reason, an information security risk assessment could be the right way to assess the security of the supply chain and identify the critical areas to be addressed. The assessment will go beyond the data mapping noted above. Ideally, a third party whose independence can help ensure objectivity should conduct the assessment.

- **Align with emerging standards.** New standards have been developed as companies become aware of cyber security risks, especially with regard to the supply chain. In particular, organizations such as the Nation Institute of Standards and Technology (NIST) and the International Organization for Standardization (ISO) have published frameworks and guidelines related to the management of

Supply chain connections range from the exchange of purchase order details via e-mail or other electronic exchange, to vendor-controlled facility management systems, to integrated design and production environments—all of which are potential security vulnerabilities.

cyber security. These frameworks, created through collaboration between government and the private sector, use a common language to address and manage cyber security risk in a cost-effective way based on business needs without placing additional regulatory requirements on businesses. NIST has also produced a short animated video* about the framework that is intended for C-suite executives as well as cyber security professionals.

Many other organizations and standards-setting communities have followed suit with their own frameworks. One of the most important features of these frameworks is their emphasis on the importance of the capabilities needed to respond to

cyber attacks. The understanding is that attacks are inevitable, so rather than just seeking to guard against them, it is crucial to build systems with the resilience to rapidly respond and ideally to minimize the damage they can cause.

- **Set clear expectations in all supply chain contracts.**

Admittedly, this is easier said than done. Yes, contractual clauses around security levels and assurances are a necessary step, but many companies are struggling to define the levels of specificity required in such clauses, and wrestling with the issues of cyber security audits and enforcement monitoring. When you have thousands of suppliers, how can you possibly audit all of their security controls? It's hard enough to audit your own. Third-party certifications and attestations are helping, but there are still plenty of gray areas about the scope of the attestation and how effective they are. Certifications are also expensive and time-consuming for vendors to achieve, and it's difficult to define the level and type of certifications they need.

Furthermore, not all certifications are equal, and companies must be alert to clever marketing by suppliers boasting of certifications for new data centers, for instance. Customers must look closely to ensure that it is the vendor's own controls that are being certified—not just that the vendor is using a third-party data center that is certified.

Simplicity is the safest approach: Organizations should ensure that all of their outsourcing contracts require their suppliers to adhere to defined maturity and audit standards; that they do this in turn with their suppliers; and

that they agree to provide access to cyber security audit results at least once a year. If a supplier cannot show such results and is reluctant to agree to such practices, then perhaps their vendor status should be reconsidered.

- **Insure, but never depend on it.** Certainly, insurance coverage can help to shift the risk, but we are now seeing that it's often not enough to cover losses. For example, Home Depot, whose massive breach made headlines around the world a few years ago, is now up to hundreds of millions of dollars in costs and still has dozens of lawsuits pending. The cap for most insurance policies designed to cover damages from cyber security breaches is usually

about \$100 million, and many such policies have a myriad of gaps in their coverage. Moreover, coverage may be denied or limited where companies do not diligently assess and manage their data-sharing relationships. The patch-

There is an upside to sound cyber security as well: Companies that truly embrace appropriately balanced cyber security measures could build capabilities that likely give them a considerable edge over their competitors.

work of regulatory frameworks around security requirements, data privacy, and cross-border data transfer and data localization laws only serve to compound the problem and make governance more complex.

How suppliers should handle customer information

And what obligations do suppliers have? What should be their priorities when it comes to recognizing their roles and responsibilities in guarding supply chains against cyber attacks—and building more resiliencies into their systems when cyber criminals do break in?

As a fundamental, a supplier should understand the security protections they should be offering to protect their customers' data. A prerequisite, of course, is that they acknowledge and assess the connectivity between them, and thus have a clear idea of the risks that they, as the supplier, may be introducing as a consequence of their handling of supply chain data.

At the same time, suppliers should strive for compliance with recognized security certifications. The most common among these include the U.S. Health Insurance Portability and Accountability Act (HIPAA) assessments, the American Institute of Certified Public Accountants Service Organization Control Reports (SOC 2) and the Payment Card Industry Data Security Standard (PCI-DSS). As a recommendation, suppliers should be aligned with the ISO 27001:2013 standard—the internationally applicable Information Security Management System. However, compliance with those certifications is unlikely to be enough; suppliers must seek out and work to comply with certifications specific to their industries and to their customers' needs.

Moreover, suppliers must help prevent supplier fraud—a

growing problem these days, even though it doesn't require technical expertise by the perpetrators. Their customers stand to lose a lot if the procurement or finance team is duped by a legitimate-looking e-mail from a supplier asking

to change the banking details for a big payment. To minimize the likelihood of unwittingly enabling such scams, suppliers should proactively work to establish better lines of communication with their customers—for example, agreeing on a process

that includes additional steps for further confirmation of any such change to their banking details.

What opportunities can cyber security create?

So far, we have emphasized protection against the downside of cyber security breaches. But there is a more positive perspective too: the idea that high levels of supply chain data security can be used for competitive advantage. For example, promotes its ISO 27001 certification for Online Banking and Mobile Banking services on its Website.**

More and more customers can be expected to look for demonstrably high levels of security. Suppliers that can show bona fide security framework certifications such as ISO 27001 could conceivably expect to be able to factor those credentials into their pricing and future contract negotiations. Furthermore, proven cyber security credentials can be used to establish differentiation—to show that one's company is more secure than others in its markets.

Clearly, the topic of supply chain cyber security is timely and fraught with challenges all its own. There are far more subtleties and interpretations to describe than can be laid out in a single article. But if there is one message that the authors hope to convey, it is that the issue is not one that can be postponed until the next meeting of the board of directors—or worse, until the next security breach. British wartime leader Winston Churchill was famous for his insistence on “action this day.” We think that is an appropriate maxim for tackling the many cyber security onslaughts of the 21st century. ☺☺

* The NIST video can be viewed at nist.gov/cyberframework

** Barclay's online certification can be viewed at barclays.co.uk/Security/ISO27001certification/P1242561780370



Navigating the Reverse Supply Chain for Connected Devices

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The Internet of Things will change the way supply chains manage the lifecycle of products, as a slew of new connected devices come to market. The cell phone industry offers a model for how to handle connected products that are chock full of private, personal data.

Unless you were an early adopter of one of those clunky analog true cellular phones that were only available with per-minute calling plans, you probably don't have to look back beyond 15 years to remember your first mobile phone. The sales proposition was pretty universal across carriers: Sign a contract and get a free phone that would be subsidized by your monthly service payment. Then, every so often, you might be able to get an upgrade—but you probably had to switch providers to get the best “new customer” deals.

Those plans have almost all gone the way of the dodo. Service plans are now typically distinct from phone purchasing. Carriers often arrange financing options, but don't actually subsidize the cost of the phone. Though trade-ins are still commonly referred to as upgrades, they are based on the remaining values of the devices that are turned in. So what changed, and why does it matter to you as a supply chain manager?

BY IRV GROSSMAN AND JAMES KILKELLY

The seismic shift that affected practically the entire cell phone industry was the result of changes in the actual technology, its secondary market value and the supply chains that move the products. A slew of electronic products and everyday items not generally regarded as electronics, like appliances, are about to become technologically advanced, connected items as the Internet of Things explodes. As with the cell phone, manufacturers, distributors and retailers will not only manage the forward supply chain; they will also manage reverse logistics as some of those devices come back from the end user early in the sales cycle along with the repair, resale and ultimately the disposal of those products at the end of their useful life. The journey is akin to the cell phone's evolution from analog bricks with pull-out antennas to modern smartphones. That makes the cell phone industry the perfect barometer for anticipating game changing transformations in how manufacturers of all kinds will manage the lifecycles of the products they sell now that they are connected to the Internet and collecting personal data that must be managed.

New life for aging technology fuels revenue

Last year, over 1.4 billion smartphones were shipped to customers. That represents a growth rate of 300% over five years. However, volumes for new devices are beginning to flat line as evidenced by slowing iPhone sales reported by Apple. Sales growth that was anticipated in emerging markets is taking place, but it is being solved through reverse logistics by recovering and repositioning second-hand phones from North America and Europe to these highly price-sensitive regions. Coupled with deceleration in the velocity of new device sales, year-over-year performance improvement in new models has also declined and subsequent models offer fewer “must-have” features to encourage users to ditch their old devices. That means the viable lifecycles of devices is longer, but according to Gallup, more than half of American iPhone users upgrade every two years—flooding international markets with viable used devices.

Five years ago, a two-year-old smartphone was generally doomed to be unceremoniously thrown away or sold for spare parts. Today, secondary markets in places like Africa and Latin America have created strong demand for used devices based on price sensitivities that make

marketing the newest technology for a premium problematic for manufacturers. At the same time, environmentally conscious consumers do not want to send old cell phones to landfills just because they are done with them. We have entered an era where virtually every smartphone that enters the marketplace will come back through the supply chain. The scale of reverse logistics channels must equal that of forward logistics to keep pace, making smartphones one of the first near-perfect prototypes for building circular economies.

When used smartphones make their way back to manufacturers or carriers, they are destined for one of two primary fates: reselling or recycling. It is critical to have processes in place that evaluate the condition and viability of each unit so it is properly routed for reconditioning or disassembly—but either way, the device is coming back with something it never had when it left the factory: user data.

The devil is in the data

Questions about who actually owns the data on these devices have yet to be solved in a concrete way, but wise manufacturers are erring on the side of user ownership. Apple CEO Tim Cook has stated: “We believe the customer should be in control of their own information,” and, as an example, stood firmly against FBI demands to unlock data from one of the San Bernardino gunmen's iPhone. Because smartphones come back through the supply chain chock full of user data, secure wiping of that information is a crucial aspect of both reselling and recycling. Failure to completely eliminate the risk from this information necessarily results in lost consumer confidence and could lead to litigation.

The complexity of managing data contributes to making the reverse flow of smartphones more difficult to manage than forward logistics. However, the market is pressuring companies to recapture the value of smartphones that have life left in them due to a number of forces, including consumer concern over used products entering the waste stream, and carriers are eager to capitalize on recovering these devices so they can generate additional revenue from second-hand sales thereby introducing lower price points to entice new customers and prevent churn.

Evolutions in product lifecycle management and

The Internet of Things is going to see 5.5 million new devices come online every day this year; by 2020, there will be 20.8 billion connected items.

reverse logistics that the mobile phone industry is experiencing today are but a small indication of what the electronics industry at large is expected to face in the coming years. According to Gartner, the Internet of Things is going to see 5.5 million new devices come online every day this year; by 2020, there will be 20.8 billion connected items. Everything from cars to toasters to refrigerators will have connectivity capabilities, in both the consumer and enterprise markets. At the end of their useful lives, all of these devices will have to move through channels that do not exist today, and they will all be loaded with data that belongs to users and must be dealt with swiftly and securely.

Multiple lives of technology products

Producers like Apple are now feeling motivated to make quality products that can enjoy second lifecycles and secondary markets are rewarding them for doing so. This new paradigm is pushing manufacturers to actively manage these lifecycles—along with the required forward and reverse logistics—edging them closer to becoming hardware as a service providers and abandon the “sell it and forget it” mentality of yore.

Supply chains are feeling the pinch at both ends. While many of today’s electronics are being manufactured to experience multiple lifecycles, the individual lifecycle for each owner is shrinking because of dynamic consumer behavior. Smartphones have enjoyed the benefit of robust secondary markets, but the universe of connected devices is about to become so vast that many products will face unique challenges retaining value at the end their primary lifecycles. Regardless of whether these smart products ultimately get reused, refurbished or recycled, they will have to come back through proper channels because they will all contain user data with varying levels of sensitivity.

As a quick example, imagine a connected electronic product that retains value after its first lifecycle—let’s say it’s a smart refrigerator. A few years after purchasing, its owner decides that she wants a newer model, so the

unit heads back up the supply chain. Think about all the data that refrigerator is going to come back with—eating habits, food choices and maybe even credit card information. When you consider how much personal information could be gleaned from that data, it’s clear that it must be securely wiped before anyone new can take ownership, and it certainly can’t go straight to a landfill. If you have ever purchased a used car, or even rented one, that contained the previous user’s radio station presets, GPS coordinates in the navigation system or phone numbers dialed in the phone system, it’s the same exact mechanic.

That means that this product would necessarily have to go through a specialized process to completely eliminate the data. It’s easy to imagine the same thing happening all over again, as the unit gets passed on yet again to a third owner and so on down the line. Each time it changes hands, it has to be dealt with by whoever assumes responsibility for the process, and that could end up being manufacturers, dealers or some third party. Then, when all the ownership is over, the appliance will have to go through yet another supply chain to handle recycling. The circular economy demands that all parts—not just metal—are extracted and recycled properly. That includes circuit boards, rare earth metals and any other component used in the product.

This scenario takes for granted that it has been clearly decided that consumers retain ownership of their own data. What will perhaps emerge as an even larger question is who assumes liability for the data? If it does not get wiped properly or leaks out, who pays the price? The simplest answer to that question is whoever accepts the product back, which means anyone who wants to capitalize off second-hand value of these data laden devices will also have to assume significant risk. This will fuel a new level of security and checks in reverse logistics and could spur a cottage industry of specialty insurers equipped to deal with the problem and answer questions like: “What is the value of compromised data?”

Treasure troves of intelligence are buried deep in user data, but consumer ownership makes it forbidden

fruit for manufacturers to access when their products come back. They can ask consumers for permission to access it, but the market has not typically been receptive to handing over private information and in fact, merely asking the question can serve to erode trust in the relationship. When products come back through the supply chain, they can provide a great deal of intelligence to anybody who acquires them, and most companies would be best advised to take ownership of this process.

Reverse logistics management: From prize pig to derby champion

Think of this as an extension of what quality manufacturers already do when they analyze merchandise that is returned to them. Why did it come back? Did it fail structurally? Did it fail technically? Did it fail to meet consumer demands? Now multiply that by 100 because failure is no longer a litmus test in determining whether a product comes back to electronics manufacturers. The intelligence that can be acquired by conducting a post-mortem on every SKU sold stands to be game changing if managed correctly. Everything from designing a more rugged chassis to optimizing packaging materials will be affected by savvy producers.

All of this skin in the game, coupled with the likelihood that product manufacturers will begin bearing legal cradle to grave product lifecycle responsibility including fines for goods that are disposed improperly, provides ample motivation to design effective reverse supply chain channels. This model also lends itself to offering more products as a service, akin to the well-known lease model car dealers use—and that provides manufacturers with reliable, recurring revenue streams.

Problematically, this falls well outside the expertise of most companies, which have historically put much greater emphasis on forward logistics (a profit center) than reverse logistics (a cost center). The addition of ITAD (information technology asset disposition)—especially the disposition of enterprise equipment—to the mix makes this reverse flow even costlier and more complex; but even more necessary. Most importantly, the benefits of proper product repurposing and recycling temper the increased costs when implemented properly.

Faced with the responsibility and potential revenue of managing products after they have left the warehouse,

producers have two basic choices: manage the entire lifecycle themselves or engage with partners and outsource certain functions. It's a simple cost-benefit problem where outsourcing reduces risk and simplifies operations at the cost of some revenue. Deciding how to best leverage the new product lifecycles of electronics requires a comprehensive understanding of what the model looks like and an honest assessment of whether the skills necessary to deliver results are available or justifiable internally.

The first step in turning over products in the middle of their lifecycles is actually obtaining them. This varies based on the nature of the merchandise and multiple channels yield the best results because it requires action on the part of individual consumers. Parcel carriers are good options for small items that are easy to ship, but for large products or items with high values, retail partners who can accept the merchandise work well. Remember, these products will come back in a wide variety of conditions and in all sorts of creative ways—hardly ever in the same streamlined packaging they were originally shipped in. Entrusting third-party carriers also introduces the risk of protecting data while units are in transit, which the industry has yet to address in a meaningful way.

Once an item is received, it has to go through an initial evaluation triage to determine the best way to optimize its remaining value. The complexity of this process depends heavily upon the nature of the merchandise. The smartphone market, for example, is quite complex because of the diversity in the number of handset models that are in the market at any given time. Each SKU has its own unique demand curve—sometimes, identical models even experience significant differences in value depending on which carrier they are provisioned for. This makes value appraisal a key—and sometimes complex—component to get right in order to best route merchandise to its next destination.

From there, each unit gets routed down one of three paths that lead to reselling, recycling or disposition. But the paths are far from direct lines. The path that ultimately leads to reselling has many forks and the exact route is determined by things like how much and what type of refurbishing is needed, the type of necessary cosmetic cleanup, etc. Similarly, the recycling path can be equally complex with several disassembly and material

It is not unthinkable that the next decade could see legislation that makes manufacturers directly responsible for proper disposition of every material in every product they sell, and that makes taking control of end of lifecycle logistics a sound risk management strategy.

extraction processes involved. And as previously discussed, regardless of where the unit ends up, it must go through complete and verifiable data wiping.

Efficiencies can be gained throughout this process by identifying where the paths can share resources with existing forward logistics infrastructure. The speed at which the merchandise moves through the reverse chain is slower because it is less streamlined, and that makes it a unique operation distinct from forward logistics. However, manufacturing facilities have skills and processes that can sometimes be reversed to perform these functions using existing resources. In the simplest example, the people and equipment used to assemble products can generally be used to disassemble them.

With so many possible places to go and processes to go through, keeping track of returned products is vital. In forward logistics, tracking is generally performed by pallet or case, but returned products must be tracked individually as discrete items. The record of each item should not only be able to reveal the units physical location, but also every decision that has been made about it along the way that has advised its journey and even what facility was used for its production. As more connected items make their way back through supply chains, tracking will very quickly shift from a “nice to have” to “necessary for success.”

Geography and labor are also enormous factors in managing a process that is inherently more time consuming than forward logistics, but more importantly, involves products that depreciate quickly and can lose significant value by spending extra time in the supply chain. Despite the complexities that can be involved, keeping processes as streamlined as possible and minimizing transportation time are vital aspects to maximizing value in secondary markets. Calculating savings associated with geographies should consider the cost—and availability—of labor to perform all necessary functions.

Data wiping requires experienced technicians and security personnel, and high cost labor like software engineers can be needed for some processes.

Finally, asset disposition is a topic that has continued to emerge and is ripe to begin maturing, escalating its strategic value in long-term planning. Pressures from consumers and governments alike are driving motivation to keep as much material as possible out of waste streams. It is not unthinkable that the next decade could see legislation that makes manufacturers directly responsible for the proper disposition of every material in every product they sell, and that makes taking control of end of lifecycle logistics a sound risk management strategy.

Reasonable preparation for encroaching environmental change

Preparing for an uncertain future is uncertain business. Is Gartner right? Do we have less than five years before we are buried neck deep in connected devices? While that may be difficult to know, it is fairly certain that more connected devices appear on store shelves each year and this connectivity has crossed the threshold of traditional technology devices. Consumer attitudes on privacy and data ownership show no signs of softening, so it is advisable for manufacturers to begin taking steps now that assume at least some degree of reverse logistics for a large percentage of the connected devices they sell.

Consumer behavior driven obsolescence, thriving secondary markets and highly sensitive user data have all presented large challenges for the cell phone industry to overcome. That makes it the best model to serve as an archetype that all manufacturers of connected devices can learn from—paving the road to future profitability. The Internet of Things is primed to revolutionize manufacturer relationships with customers and elevate the customer-facing nature of reverse logistics. Be ready for it. ☺☺

The Future of Supply management

Predicting the future is a fool's game. But new findings from CAPS Research gives a glimpse into how supply managers are preparing for tomorrow.

BY THOMAS J. KULL, SANGHO CHAE AND THOMAS CHOI

When it comes to predicting the future, we've all heard the sayings that no one has a crystal ball and that the only certainties are death and taxes. In supply chain management, we like to say that the only thing certain about a forecast is that it is always wrong. While researchers like those of us at CAPS Research may not be able to predict the future, we do know that it does not exist in isolation: It depends on the past and the present. This means that if we could compile the collective projections of managers who are well informed about the past and present, we might be able to gain a glimpse into what is to come. Or, at the least, what the collective wisdom expects to occur.

That was the catalyst behind a project CAPS Research initiated in 2015. We asked more than 400 supply management professionals with titles such as vice president of supply management and senior procurement manager to look ahead five years into the future to 2020 and tell us what they think might happen. We distributed a lengthy questionnaire that typically took about 30 minutes to complete and we received back 113 responses. There were no incentives other than the opportunity to advance the body of knowledge in the profession.

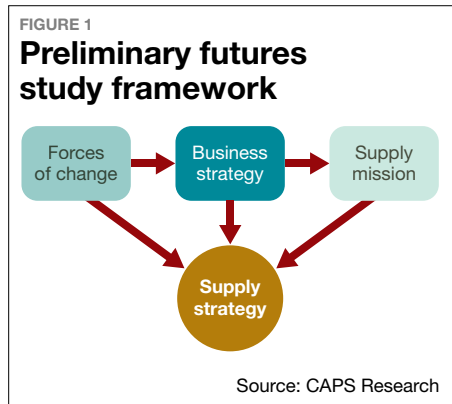


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In order to consider both the past and the present, the 2015 survey built upon the last “futures” survey CAPS Research administered in 2007. While some items were updated to reflect today’s business environment, most of the items remained the same. The preliminary framework (See Figure 1) recognizes that external forces of change drive corporate-level business strategies while supply missions are shaped by business strategies. Specific supply strategies are influenced by forces of change, business strategies and supply missions.



Based on this framework, the survey explored the following four areas: (1) external forces of change, (2) business strategy, (3) supply mission and (4) supply strategy.

In the following sections, we present the top items from each section; we also compare the 2007 and 2015 results to gain insight into what is changing for the supply management profession. Items are ranked by their average level of importance assigned by the respondents.

Forces of change

The top external force of change in 2015 is “changing customer requirements.” As shown in Table 1, this particular force of change is more important today than it was in 2007. It could be that supply professionals perceive that this external driver is moving them, comparatively speaking, away from an upstream focus on their supply base and more toward downstream concerns in the customer base. Corroborating this observation is (1) that a key upstream concern from 2007—i.e., “spot shortages of key raw materials”—is no longer listed in the top five forces in 2015 and (2) that “changing oil and raw materials prices” dropped from first position in 2007 to fourth in 2015. In other words, supply managers are telling us that in coming years they will have to contend more with what’s happening with their downstream customers.

Interestingly, “government regulatory changes” still remains the second most important force of change. We suspect the Sarbanes-Oxley and

Dodd-Frank acts may still be looming large, as well as the U.S. government’s cyber security mandate. In relation to this, an “increase emphasis on supply chain security” also appears for the first time in the top five in 2015. Another important change is “technology advancements in the supply base,” which is listed as the third most important force of change. Technology advancements in 3-D printing and real-time IT tools may be weighing heavily on the minds of supply professionals.

Business strategy

Business strategies represent the long-term goals and action plans of an organization’s top-management in response to external forces of change. Supply professionals see that their organization’s business strategies are becoming more customer-oriented, reflecting the shift in the forces of change toward meeting downstream customer requirements. Consistent with that change, we see in Table 2 that “achieve high service quality” appears as the top future strategic goal in 2015, moving up considerably from what it was in 2007. However, to “reduce the cost of purchased goods/services” and to “reduce internal costs” still remain as the second and third most important business strategies. In the supply management world, cost containment continues to be top of mind.

Newly listed in the top five business strategies, the goal to “realize synergies across divisions/SBUs,” may reflect the

TABLE 1
Forces of change

| Top five external forces in 2007 | Top five external forces in 2015 |
|--|---|
| 1 Changing oil/raw materials prices | 1 Changing customer requirements |
| 2 Government regulatory changes | 2 Government regulatory changes |
| 3 Increased competition from established competitors | 3 Technology advancements in the supply base |
| 4 Spot shortages of key raw materials | 4 Changing oil/raw materials prices |
| 5 Changing customer requirements | 5 Increased emphasis on supply chain security |

Source: CAPS Research

widely-held sentiment that supply professionals are being asked to do more with less: They must not only continue to handle upstream and internal cost issues, but now they are also responsible for downstream service quality and internal integration issues.

Nonetheless, this condition may also highlight a potential opportunity for supply professionals: Because they play a boundary-spanning role across the organization, supply professionals are perhaps best qualified to play key roles in integrating different divisions and strategic business units within their organizations. Data clearly suggest their expanding roles within their organizations.

Supply mission

Supply mission focuses on the future direction of the supply management function. We expected supply missions to fully reflect the ongoing environmental and organizational changes. What we see instead is a disconnect between supply missions and the changes in external forces and business strategies from 2007 to 2015. While forces of change and business strategies are increasingly concerned about the downstream requirements of customers, supply missions still largely focus on the traditional upstream activities associated with suppliers. For example, as shown in Table 3, “achieve consistent cost savings from suppliers” and “ensure continuity of supply” were the first and second most important supply missions in 2015. Moreover, “improve all aspects of supplier performance year-over-year” is in fourth place in 2015, albeit down from the second place in 2007. Each of these are clearly supplier, rather than customer, in focus.

We also observe that standardization and de-proliferation were critical in 2007 but are no longer a top-five supply mission in 2015. It could be that the supply management functions of many organizations already achieved a desired level of standardization in their products and processes. Related to Table 2’s business strategy of realizing synergies across divisions/SBUs, “improve the efficiency of the supply management function” newly appears as a major supply mission. Lastly, the supply mission to “acquire new

value-adding technologies and innovations from supply markets” directly relates to the third most important force of change in Table 1: “technology advancements in the supply base.” Such relationships show how the mission of supply management is directly being influenced.

Supply strategies

Supply strategies are about the specific goals and plans of the supply management function. Similar to what we observed with supply missions, the external pressure for a downstream focus has not yet trickled down to overall supply strategies. Yet, as the supply function strives to be aligned with the top-management, the number one supply strategy shown in Table 4 remains the same in both 2007 and 2015: “align supply management strategy with overall company goals.”

Other supply strategies for internal alignment and

TABLE 2

Business strategy

| Top five business strategies in 2007 | | Top five business strategies in 2015 | |
|--------------------------------------|---|--------------------------------------|---|
| 1 | Reduce cost of purchased goods/services | 1 | Achieve high service quality |
| 2 | Improve flexibility and responsiveness to customer demand | 2 | Reduce cost of purchased goods/services |
| 3 | Reduce internal costs | 3 | Reduce internal costs |
| 4 | Achieve high service quality | 4 | Realize synergies across divisions/SBUs |
| 5 | Achieve high product quality | 5 | Improve flexibility and responsiveness to customer demand |

Source: CAPS Research

TABLE 3

Supply mission

| Top five supply missions in 2007 | | Top five supply missions in 2015 | |
|----------------------------------|--|----------------------------------|---|
| 1 | Ensure continuity of supply | 1 | Achieve consistent cost savings from suppliers |
| 2 | Improve all aspects of supplier performance year-over-year | 2 | Ensure continuity of supply |
| 3 | Drive standardization/de-proliferation | 3 | Improve the efficiency of the supply management function |
| 4 | Achieve constant cost-savings from suppliers | 4 | Improve all aspects of supplier performance year-over-year |
| 5 | Improve the utilization of organization assets | 5 | Acquire new value-adding technologies and innovations from supply markets |

Source: CAPS Research

cross-functional integration frequently appear in the top 10 list of 2015—instead of showing the top 5 strategies, we show the top 10 because of the extensive list of supply strategies we examined. As supply base rationalization has advanced and the popularity of supply chain jobs has increased, “decreasing the number of suppliers” and “talent development,” both important in 2007, are no longer listed as top supply strategies in 2015. Instead, supply professionals increasingly recognize the importance of centralized key spend category management and data analytics. Regarding data analytics, the focus seems to be shifting from sharing market intelligence to forecast analytics.

Influences of the external forces of change

In the next few sections, we examine the correlations between the forces of change and the other three sections. Doing so statistically represents some of the relationships in Figure 1, while also examining how external forces relate to supply missions. The values in these correlation tables represent the degree to which the importance given to one item is related to the importance given to another item. Values range from -1 to 1, where 1 means managers would rate both items similarly (i.e., both high or both low), and

-1 means managers would rate the items completely opposite (i.e., one high and one low). An asterisk next to a value indicates that that value represents a significant or statistically meaningful correlation.

Regarding the correlation between forces of change and business strategy, as one would expect, “changing customer requirements” is significantly correlated with “achieve high service quality” and “improve flexibility and responsiveness to customer demand.” (See Table 5.) These correlations confirm our earlier observation that organizations are increasingly becoming customer-oriented.

“Changing oil/raw material prices,” “supply base technology advancements” and “increased emphasis on supply chain security” have significant correlations with business strategies for “reducing costs” and “realizing synergies across divisions/SBUs.” These trends imply that organizations are taking advantage of the recent decreases in oil/raw materials prices to reduce costs while increasing cross-functional efforts to increase security and innovation.

Interestingly, “government regulatory changes” do not show any significant correlations with the top five business strategies. As we discuss below, it seems that government regulatory changes are penetrating directly

to the supply management function, without significantly influencing overall business strategies. This point becomes clearer as we consider correlations between external forces of change and supply mission.

Table 6 shows the correlations among the forces of change and supply missions. Unlike their non-significant influences on business strategies, “government regulatory changes” seem to have direct effects on multiple key supply missions: cost savings from suppliers, supply continuity and supplier performance improvement. “Technology

TABLE 4
Supply strategies

| Top 10 supply strategies In 2007 | Top 10 supply strategies In 2015 |
|--|--|
| 1 Align supply management strategy with overall company goals | 1 Align supply management strategy with overall company goals |
| 2 Decrease number of suppliers where leverage and administrative efficiency are needed | 2 Employ a formal process to develop and manage supply strategies for important categories across the organization |
| 3 Employ a formal process to develop and manage supply strategies for important categories across the organization | 3 Manage total expenditures for key categories across the organization |
| 4 Align supply management strategy with internal customer strategies | 4 Use total cost to drive decisions |
| 5 Integrate business planning and supply management processes | 5 Conduct spend analysis across the company in both products and services |
| 6 Recruit and/or develop talent with specific technical or functional expertise | 6 Align supply management strategy with internal customer strategies |
| 7 Recruit and/or develop talent with broad general management expertise | 7 Integrate business planning and supply management processes |
| 8 Use total cost to drive decisions | 8 Require suppliers to take a greater role in cost management |
| 9 Share supply market intelligence across units of the organization | 9 Measure our own supply management performance on formal objectives |
| 10 Use multi-factor performance standards on suppliers | 10 Use forecast analytics as inputs to category strategy development |

TABLE 5

Correlation between forces of change and business strategy

| External forces of change | Business strategy | | | | |
|---|------------------------------|--------------------------------|-----------------------|------------------------------------|---|
| | Achieve high service quality | Reduce cost of purchased goods | Reduce internal costs | Realize synergies across divisions | Improve flexibility and customer responsiveness |
| Changing customer requirements | 0.215* | 0.069 | 0.044 | 0.059 | 0.237* |
| Government regulatory changes | 0.086 | 0.122 | 0.111 | 0.177 | 0.037 |
| Technology advancements in the supply base | 0.146 | 0.090 | 0.186* | 0.114 | 0.184* |
| Changing oil/raw materials prices | -0.169 | 0.212* | 0.082 | 0.186* | -0.137 |
| Increased emphasis on supply chain security | 0.155 | 0.234* | 0.214* | 0.265* | 0.190* |

Source: CAPS Research

TABLE 6

Correlations between forces of change and supply mission

| External forces of change | Supply mission | | | |
|---|--|--|-----------------------------|--|
| | Achieve consistent cost savings from suppliers | Improve the efficiency of the supply management function | Ensure continuity of supply | Improve all aspects of supplier performance year-over-year |
| Changing customer requirements | 0.077 | 0.050 | 0.121 | 0.132 |
| Government regulatory changes | 0.251* | 0.146 | 0.283* | 0.308* |
| Technology advancements in the supply base | 0.218* | 0.272* | 0.242* | 0.304* |
| Changing oil/raw materials prices | 0.221* | 0.087 | 0.157 | 0.285* |
| Increased emphasis on supply chain security | 0.238* | 0.204* | 0.302* | 0.286* |

Source: CAPS Research

material prices are providing opportunities for the supply function to invest more in performance improvements. Importantly, however, changing customer requirements do not seem to be a leading supply mission.

As we previously observed, there is a disconnect between external pressures for customer-orientation and the supply missions. While business strategies are fully embracing customer-centric trends, the supply function is yet to adjust to these changes. This disconnect is observed again in the correlation between forces of change and supply strategy.

As shown in Table 7, external forces of change in terms of government regulation, technology advancements, raw material prices and supply chain security are largely shaping supply strategies. Such influences are similar to supply missions in Table 6. Again, “government regulatory changes” have prominent effects on both supply mission and supply strategy.

advancements in supply base” and “increased emphasis on supply chain security” are the two most salient forces that influence every key supply mission. Through this trend, we can surmise that supply professionals now fully recognize the opportunities provided by technological advancements from upstream supply chains as well as the potential security threats from supply chains.

Moreover, the cost savings from changing oil/raw

However, when it comes to the most important force of change—changing customer requirements—we also observe that supply strategies have not yet fully embraced this looming change. While external forces such as government regulatory changes bypass business strategy and penetrate directly into supply mission and strategy, changing customer requirements are still limited to top-management’s concerns. This may indicate that the supply

function is still developing strategies about how to respond to customer requirements. For the next five years, translating customer requirements into supply missions and strategies will be important areas to focus on for supply professionals.

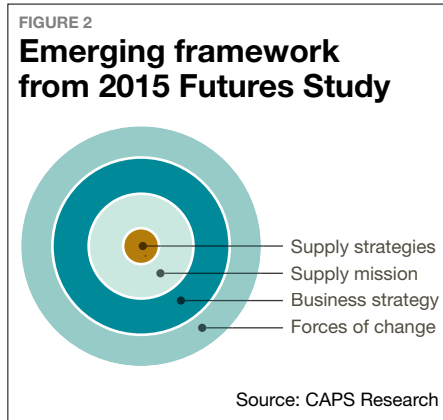
Emerging framework from 2015 Futures Study

Based on the observations so far, we revised the preliminary framework from the 2007 Futures Study (see Figure 1) and now present the emerging framework from the 2015 Futures Study in Figure 2. In the revised framework, the external forces of change penetrate directly into supply mission and strategies. In particular, government regulations, supply base technological advancements and supply chain security issues are directly shaping the changes in the supply management function.

Key Takeaways

When we look at the main findings of the 2015 Futures Study, five key takeaways stand out:

1. Customer-centric supply management has the



potential to become the most important driving force for supply management in the near future.

2. Rapidly changing technologies are driving integrations within and between organizations and enhancing visibility across supply chains.

3. The importance of supply disruptions has been de-escalated.

4. With the increasing importance of cross-functional alignment, supply professionals must further the organization's strategy, not just supply management's strategy.

5. We find that macro-level changes with customers, government and technology directly influence micro-level supply plans.

Take this one step further, and the new study reveals the evolving role of supply professionals in the future. To perform in these new roles, a proactive understanding of changes outside the traditional supply management function is required. We believe that the proactive supply professional of tomorrow will be an integrator who balances the needs of different organizations in supply chains as

well as different functions within their organization. Supply professionals will also be keeping the core of supply management by achieving efficiencies in the supply base and within the supply function. Lastly, supply professionals will serve as the source and disseminator of knowledge by capturing and using supply-related knowledge.

And while we do not have a crystal ball, we do believe an exciting future awaits the supply profession and we hope this report helps today's supply managers prepare for what comes next. ☺☺

TABLE 7
Correlation between forces of change and supply strategy

| External forces of change | Supply strategy | | | | | |
|---|---|--|--|--|-----------------------------------|---|
| | Align supply management strategy with overall company goals | Align supply management strategy with internal customer strategies | Employ a formal process to develop and manage supply strategies for important categories across the organization | Manage total expenditures for key categories across the organization | Use total cost to drive decisions | Conduct spend analysis across products and services |
| Changing customer requirements | 0.076 | 0.007 | -0.157 | -0.004 | 0.023 | -0.094 |
| Government regulatory changes | 0.260* | 0.204* | 0.261* | 0.261* | 0.078 | 0.112 |
| Technology advancements in the supply base | 0.245* | 0.274* | 0.139 | 0.142 | 0.130 | 0.135 |
| Changing oil/raw materials prices | 0.151 | 0.076 | 0.276* | 0.232* | 0.072 | 0.049 |
| Increased emphasis on supply chain security | 0.166 | 0.228* | 0.153 | 0.099 | 0.212* | 0.080 |

Source: CAPS Research

Procurement performance: *Voice of the Stakeholders*

In the most recent *ROSMA Performance Check Report*, A.T. Kearney finds a mixed view among stakeholders when asked about the value procurement delivers and why and when procurement is engaged.

By Joe Raudabaugh

Joe Raudabaugh is a partner with A.T. Kearney and founder of A.T. Kearney Procurement & Analytic Solutions. He is based in Chicago and can be reached at joseph.raudabaugh@atkearney.com.



The A.T. Kearney 2016 *ROSMA Performance Check Report*, “So, This is What Good Looks Like,” details what customers say about their procurement team’s performance. The report includes a *Voice of the Stakeholders* segment that captures the views of non-financial, non-procurement executives about the performance of their procurement organizations. With the addition of the stakeholders research we now have three comprehensive views on procurement performance—CPOs self-reporting, CFOs and stakeholders.

The view among stakeholders is mixed when asked about the value procurement delivers as well as why and when procurement is engaged. There are five well-defined and differentiated performance segments: Leaders, Leaners, Strugglers, Inconsequential and the Pack.

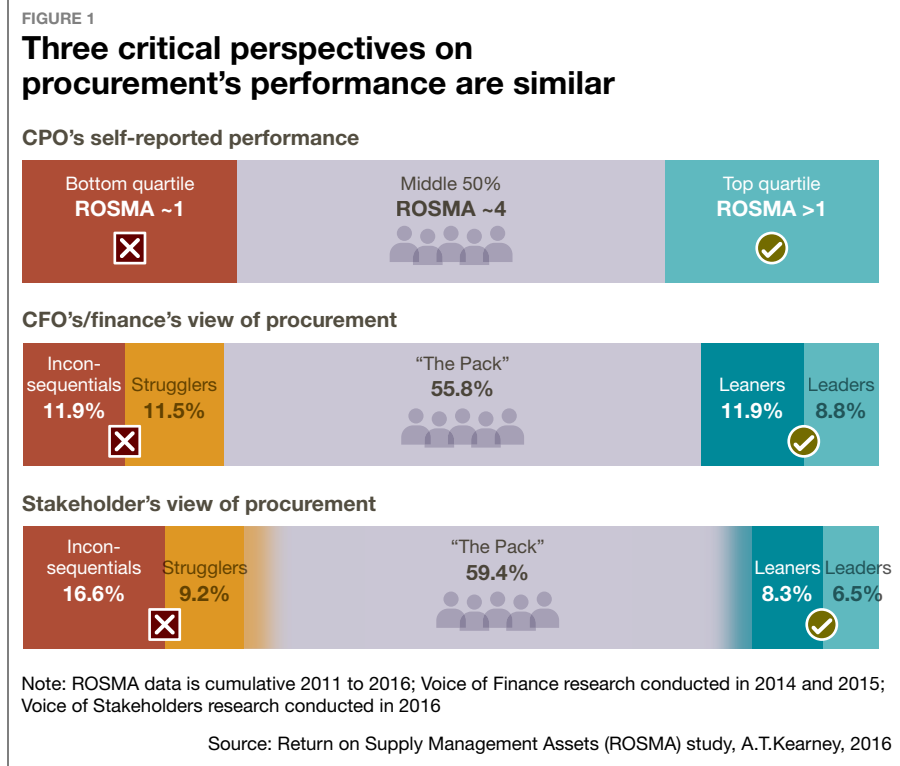
Leaders and Leaners

The good news is that some teams—the top 15%, or Leaders and Leaners—have built strong

brands with their procurement stakeholders. This finding is very similar to the verdict of CFO and finance stakeholders (as reported in our 2014 and 2015 reports) and in line with CPOs who report top-quartile ROSMA performance.

Procurement Leaders and Leaners have stakeholders who know what good looks like (evaluating by types of capabilities, mix, scale and results), and have great procurement teams that match that profile and are recognized and





celebrated. All said, top procurement teams have a wealth of capable and respected talent, who engage strongly and effectively across the organization and deliver value that is measured, reported and substantive. The seven attributes of these strong performers are highlighted in “So, This is What Good Looks Like.”

The three independent views on procurement—CPOs in the *ROSMA Performance Check Report*, stakeholders in the *Voice of the Stakeholders* research and CFOs in the *Voice of the CFO and Finance Community* research (2014 and 2015 reports)—are virtually identical across all the performance segments (see Figure 1).

Understanding the weak performers is also important. Inconsequential have very distinct profiles in both the prior CFO and current stakeholder research; respondents say there is no identifiable leadership accountable for procurement's performance, stakeholder satisfaction or resource productivity. In the case of Strugglers, there is recognition that leaders exist and are named and accountable, but otherwise, the Inconsequential and Strugglers receive identical reviews from stakeholders who view those in the bottom quartile as follows:

- Procurement is a service function that is engaged when the business needs it for contracting, purchase orders or

assistance with negotiations—but is rarely involved early in the process.

- Procurement does not have a seat at the table.
- Performance metrics are either not well-defined or limited in scope.
- Finance evaluates procurement performance only about 35% of the time, and about one-third of stakeholders are unsure if performance is tracked at all.
- Reported results are challenged about 90% of the time, while 10% of stakeholders are unaware of routine or ongoing performance reporting.
- Stakeholders believe that only about 10% of reported savings are realized.

- Most stakeholders do not know what the industry benchmarks are (for example, return on investment) for either good or weak procurement performance levels.
- All stakeholders either know what world-class procurement looks like and acknowledge they do not have it, or are unsure what world-class procurement looks like and believe it is worthwhile to know.

The bottom quartile self-reports very weak productivity through the 2016 ROSMA benchmarking platform, with 80% delivering less than \$1.90 in return for every \$1 incurred in the function. Most are barely trading dollars or are dilutive. The 2016 reporting population is marginally better than the cumulative view, which reports an average ROSMA of 0.98. All of the underlying value-driver metrics lag for this segment, validating the narrative from the *Voice of the Stakeholders* research as well as the exhaustive voices of the CFO research reported in 2014 and 2015.

The Pack

The mainstream of the procurement profession resides in the Pack and are among the 50% of organizations that constitute ROSMA middle-tier performers. They consistently deliver about four times their return on investment in procurement

Either by choice and leadership or through interventions, the performance variance within the profession will shrink, transparency will increase, and the negative stakeholder voices will join to become a single positive declaration of success.

activities. In 2016, the ROSMA drifted up to 4.37, lifting the cumulative average to 4.18 and surpassing the prior peak of 4.14 achieved in 2014. What do these numbers mean? Over the course of eight years of ROSMA benchmarking, we have not seen any multi-period trend in which performance gains or improvement initiatives have been effective. Despite the increased interest in the value of procurement and the growing evidence that top-quartile performance is twice as high or more (and widening), the Pack has not demonstrated a competitive upward drift.

The Voice of the Stakeholders research for the Pack offers mixed insights across more than 20 assessment questions consistent with the CPOs' reported ROSMA value-driver data. Fifty-eight percent of stakeholders perceive procurement as a business service function rather than a business partner. Depth and breadth of performance metrics and reporting practices are stronger than the bottom quartile segments but are notably lagging the Leaders. Yet with some modest shift toward active value management and performance reporting visibility, this group could dramatically improve.

Finally, as procurement continues to search for better performance, improved consistency and more predictable results, we asked stakeholders to share up to three words that describe their perception of procurement. Even this qualitative assessment highlights the variability issue. While descriptions of Leaders and Leaners is overwhelmingly positive, the sentiment toward Inconsequential and Strugglers is intensely negative, with 66% of stakeholders using words that describe underperformance. The Pack registered a neutral to slightly positive sentiment.

So, This is What Good Looks Like

The ROSMA Performance Check Benchmarking and the *Voice of the Stakeholders* research illustrate what good looks like for stronger teams. The seven attributes of good procurement tell a compelling story:

1 Strong procurement teams are recognized by their

stakeholders as integral business partners with a seat at the business leadership table; they consistently work together on most or all projects and are brought in early in the process.

- 2** All stakeholders, from both business and finance, say that procurement leaders are accountable for results, stakeholder satisfaction and team productivity.
- 3** Procurement has well-defined and respected performance metrics that all stakeholders understand and support. What counts gets measured and what's measured gets done.
- 4** Finance and procurement jointly (or finance independently) routinely and thoroughly evaluate procurement performance; results are shared with stakeholders and are widely accepted and only occasionally challenged.
- 5** Principal stakeholders (the C suite, finance and the businesses) are aware of and understand procurement value drivers, including the concepts of coverage, velocity, yield and compliance, and they know the desired performance ranges for each.
- 6** Principal stakeholders have a rich understanding of how procurement creates and delivers hard value to the business's financial results and thus are considered effective in the spend-management process.
- 7** Top-quartile performers deliver a minimum ROSMA score of 7 or higher and again reported an average score of 12. Despite this strong performance, if this quartile sustained 75th percentile performance across main results drivers, productivity would increase another 50%.

In the future, good procurement is destined to be even bolder and more daring than today, spurred by a wealth of opportunities to manage the value and brand of procurement. Either by choice and leadership or through interventions, the performance variance within the profession will shrink, transparency will increase, and the negative stakeholder voices will join to become a single positive declaration of success. In the eye of disruption, the bar for leadership performance gets even higher. ☺☺

If you would like to read the complete A.T. Kearney 2016 ROSMA Performance Check report, "So, This is What Good Looks Like," visit atkearney.com/procurement/rosma.

A SPECIAL SUPPLEMENT TO:

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MANAGEMENT REVIEW





Measuring *the* **VALUE** *of* supply chain **EXECUTIVE EDUCATION**

Executive-level supply chain positions have gained both prominence and importance for today's global companies. To support this trend, universities and colleges have enhanced their supply chain and logistics degree programs; organizations like APICS and the Institute for Supply Management (ISM) have expanded their certification programs; and training firms offer myriad options to help executives stay current on supply chain trends.

BY BRIDGET McCREA

It wasn't that long ago that supply chain managers worked mainly behind the scenes, stealthily orchestrating the movement of products from the raw material stage to manufacturing/production and right on through to the final delivery of the finished goods. Typically occupied by employees who had successfully "worked their way up" through the company, these executive-level supply chain positions have over the last few years gained both prominence and importance for today's global companies.

To support this trend, universities and colleges have enhanced their supply chain and logistics degree programs; organizations like APICS and the Institute for Supply Management (ISM) have expanded their certification programs; and training firms offer myriad options to help executives stay current on supply chain trends. These executive education offerings provide executives with the opportunity to hone their skills, upgrade their technology acumen and better understand the inner

workings of the modern-day supply chain.

In some cases, the executive education is served up in the traditional classroom setting, but increasingly we're seeing more interest in short sessions (one or two days), online course delivery, or hybrid options that combine the two. The programs can be non-degree-granting, certification-based, or lead to a full-blown degree in supply chain management or other subject. Customized programs that

In most cases, advanced education can translate into better opportunities for advancement, improved job prospects, more respect or status (as compared to those employees who may not participate in executive education) and even higher salaries.

are tailored to the needs of individual companies are also growing in popularity, with most offerings targeted to supply chain professionals that are already employed in managerial and executive roles (or those who aspire to).

The question is, what value do current supply chain professionals gain from executive education and how can they apply these advantages for their companies and in their own careers? In most cases, advanced education can translate into better opportunities for advancement, improved job prospects, more respect or status (as compared to those employees who may not participate in executive education) and even higher salaries. For employers, this type of education supports employee retention while ensuring that executives have the latest, most relevant knowledge and skills they need in order to do their jobs.

In this article, we'll delve further into the true value of executive education for today's supply chain professional, outline some of the key benefits that it offers and hear how providers are stepping up to meet the growing needs of their executive students.

Making your personal stock go up

According to John Caltagirone, the value of supply chain executive education goes beyond just providing better advancement opportunities and salaries. "It's going to make your personal stock go up," says Caltagirone, founding director of the Loyola Business Leadership Hub of Loyola University Chicago. "It will make you more valuable to your employer and that will lead to a stronger career and higher income."

By participating in executive education, Caltagirone says professionals also gain access to networking opportunities that could eventually lead to new career prospects, valuable information sharing and other career-building interactions. "We have about 78 corporate members—most of them large firms like McDonald's and Walgreens—that can't wait to get together and brainstorm challenges and come up with solutions together," says Caltagirone. "They work together to solve inventory problems, address supply chain issues and come up with ways to solve some of their biggest pain points."

In other words, executive education programs not only provide knowledge and nuggets of useful wisdom, they also encourage relationship building, brainstorming and a focus on continuous improvement. "If you're serious about your profession, participating in these programs, getting a degree, attending a workshop or getting a certificate will all give you takeaways that you can use on the job," says Caltagirone.

Caltagirone says executive education is particularly relevant for supply chain executives who may have come from a different side of the business, such as marketing or finance. More and more of these professionals are being "pulled into" positions like VP of supply chain, says Caltagirone, and may need additional education to get them up to speed on the fine points of global and domestic supply chain management.

Finally, Caltagirone says the millennial generation is another good candidate for the additional education, experience and networking the supply chain executive education provides. Not always eager to register for a Master of Science in Supply Chain Management degree or an MBA program, these younger professionals lean more toward bite-sized educational offerings that hit on specific, supply chain-related topics.

"Because of this, we started offering certificates," says Caltagirone. From the experience, students take away specific knowledge and training on topics like global supply chain management, inventory control and purchasing. "So instead of taking 18 courses over an 18- to 24-month period, students can take five courses and earn a certificate," he says.



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If your employer values it, go for it

Steve Tracey, executive director for the Penn State Smeal College of Business' Center for Supply Chain Research, says he's come to the simple conclusion about executive education and certification: If your employer values it, then it's probably worth pursuing. But if the company doesn't put an emphasis on such education—or the value it can bring to the organization—then it's purely a personal investment.

"Some employers do value it and some don't," says Tracey. Certifications can be an especially tricky area, namely because these programs center on technical expertise and rarely focus on bigger topics like leadership and strategy. "You can't really develop and educate people on leadership and strategy through a correspondence course," Tracey says. "So where certifications may work for a tenured employee with less than seven years of experience, once you start getting up into the higher levels, that type of education doesn't add that much value."

The value of supply chain executive education also extends to the companies themselves, which can use it to retain their top supply chain employees. A firm that sponsors executives who attend a Master's in Supply Chain program, for example, may ask for a minimum, post-graduation time commitment (of say, three years), thus ensuring that he or she doesn't jump ship once the diplomas are handed out. "The hope, of course, is that the person will stay long after that three years is up," says Tracey, "based on the fact that they invested that money in the employee's degree."

Within companies, Tracey says those that do value ongoing education tend to cast a more favorable light on executives who have made the effort in that area. "If you're working for a large organization, a series of certifications or a master's degree could both be differentiators within that company, particularly when it comes to salary bumps," says Tracey. "However, I think it's rare to find a company today that would hand out a promotion to someone simply because he or she completed an educational program."

To help clear up any ambiguity in this area, Tracey says employers should be very clear about whether they do (or don't) value executive education, including degrees, advanced degrees and certifications. "Have a stated strategy and policy about what these efforts mean within your organization, and communicate it to your employees," says Tracey. "This helps with employee retention and ensures

that professionals aren't left guessing as to whether they should put the time and effort into executive education."

Measure the personal ROI first

As supply chain itself becomes more and more intertwined with other disciplines, Caltagirone expects the related executive educational offerings to follow suit. "I have a new graphic that I used in class that depicts what the supply chain looks like right now, and it literally includes everything but the kitchen sink," says Caltagirone. "If you make a product, buy a product, move a product or store a product, you're involved with supply chain."

Nick Little, assistant director of executive development programs for Michigan State University's Broad College of Business, concurs, and says demand for executive education is being driven by the fact that neither organizations nor their supply chain professionals can operate in vacuums any longer. "Supply chain executives have to be aware of the 'bigger picture,'" says Little. "And while they don't necessarily have to become experts at everything, they have to at least see how their part fits into the rest of their own companies, and with their suppliers and customers."

Little sees executive education—be it via a degree or a certificate program or a workshop—as a good way for supply chain managers to gain more of that big-picturing thinking and then use it in their own careers. When a warehouse manager learns exactly how his or her activities affect distribution, manufacturing and transportation, for example, the opportunities to gain efficiencies and make continuous improvements across the organization grow exponentially.

But as Tracey pointed out, organizations that want to experience those improvements must be willing to carry the executive education torch, or else employees won't see its value. But that doesn't mean enterprising executives can't use the education to improve their own knowledge banks and skillsets while enhancing their chances of getting a raise, a promotion or a new job. "If you're going to invest the money, time and effort in executive education, make sure you do your own return on investment (ROI) calculations," Tracey advises. "No education is bad; it's always good. As with anything, there is a trade off between time and money invested in the payback you get out of the education." ∞∞



Universities and Educational Institutions

Arizona State University

W.P. Carey School of Business

480-965-7579

<https://wpcarey.asu.edu/>

The curriculum for the supply chain certificate is in-depth and driven by best practices and industry benchmarks. Delivered by faculty who teach in our W. P. Carey supply chain programs, including our Master of Science in Global Logistics (MS-GL), the certificate consists of two core courses and your choice of elective tracks, each offering two additional courses. Customize your certificate with a specialization in operation management, supply management, or logistics management.

Auburn University

The Harbert College of Business

334-844-2460

www.auburn.edu

The Harbert College of Business is establishing a SCM research and resource center to facilitate industry engagement. Key capabilities include: conducting annual studies, creating and executing customized development programs, facilitating internship and employment opportunities for students, and driving thought leadership through cutting-edge research.

Bellevue University

800-756-7920

www.bellevue.edu

Bellevue University's in-class and online Master of Business Administration (MBA) places special emphasis on building and practicing the performance skills necessary to achieve measurable success. Leaders with strong decision-making skills who are able to apply learned business concepts effectively are in high demand. This demand is not partial to any particular industry. Bellevue University consults with an advisory board consisting of business leaders with industry insight into trends and needs of the rapidly evolving workplace.

Brigham Young University

801-422-5367

Marriott School

<http://marriottschool.byu.edu>

The global supply chain management coursework prepares students for positions in purchasing and supply management, inventory management, logistics/transportation management, and operations management. Career paths also lead to executive-level positions such as chief supply chain officer, chief purchasing officer, chief logistics officer, and chief operations officer. Since many supply chains are becoming global, there are particularly

good opportunities for individuals with international exposure or interest in working for multinational firms.

Central Michigan University

College of Business Administration

989-774-4000

www.cmich.edu

The MBA program at CMU is designed to prepare graduate business students for leadership positions in today's global economy. The program features an active student learning environment with a curriculum that meets the needs of both part-time and full-time students from all over the world. The online MBA degree offers the same content and coursework as the traditional classroom based MBA. CMU's Online MBA program is also AACSB accredited and requires the GMAT examination for admission. The university offers an MBA in Logistics Management, with courses only available online. Most MBA course work is available online through CMU's Global Campus (see www.global.cmich.edu).

Cranfield University

School of Management

+44 (0)1234 751122

www.cranfieldmsc.biz/log

Full-time MSc in Logistics and Supply Chain Management
Whether you are already a professional in this field or looking to move into this area, this course provides you with the specialist knowledge and skills to further your career. The program was established over 28 years ago and is accredited by The Chartered Institute of Procurement and Supply and The Chartered Institute of Logistics and Transport.

Elmhurst College

630-279-4100

www.elmhurst.edu/scm

Elmhurst College offers an M.S. in Supply Chain Management. The school's SCM program builds on its extensive experience as the only local provider of an undergraduate program in logistics and supply chain management. It also draws on Elmhurst College's location at the geographic center of one of the world's great transportation hubs.

In this program, students gain a sound technical foundation and hone skills that are critical for today's professional: communication, negotiation, team building, information technology, analytical thinking, working in diverse business environments, and sound business decision making. This is a 22-course, 21-month program that incorporates classroom instruction one evening per week.

Georgia Institute of Technology
Executive Master's in International Logistics (EMIL)
 404-894-3808
<http://www.emil.gatech.edu/>

Engineered solutions for optimal results. Gain a global perspective through international immersion and extensive industry engagement. Experience our Global campus yet never miss a beat at work. Take advantage of the opportunity to impact the curriculum. Grow your network with other supply chain leaders while you transform your outlook.

Georgia Institute of Technology
The Supply Chain Leader Development Program
Supply Chain & Logistics Institute
 404-894-2600
www.gatech.edu

The Supply Chain Leader Development Program is a consortium-based certificate program that provides a comprehensive and holistic focus on capability development along multiple dimensions needed to drive supply chain leadership excellence—strategic thinking, operational excellence, business leadership, and application competency. It is a four-course certificate developed to provide participants with both a solid cross-domain understanding of supply chain as well as an opportunity to go deeper in specific domains or techniques of interest. The flexibility of the certificate allows participants to broaden their skills and knowledge base while also achieving a specific noteworthy career accomplishment – obtaining a Georgia Tech Professional Education Certificate. Each course can be applied towards earning a Supply Chain Management Certificate. There are two core courses which are required and then participants choose two electives.

Upcoming executive education courses at Supply Chain & Logistics Institute:

Lean Inbound Logistics (Savannah, GA), Feb 15-16

Supply Chain Project Management: Effectively Managing Transformation Projects, Feb 21-23

Inventory Planning and Management, March 15-17

Golden Gate University
 415-442-7800
www.ggu.edu

For those who don't need an MBA degree but do need to update and broaden their professional skills, the graduate Global Supply Chain Management (GSCM) Certificate provides the theories and practices to be successful in this critical area of modern business. Students take two core operations management (OP) courses, two elective OP courses, and two other elective courses, as approved by the program director for a total of 18 units. The two core OP courses cover key strategic, design, tactical, and execution management knowledge. The two elective OP courses allow students to tailor their certificate in GSCM. The two other elective courses allow students to broaden their knowledge either in GSCM or in related areas such as marketing, finance, technology, project management, and international

business. In addition to academic knowledge, students will have the opportunity to create a career plan to accomplish their goals with the support of academic, industry, and alumni advisors.

Illinois Institute of Technology
Industrial Technology and Management
 312-567-3650
www.intm.iit.edu

The Industrial Technology and Management Program (INTM) at IIT offers a specialization in Supply Chain Management (SCM) at the undergraduate and graduate levels. The SCM specialization is for students with experience or interest in supply chain activities including transportation and logistics, warehousing, distribution, purchasing/procurement, and export/import management. Supply Chain topics are taught by faculty with professional experience in inventory management, sourcing, sales and operations planning, global transportation systems, and sustainable supply chains.

Indiana University
Kelley School of Business
 812-855-8100
<https://kelley.iu.edu/>

If your work involves purchasing, manufacturing, transportation, or consulting—take your career further with a Master of Science in Global Supply Chain Management. Complete your degree in one to five years. With the ultimate flexibility of Kelley Direct you can advance your education around your schedule. This 30-credit-hour graduate degree program offers the skills you need to be an effective manager who understands the business processes critical to the modern-day supply chain of information and material, and how to use technology to manage that flow.

Loyola University Chicago
Quinlan School of Business
 312-915-6574
www.luc.edu

Supply chain management involves the complex challenges of moving goods globally—on time and on budget—to ensure they arrive when and where they should. The Master of Science in Supply Chain Management (MSSCM) program focuses on the major areas of the industry, such as purchasing, transportation, logistics, distribution, and warehousing. Whether you are a career changer or a veteran in the industry, our curriculum will help you become a leader in the supply chain community. Quinlan's program is the only one offered by an accredited business school in Illinois.

Massachusetts Institute of Technology (MIT)
MIT Center for Transportation & Logistics
 617-324-6564
scm.mit.edu

Today's companies are realizing the importance of the supply chain as a revenue generator. It's not just a cost of doing business. In order to remain competitive in the global

marketplace, senior executives must completely transform their business approach and conventional supply chain practices, and embrace new capabilities that drive more value. How can you leverage the latest supply chain tools, practices, and capabilities to ensure that your company is poised to adapt in this rapidly changing environment and not be left behind? You can start by learning from the best at MIT. Upcoming executive education courses include Supply Chain Executive Education, which will be held January 17-20, 2017 at the MIT Center for Transportation and Logistics.

Michigan State University
Eli Broad College of Business
517-355-8377

<http://supplychain.broad.msu.edu/>

The Master of Science in Supply Chain Management (MSSCM) degree is a unique graduate program providing specific deeper knowledge of supply chain practices and technologies in a structure that allows it to be completed while students are working full time. Firms are interested in individuals who have sound business skills, decision-making capabilities, and a solid understanding of the latest technology applications. In supply chain, the search widens for professionals who understand business alignment and value creation, who are aware of social and environmental responsibility, and who value risk management. MSU Supply Chain graduates understand real-world strategies and have been taught the tactics employed by leading practitioners around the world.

North Carolina State University
Supply Chain Resource Cooperative
Poole College of Management
919-513-4488

www.mgt.ncsu.edu

Today's supply chain management industry requires professionals who can integrate and optimize all the steps required to produce the right amount of the right product or service and deliver it to the end user at the right time. The interdisciplinary role of supply chain management spans logistics, distribution, purchasing, manufacturing, inventory management, marketing, and product development. It involves diverse skills and knowledge, along with multicultural and global perspectives.

Northeastern University
D'Amore-McKim School of Business
617-373-2000

www.damore-mckim.northeastern.edu/

The Supply Chain Management program benefits include: Develop an integrative management approach critical in supporting supply chain cost and service improvements. Learn how different supply chain practices, strategies, and decisions can converge to tackle domestic and global supply chain challenges. Acquire an understanding of contemporary challenges, international trade, and development issues that affect the design of international supply chain systems. Gain

valuable insights from professors who are thought leaders in the field. Apply the course credits acquired through the Certificate toward the Online MBA, pending admittance into the program.

Northwestern University
Kellogg School of Management
847-467-7000

www.kellogg.northwestern.edu/execed

Taught by leading authorities on management, strategy, marketing, and decision sciences, Supply Chain Management: Strategy and Planning for Effective Operations offers an interdisciplinary approach to managing supply chains and leading effective operations. Faculty present state-of-the-art models and real-world case studies on managing facilities, inventories, transportation, information, outsourcing, strategic partnering, and more. You will learn effective strategies for managing logistics and operating complex networks. You'll develop new skills for integrating your supply chain into a coordinated system. You'll gain practical tools for increasing service levels and reducing costs. And you'll be inspired to redesign your operations for peak performance.

The Ohio State University
Fisher College of Business
614-292-0331

<http://fisher.osu.edu/centers/scm/executive-education>

The Supply Chain Management Program focuses on how to implement The Global Supply Chain Forum framework. The framework is comprised of eight essential cross-functional, cross-firm business processes. Examples are provided on how they have been implemented by major corporations. These processes must be applied cross-functionally and with key customers and suppliers in order to create the maximum value for customers, shareholders, and other stakeholders. The seminar includes a session on the GSCF partnership model that is being used to structure more than 100 business relationships, including Coke and Cargill, and Wendy's and Tyson, which was the basis for a Harvard Business Review article. Also there is a session on the collaboration framework that is being used by restaurant chain Bob Evans Farms (and other companies) to realize the value of collaboration in real tangible terms.

Penn State University
Smeal College of Business
814-863-0448

www.smeal.psu.edu/psep

The Supply Chain Management Concentration enables you to accommodate organizational and supply chain goals for profitability, asset utilization, customer service, and systems flexibility. Upcoming events at the Executive Center, University Park Campus include Building a Sustainable Supply Chain: Practical Tools for Reducing Cost and Risk, May 9, 2017.

Rutgers University**Rutgers Business School**
973-353-5185**www.business.rutgers.edu/scmms**

Supply Chain networks are constantly evolving, expanding, and becoming more complicated. Globalization, product proliferation, super competitors, mergers & acquisitions, outsourcing, and sophisticated new technology have all raised the dependence and inter-dependence of organizations across a supply chain on one another. In response to this new age of complexity, more attention is being placed on building resilient organizations. Learn why the ability to bounce back from disruptive events with minimum disruption to operational effectiveness is critical to your organization's success.

Saint Louis University**John Cook School of Business**
314-977-3800**<http://business.slu.edu/>**

The John Cook School of Business Center for Supply Chain Management trains and educates on the various tools and activities of the supply chain (supplier relationships, purchasing management, operations and inventory management, logistics and transportation, quality measurement, and information technology) through programs, events, publications, and interacting with corporate supply chain professionals. The Center for Supply Chain Management Systems provides management training seminars on the best practice application within the global supply chain management field to improve the financial performance of organizations; actively supports academic and curriculum development in the area of global supply chain management for the area colleges and universities; and engages in advanced research on application tools in the supply chain management field.

Stanford University**Graduate School of Business**
650-723-3341**www.gsb.stanford.edu/exed**

How can you coordinate and control a supply chain that spans continents? When does outsourcing make sense? How can you leverage emerging economies to accelerate product development? And how can you ensure customer happiness? Questions like these require thinking beyond logistics and cost trimming. Questions like these need a big picture, global approach—the kind taught in Strategies and Leadership in Supply Chains.

Syracuse University**Whitman School of Management**
315-443-3751**www.whitman.syr.edu/scm**

Supply chain managers very often hold the key to corporate profitability. Economists and employers single out supply chain management for its strong growth potential. Home to

the nation's first supply chain program (established in 1919), the school's Supply Chain Management program is well attuned to the needs of this dynamic specialty. Whitman offers an undergraduate degree program and an MBA degree program in Supply Chain Management.

Texas A&M University**Mays Business School**
979-845-1216**mays.tamu.edu/supply-chain-consortium/**

Mays Business School's supply chain group is comparable in size and stature to the nation's most prestigious supply chain programs. We recognize that engaging the corporate community in mutually beneficial partnerships will be critical to our continued growth and success. Toward that end, we formed the Texas A&M Supply Chain Consortium.

The World Academy**855-496-8394****www.theworldacademy.com**

Topics covered in classes and workshops include all phases of Import/Export logistics and compliance including hazardous materials (HAZMAT), letters of credit, harmonized tariff schedules, INCOTERMS, and other topics needed to compete in today's global trade arena, such as customer service, sales, and sales management classes. A full list of webinars and workshops can be found on the Academy's website.

The University of Alabama**College of Continuing Studies**
Tuscaloosa, AL**205-348-6222****<http://training.ua.edu/supplychain/>**

The Supply Chain and Logistics Certificate Program centers on the fact that inventories are the largest single asset for many organizations. This investment must be vigorously managed. If the managers who have responsibility for overseeing these critical resources have state-of-the-art information and techniques, they can save an organization time, money, and make a positive impact on customer service and the bottom line.

The University of Alabama — Bama By Distance**Manderson Graduate School of Business**
(205) 348-0089 or 800-467-0227**<http://bamabydistance.ua.edu/>**

When you earn your degree online from The University of Alabama, you do more than earn a degree. You join a worldwide network of alumni who do more than graduate — they lead. Through the online Master of Science in Operations Management, you will learn from the same professors who teach on campus and develop skills in analytical decision-making and business operations. A decision analytics track is also available for students interested in SAS/SPSS.

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University of Arkansas**Sam M. Walton College of Business****479-575-5949****www.waltoncollege.uark.edu**

Graduates of the Supply Chain Management (SCM) program will find themselves in exciting and diverse roles in organizations where they will manage activities, such as planning and forecasting, purchasing, sales, transportation, storage, and distribution, which are required for the efficient flow of goods and services between the points of their creation and their ultimate consumption or disposition. Beyond faculty expertise in these areas, our students benefit from the College's Supply Chain Management Research Center, which connects students to industry executives leading to job opportunities, internships, or other support.

University of Denver**Daniels College of Business****303-871-3416****<http://daniels.du.edu/>**

The Supply Chain Roundtable at the University of Denver's Daniels College of Business has welcomed well-known executives from throughout the Rocky Mountain region and around the country. The Supply Chain Roundtable gives Daniels students an opportunity to meet with top professionals through our speaker series, networking events, out-of-classroom projects, and internships while giving speakers a chance to meet the students and market their companies.

University of Maryland**R.H. Smith College of Business****301-405-3063****www.rhsmith.umd.edu**

The Supply Chain Management Center is dedicated to conducting research and education designed to further the discipline of supply chain management. The Center operates under a single strategic vision for supply chain management: the collaborative, real-time, end-to-end, risk-tolerant supply chain.

University of Michigan**Ross School of Business****734-763-1396****<http://michiganross.umich.edu/programs/master-of-supply-chain-management>**

Students in our Ross School's Master of Supply Chain Management Program (MSCM), learn from Ross' world-renowned faculty in operations and management science, as well as top-ranked researchers in all business disciplines.

University of Michigan**Tauber Institute for Global Operation****734-647-1333****www.tauber.umich.edu**

The Tauber Institute for Global Operations is a premier multidisciplinary operations program of the University of Michigan. Its mission is to be the recognized leader in operations through knowledge generation, innovative education, and impacting practice. A top-ranked business and engineering school, it offers students a cross-learning environment covering operations management and related areas, thereby deepening their knowledge and preparation to solve problems leaders face.

University of Minnesota**Carlson School of Management****612-625-0027****<https://carlsonschool.umn.edu/>**

Carlson Executive Education helps leaders, teams, divisions, and organizations step-up and thrive in today's "new normal." Focused on transformation and partnership, the school offers accelerated custom programs or "open" programs that build networks and feature peer-to-peer collaboration. Its programs are infused with action learning, industry executives, networking opportunities, and tools/frameworks to apply immediately at work. The school also offers a number of Certificates of General Management Excellence and Certificates of Distinguished Leadership and Business Administration.

Upcoming programs of interest to supply chain professionals include:

Leading Business Analytics
January 18-20 & February 17, 2017

Carlson Advanced Leadership Program
Mondays: March 6- April 24

University of San Diego**School of Business****619-260-4860****www.sandiego.edu/business**

The flexible online format of the University of San Diego's Master in Supply Chain Management program allows students to learn at their own pace and still work regular hours. This means students can immediately apply every new innovative strategy they learn directly to their jobs. Classes are web-based and students get face-to-face time with faculty and classmates during the university's five on-campus interactive sessions. Students also have access to the school's Supply Chain Management Institute, where they can further their professional development by attending workshops that expose them to the latest trends in areas like transportation strategies, strategic sourcing, and risk management.

Supply Chain Management Institute**619-260-4894****<http://www.sandiego.edu/business/centers-of-excellence/supply-chain-management-institute/>**

Helping achieve more cohesive Supply Chain Management business acumen among students, faculty, and industry, The Supply Chain Management Institute in the School of

Business Administration is wholly invested in supporting SBA's mission to develop more globally minded, responsible leaders. It regularly researches and updates the curriculum and creates advanced learning opportunities to help students gain relevant supply chain management knowledge that is aligned with industry needs.

University of San Francisco

415-422-5555

www.usanfranonline.com/ism

With companies trying to cut expenses, operate more efficiently, and reduce their environmental footprint, sustainability and supply chain management (SCM) have become critical fields worldwide. Gain cutting-edge skills from U.S. News-ranked University of San Francisco, as renowned instructors guide you toward a three-course Advanced Professional Supply Chain Management Certificate through the convenience of video-based e-learning.

University of Southern California

USC Marshall School of Business

213-740-9000

<https://www.marshall.usc.edu/dscm>

The Optimization and Supply Chain Management Program is offered by the Marshall School of Business in partnership with the Viterbi School of Engineering. The program offers individuals opportunities to expand their knowledge of the rapidly expanding uses of technology in the management of global supply chains. The program focuses on teaching the necessary knowledge and skills in areas like product introduction; strategic procurement; outsourcing; logistics and distribution; information technology and its role in managing global supply chains; and supply chain optimization. The certificate may be completed on either a full- or part-time basis. Most classes applicable to the program are offered during both daytime and evening hours. Many of the ISE courses included in the curricula are available online.

University of Tennessee

College of Business Administration

865-974-5001

<http://supplychain.utk.edu>

For more than 50 years, University of Tennessee faculty have played a major role in the supply chain arena, conducting innovative research, publishing leading-edge findings, writing industry-standard textbooks, and creating the manual to which companies successful in supply chain management adhere. We offer comprehensive supply chain management/logistics programming across the entire educational spectrum, as well as customized solutions to fit your specific needs.

University of Washington

Department of Civil & Environmental Engineering

206-221-6407

www.supply-chain-transportation.uw.edu/overview/courses/

The Master of Supply Chain Transportation and Logistics degree is designed to give students a solid foundation in the core competencies of transportation and logistics as it relates to supply chain management. The two practicums provide graduates with the opportunity to apply the knowledge they have acquired to a specific, contemporary business problem that they define. Students must successfully complete seven required courses and two practicums, for a total of 43 credits. Students are expected to complete the program within 24 months.

University of Washington

Supply Chain Transportation and Logistics

Master's Program

206-221-6407

<http://www.supply-chain-transportation.uw.edu/>

The online Master of Supply Chain Transportation & Logistics program focuses on the complex challenges that face industry professionals today. The program delivers advanced skills and best practices in a variety of disciplines, including finance, sustainability, and performance management. The program is grounded in quantitative principles and emphasizes using data to inform decision-making. The curriculum features a balance of engineering and business courses.

University of Wisconsin-Madison

Grainger Center

608-262-1550

<http://bus.wisc.edu/centers/grainger-center-for-supply-chain-management>

The Grainger Center for Supply Chain Management has been developing supply chain leaders in an academic-industry partnership since being founded in 1991 by the Grainger Foundation of Lake Forest, Illinois. Grainger Center students acquire deep expertise as the result of interdisciplinary curriculum, renowned faculty, and the learning opportunities experienced through interaction with supply chain executives.

University of Wisconsin-Superior

Center for Continuing Education

715-394-8101

www.uwsuper.edu

The Center for Continuing Education is committed to the "Wisconsin Idea," which provides access to university resources for citizens of all ages within the college's community. It has partnerships with schools, government, business, foundations and non-profit organizations, and provides access to an array of learning options. With several program areas for credit or non-credit, and dozens of certificate programs, the university provides the education to advance in your current career, or explore new paths in life.

Walden University**1-866-492-5336****www.waldenu.edu**

Seminar in Global Supply Chain Management- as globalization integrates all regions of the planet, business has become multinational and multimodal. Regardless of the role—manufacturers, retailers, or service providers—doing business globally requires a thorough understanding of how products, services, and information products develop from ideas to deliverables. In studying global supply chain management, students learn about the systems required to identify sources of people and material as well as ways to ensure that the supply chain conforms to the highest expected business standards anywhere in the world. Students investigate potential opportunities for new research in the field and share their findings through a presentation.

Washington University- St Louis**Olin Business School****314-935-9494****https://olin.wustl.edu/**

The Master of Science in Supply Chain Management (MSSCM) degree at Washington University's Olin Business School equips graduates to stand out in this exciting career field.

This STEM (Science, Technology, Engineering, and Mathematics) designated program brings together industry collaboration and faculty renowned for their work in risk management and supply chain research to create one of the most sought-after supply chain management degrees in the nation. The MSSCM program consists of 36 hours graduate-level course credit, typically completed in three semesters. Working professionals in the St. Louis area can pursue the program on a part-time basis, and begin taking classes in the fall or spring semester.

**PROFESSIONAL ASSOCIATIONS****APICS****1-800-444-2742****www.apics.org**

APICS is the leading professional association for supply chain and operations management and the premier provider of research, education, and certification programs that elevate supply chain excellence, innovation, and resilience. APICS Certified in Production and Inventory Management (CPIM) and APICS Certified Supply Chain Professional (CSCP) designations set the industry standard.

ASQ American Society for Quality**800-248-1946****www.asq.org**

ASQ certification is a formal recognition by ASQ that an individual has demonstrated a proficiency within, and comprehension of, a specific body of knowledge. Nearly 250,000 certifications have been issued to dedicated professionals worldwide. ASQ's certifications include the Certified Supplier Quality Professional and the Manager of Quality/Organizational Excellence. The organization also provides training courses for quality professionals of all experience and skill levels.

CSCMP**(Council of Supply Chain Management Professionals)****630-574-0985****http://cscmp.org/**

The Council of Supply Chain Management Professionals (CSCMP) provides you and your organization with the education, research, connections, and professional growth

you need to meet the demands of a constantly changing marketplace. Our member benefits are designed for supply chain professionals passionate about their careers and the supply chain profession. Council of Supply Chain Management Professionals members receive practical, "how to" solutions on the industry's current hot topics from receiving member exclusives such as publications, professional education, online benefits, networking opportunities, and cutting-edge research.

ISM**(Institute for Supply Management)****480-752-6276****http://www.ism.ws/**

With more than 48,000 active members worldwide, ISM is the largest global organization dedicated to advancing the practice of procurement and supply management. ISM is the leader in supply chain, driving value to its members with its two widely renowned certifications, the Report On Business®, countless educational resources, and extensive networking events around the globe.

Next Level Purchasing Association**412-294-1990****http://www.nextlevelpurchasing.com/**

The Next Level Purchasing Association can help transform you from an average buyer to a procurement superstar. As the official source of prestigious SPSM® Certification, we can provide you with the procurement training and certification you need to rank among the most valued procurement professionals on the planet.

NITL
(National Industrial Transportation League)

703-524-5011
<http://www.nitl.org/>

Career advancement, meeting new challenges, and taking advantage of the latest opportunities and trends require today's freight transportation professional to be up to date on the latest developments. The League has a proven track record of providing educational forums, which meet all these needs. From seminars on critical emerging issues, to webinars on best practices in every aspect of supply chain management, the League's constantly evolving education program for Members is an industry leader

SIG
(The Original Executive Sourcing Network)

904-310-9560
www.sig.org

SIG Global Summits are three-day events that are packed with the latest best practices, cost-cutting strategies, innovative processes, and risk-mitigation approaches. Through CPO roundtables, general sessions, workshops, breakout sessions, and networking events, you'll hear from industry thought leaders, discover the latest best practices, and have the opportunity to network with like-minded professionals facing similar challenges. Events planned include:

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The current and future value of benchmarking

Supply chain functions use benchmarking for decision-making, but can do more to track its impact.

By **Becky Partida, APQC**

Becky Partida is senior research specialist – supply chain management, APQC

Benchmarking is a well-known tool for comparing the performance and practices of a business entity against those of others. Successfully implementing benchmarking can result in benefits for an organization, including:

- facilitating comparisons across business units;
- accelerating restructuring and change;
- encouraging innovation;
- enabling objective comparisons; and
- improving productivity and quality.

Although benchmarking presents the opportunity to obtain rich and beneficial information, organizations may not be making full use of this tool. To better understand how organizations are using benchmarking and the results of their efforts, APQC conducted a survey of 319 respondents representing a variety of industries and organizational functions. Nearly 19% of those survey respondents indicated that their roles are within a supply chain function, which APQC defined as the logistics, operations, supply chain planning, manufacturing and procurement functions of an organization.

APQC then compared the benchmarking practices of supply chain functions against the practices of all other types of organizational functions. The results indicate that supply chain functions have integrated benchmarking into their decision-making and improvement efforts more so than other functions but they have room for improvement when it comes to identifying the financial impact of benchmarking and involving more employees.

A formal structure

The results from APQC's survey show that supply chain functions are more likely to have some formal structure for their benchmarking efforts. Nearly half of respondents from other organizational functions indicated that they do not have a

formal benchmarking structure, whereas 39% of respondents from supply chain functions indicated this to be the case. Of those supply chain respondents that do have a formal structure, the largest group (21.6%) has a part-time structure with a combination of centralized and decentralized efforts.

These results indicate that supply chain functions are making benchmarking enough of a priority to create a formal structure for it. However, perhaps in an effort to maintain focus on their primary responsibilities, they do not want to devote resources to benchmarking full-time.

Benchmarking in the culture

APQC's survey results also indicate that supply chain functions tend to make benchmarking an integral part of their culture rather than an ad hoc effort. Respondents were asked to rate how much they agree with several statements about benchmarking and their organizational culture. As shown in Figure 1, more respondents from supply chain functions indicated that they agree or highly agree that benchmarking is ingrained in how their organizations conduct business and manage performance. This group of respondents also agrees that benchmarking is expected when their organizations build a business case or conduct improvement projects and that benchmarking is an intrinsic component of organizational decision making.

Accordingly, fewer of these respondents agree or highly agree that benchmarking within their organizations is only conducted on an ad-hoc basis for specific projects. These results seem to indicate that supply chain functions recognize the potential benefits of having benchmarking be part of key decision-making points for the organization. This may be because supply chain functions themselves

are often data focused, and they look for ways in which to identify performance and improve processes.

Measuring and reporting impact

APQC’s survey results also indicate that supply chain functions tend to more broadly disseminate the findings of their benchmarking efforts. About 41% of survey respondents from supply chain functions indicated that they make benchmarking findings accessible throughout the entire organization. By comparison, only about 26% of respondents from other functions indicated that they disseminate findings to this degree. The largest group of respondents from other functions (about 31%) indicated that they make benchmarking findings available up to the unit or division level.

These results indicate that many supply chain functions see the value in exposing the entire organization to the results of a benchmarking effort. As with the degree to which benchmarking is part of the culture of supply chain functions, this may be a natural extension of a focus on data as a means of enhancing organizational decision-making. It may also indicate that these functions are more prone to provide their teams with the ability to act on new information revealed through benchmarking.

Where that breaks down for supply chain functions is with the measurement of the financial impact of benchmarking on the organization. More specifically, the financial benefits related to cost savings, improved efficiency and increased productivity. APQC’s survey asked respondents to provide the approximate financial impact resulting from their benchmarking efforts. About 29% of supply chain respondents indicated that their organizations do not measure the financial impact of benchmarking and about 35% of supply chain respondents indicated that they do not know the financial impact. This means that over 63% of these individuals cannot articulate any financial impact of benchmarking for their organizations. This is surprising given the tendency of supply chain functions to track data.

APQC saw similar responses from individuals in other functions. For this group of respondents, about 47% indicated that their organizations do not measure the financial impact of benchmarking and 30% indicated that they do not know the impact. Both supply chain functions and their peers in other functions have room to grow with regard to measuring the impact of benchmarking efforts.

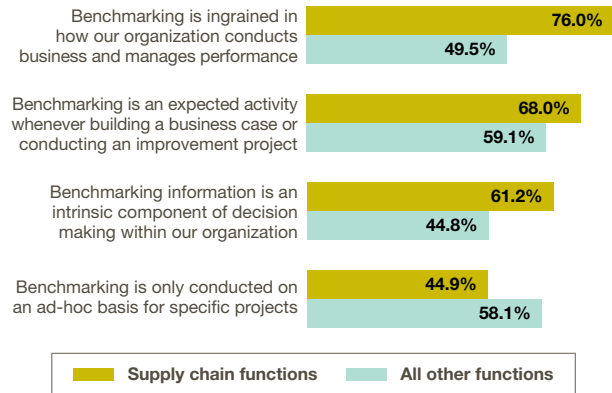
Make measurement and continuity a priority

The results from APQC’s survey on the use of benchmarking indicate that supply chain functions tend to be ahead of other functions with regard to using benchmarking to drive business decisions. These functions also see the value in disseminating the results of their benchmarking efforts beyond the project team level; they recognize that

FIGURE 1

Benchmarking and organizational culture

(Percent agree/highly agree)



Source: APQC

findings can be valuable throughout the organization.

However, supply chain functions have yet to regularly identify and communicate the financial benefits that result from benchmarking projects. It may be that these functions haven’t yet achieved the ability to translate the findings of benchmarking projects into actions with quantifiable results.

APQC’s survey also reveals a further advantage supply chain functions have over others: these functions tend to have employees with more experience in benchmarking activities than their peers. About 41% of supply chain survey respondents have more than 11 years of experience with these activities. However, the next largest group of supply chain respondents (about 29%) have zero to two years of experience. So, while many supply chain functions have engaged certain employees in a great deal of benchmarking activities, there is an opportunity to expose more.

For supply chain organizations that have not yet embraced benchmarking as a regular way of assessing their performance and practices, the results of APQC’s survey provide lessons on what to aim for and pitfalls to avoid. These organizations should take steps to ensure that benchmarking efforts become an integral part of organizational decision-making. ∞∞

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. ∞∞

ANNUAL VIRTUAL CONFERENCE

Digital Evolution:

Streamlining Logistics & Supply Chain Operations

How to put technology, data and collaborative relationships to work to cut costs, optimize processes and gain global visibility.

Supply chains have undergone some significant transformations over the last few years, and 2017 should be yet another evolutionary year for these extremely complex and dynamic supply and demand networks.

Driven by trends like omni-channel fulfillment, changing consumer demands, the need for better risk mitigation, an upswing in e-commerce, and the need to squeeze efficiencies out of every link in the chain, today's logistics and supply chain management professionals are looking for new ways to meet these goals while helping to keep their organizations profitable and successful.

To help readers along this path, the editorial teams at *Supply Chain Management Review* and *Logistics Management* assembled an impressive lineup of supply chain experts for our annual virtual conference that we've titled "Digital Evolution: Streamlining Logistics and Supply Chain Operations."

This online event dives into critical topics such as the evolution of the digital supply chain, the Uberization of freight and the best ways to put technology and partnerships to work to streamline logistics and supply chain operations. Here are just a few high-level points covered during the conference designed to help you achieve your logistics and supply chain goals in 2017 and beyond.

KEYNOTE ADDRESS

The Digital Re-imagination of Supply Chains

Has your organization started down the path toward the nonlinear network?

Speaker: Rich Sherman, Senior Fellow, Supply Chain Centre of Excellence, Tata Consultancy Services Limited

As e-commerce increasingly becomes "connected commerce," with everything from consumer goods to building materials to special chemicals being marketed, bought and sold online by customers who are connected to markets and suppliers, the age of connected commerce has arrived. In this keynote presentation, Rich Sherman explains how it's time to re-imagine the digital supply chain as a customer-centric supply network—enabled by real-time visibility—equipped with end-to-end data and advanced analytics.

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In his address, Sherman discusses "future-ready" supply chains and how companies are re-imagining the way they approach today's digital business environment. "At the end of the day, we've been digitizing business processes for 40 years now," says Sherman. "Every year, we see new advances in technology and computing power." According to Sherman, a recent TCS and University of Texas at Arlington survey that focused on Big Data analytics, the Internet of Things (IoT), mobile devices, and Cloud and pervasive computing



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uncovered some interesting points. For starters, digital technologies are making traditional supply chains obsolete due to the fact that the latter is inflexible, subject to delays and unable to use all available knowledge.

“Digital supply and demand network models, on the other hand, are adaptive; non-linear; offer omni-directional, real-time response; and support omni-channel fulfillment,” Sherman adds. Pointing out that “change is inevitable,” Sherman wraps up his keynote by urging companies to *seize* the opportunity to participate in the connected business environment... rather than hiding from it. “Change is inevitable,” says Sherman, “growth is optional.”

CONFERENCE SESSIONS

Transportation: *The “Uberization” of Freight*

Speaker: Steve Banker, VP, Supply Chain Management, ARC Advisory Group

Implementing an “Uber-style” service for moving freight has piqued the interest of tech-savvy logistics professionals who want to cut costs and increase shipment flexibility. Much like the individuals who turn to Uber for its ride-sharing capabilities, companies of all sizes are borrowing a page from the successful company’s playbook and implementing their own Uber-style services.

In this session, ARC’s Steve Banker puts the “Uberization of freight” into context and discusses how the concept applies to the modern-day supply chain. He describes the ride-sharing concept as a “very easy to use app on a smartphone” that allows users to hail a ride very quickly and easily. “The venture capitalists are crazy over this and the possibilities for the freight market,” says Banker, “but in logistics terms, this is a non-asset based model, and we have a long way to go to see how it applies—if at all.”

Asked about the biggest advantage to using the Uber-model in the freight transportation world, Banker pointed to better visibility and improved asset utilization as two of the biggest wins. “Trucks and other modes of transportation won’t be driving around empty as much, which is by far could be one of the biggest potential wins.”

Digital Characteristics of the Gartner Top 25 Supply Chains

Speaker: Michael Burkett, Distinguished Research VP, Gartner

While the list of digital characteristics of the modern-day supply chain may change from year to year, there are some commonalities that separate the best from the rest. In this session, Gartner’s Michael Burkett focuses on the digital initiatives being applied by some of the most innovative supply chain practitioners in the world as they transform their operations to handle the new digital world.

Burkett starts the session by detailing how companies are truly *aligning* with their supply chains and applying digital strategies in

those chains. He shares a detailed slide based on a Gartner study of C-level executives, who were asked: What do you think the term digital business means to your organization? “The leaders start by understanding what digital actually *means* and then aligning it across their businesses,” says Burkett, “and that translates into a digital strategy.”

Global Logistics: *Supply Chain Disruption and Risk Mitigation*

Speaker: Beth Pride, President, BPE Global

If the 2016 Hanjin Shipping crisis was any indication, risk is a fact of life for global logistics and supply chain professionals. And in today’s increasingly global business environment, new areas of exposure can literally appear overnight. In this session, BPE Global’s Beth Pride explores how shippers can work toward mitigating the increasing threats facing their ever-stretched global supply chains.

Pride says that the Hanjin debacle proved just how quickly and unexpectedly shippers can find themselves dealing with new areas of exposure and risk in today’s business environment. “There are all kinds of threats to the supply chain,” Pride says, “from natural disasters to political upheavals to business failures.”

She offers the following best practices to global shippers looking to avoid supply chain disruptions and mitigate risks: Understand the risk of your global supply chain operations; take an active role in quantifying the risks and the cost of mitigation strategies; automate and continuously measure high-risk operations; focus on all global locations; and “turn trade compliance into a strategic initiative.”

3PL/Freight Forwarders: *Creating Collaborative Partnerships*

Speaker: Cathy Morrow Roberson, President, Logistics Trends & Insights

In today’s highly-connected digital business environment, a company’s ability to create collaborative business partnerships can make or break its supply chain. In this session, Cathy Morrow Roberson defines the changing global environment that spurred the M&A frenzy in the 3PL market and examines the wide variety of new technology services being offered. She also provides a checklist that logistics professionals can use to find the best possible collaborators or “partners” in the current landscape.

To set the stage, Roberson defines the global environment with one word: uncertainty. Looking to the period between 2008 and 2020, she notes the key changes in the business environment over that time and the projected growth that could be in the cards over the next few years. These changes have resulted in an extremely fragmented 3PL and freight forwarding market. To meet the needs of the changing market, Roberson says companies must find supply chain partners that can grow and adapt right along with them. ☺



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*World Shipping Council - Survey Results for Containers Lost at Sea - 2014 Update.

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