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Are you responsible?

I f you're a long-time reader of *Supply Chain Management Review*, you're familiar with Larry Lapide's "Insights" column. Typically, Larry is writing about the many facets of planning, but occasionally, he takes on a provocative topic. One year, he questioned whether it was necessary to be a Top 25 supply chain leader, especially if in your industry, good enough gets the job done.

In this issue, he offers a provocative take on whether supply chains should be, in his words, "responsible" versus sustainable—think green. The topic was thought provoking enough to make responsible our cover line. We're pairing Larry's article with another thought provoking offering from Helen Eckmann, an associate professor at Brandman University. I first met Helen at an ISM conference a couple of years ago, where she posed a number of ethical dilemmas to a panel of senior supply chain managers and asked: "What would you do?" For this issue, she has turned that panel discussion into a series of stirring questions for readers that get to the heart of a responsible supply chain.

And, because we focus on supply chain education every July, we offer a column from Robert Lieb, a frequent contributor to *Supply Chain Management Review* and a professor at Northeastern University, about the future of supply chain management education programs. In Lieb's view, we need to take care to preserve these programs that are vital to training the next generation of supply chain professionals.

We're excited to lead off our features with a Q&A with Shawn Curran, Gap Inc.'s supply chain leader. In the interview, Curran discusses both the evolution of his career and the Gap's supply chain since he joined the company in 1988— just three years out of college. In the past 31 years, Curran has risen from the engineering ranks to manage responsibilities that stretch from new product development to store operations. I think you'll agree that his story is an indicator of where leading supply chains—and supply chain managers—are going in the future.

**Bob Trebilcock,
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We're also profiling the winners of our first annual NextGen Supply Chain awards, which were sponsored by IDC. We introduced the awards at our NextGen Supply Chain conference in Chicago in April. This year's winners are leading the way in the adoption of new technologies. And, if your organization has completed an award-winning project, we hope you'll apply for the 2020 awards later this summer.

Finally, we've updated last year's listing of the supply chain certification programs offered by academic institutions and professional associations in North America. It remains one of our most read articles.

As always, I look forward to hearing from you with any comments or suggestions for future stories in *SCMR*.

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Advocating for "responsible" supply chains

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

L ast year, at an advisory board meeting of the Manufacturing Leadership Council (manufacturingleadershipcouncil.com) we discussed renaming one of the major critical issues it addresses: manufacturing 4.0 sustainability. Now, sustainability is a broad topic including social responsibility and environmental consciousness, and so we kicked around some terms that might be used instead. Someone suggested "ethical" supply chains, to which I responded that the term ethical may imply judgment because it is about being right versus wrong and good versus bad. I preferred "responsible" supply chains instead. Why?

"Responsible" over "ethical"

Ethical is defined as an adjective "pertaining to or dealing with morals or the principles of morality; pertaining to right and wrong in conduct." Responsible, meanwhile, means "answerable or accountable, as for something within one's power, control, or management." I believe the latter is more appropriate for business decisions, because the law dictates what businesses are legal (i.e., good) versus illegal (i.e., bad).

My first two "Insights" columns back in 2007* dealt with the fact that oil prices were starting to rise, and thus, putting at risk the benefits garnered from supply chain practices that were put in place during the era of cheap oil. Because oil and other carbon-based energy sources are non-renewal, I advised that oil be squeezed out of existing supply chains, such as by slowing them down. The rationale I offered was primarily to alleviate increasing costs, and to a secondary degree to reduce carbon-emissions detrimental to the environment. Managers could easily convince their executive team to reduce costs, but were less likely to convince them to reduce oil consumption only for environmental reasons.

Since then, whenever I've depicted a traditional picture of the supply chain, it starts upstream with a picture of the earth because all supply chains use the earth's air, land and water to manufacture goods and operate services. I often point out that supply chain managers (taken aback by my statement) irreparably alter the earth and are partially responsible for detrimental effects. Does this make the profession "bad" from an environmentally conscious perspective?

I don't believe so because we can run our supply chains responsibly in the most cost- and asset-efficient way. As the enablers of growth in global trade over the past several decades, we've played an important role in making the world a better place for humans to inhabit. Worldwide poverty has been declining, according to the World Bank, as well as illiteracy, disease and deadly violence. This makes us "good." Thus, we act responsibly because we balance the various benefits and costs, as well as assess the good and the bad impacts to help make decisions that are best on the whole.

Another socially conscious issue of concern that I've also previously addressed is the industry's decades long over-outsourcing of manufacturing operations. However, I do not view this as an ethical issue. Thus, I titled my Insights column: "Advocate for responsible outsourcing."** That column discussed the various factors that led to over-outsourcing. These included: An over-focus on serving shareholders, executive greed and the lack of thorough analyses to support outsourcing

decisions. For example, many companies just looked to source from low labor-cost countries. I identified that the most blatant factor left out was the idea of justice. I stated: "Companies, like people, … owe national debts…. A multi-national company that has successfully built a business in a country should not favor foreign residents over domestic ones." At least one well-known tech executive also believes in this idea.

High-tech execs vary on national debts

On 2/26/19, the website neowin.net reported "that over 100 Microsoft employees signed a letter addressed to CEO Satya Nadella and President Brad Smith complaining about the company's $480 million contract with the U.S. military to develop an Integrated Visual Augmentation System (IVAS), which also includes HoloLens. The document primarily revolved around an ethical debate regarding Microsoft offering technology that could potentially be used to increase to hurt and kill people."

In a statement to CNN, Mr. Nadella defended his decision to honor the contract: "We made a principled decision that we're not going to withhold technology from institutions that we have elected in democracies to protect the freedoms we enjoy. We were very transparent about that decision and we'll continue to have that dialogue [with employees]. It's not about taking arbitrary action by a single company, it's not about 50 people or 100 people or even 100,000 people in a company. It's really about being a responsible corporate citizen in a democracy."

Note Mr. Nadella's use of the adjective responsible, in contrast to the employees who signed the letter and viewed the decision as an ethical one—of being good versus bad. A global business ought not to be making ethics-based decisions, at least not decisions that are predicated on employee opinions of what is right and wrong. In the long run, such a business could evolve to only marketing and selling products for so-called ethical customers using only ethical suppliers. Meanwhile, responsible competitors could eventually win out by focusing on all potential customers and trading partners.

Not all high-tech companies believe they owe a national debt. In June 2018, Business Insider reported that "facing both public pressure and unrest from within its own company, Google will not renew its contract to help build artificial intelligence tools for the military." Apparently, working with the military casts doubt on "Google's old motto: Don't be evil." Did Google forget that it has benefitted greatly from the Internet's World Wide Web, which evolved from research initiatives funded by the Defense Advanced Research Projects Agency (DARPA)?

Responsible also avoids bad consequences

In some of my "Insights" columns, I've discussed situations in which companies took actions that led to bad but unintended (yet significantly likely and predictable) consequences. A responsible supply chain should anticipate and avoid these from happening. In one column***, I advised supply chain managers to argue against company actions that might lead to outcomes that would be detrimental to a company's brand image. A few examples follow.

1. Amazon made a faux pas when it first added same-day delivery for a portion of its Prime customers. It added free same-day delivery for certain zip codes, apparently where sales volumes were cost-effective. Unfortunately, the strategy came across as discriminatory after "an analysis of the zip codes eligible for Amazon.com's premium, same-day delivery service revealed that the company doesn't serve black neighborhoods in several major U.S. cities as well as it does white ones." While unintended, Prime's minority customers were effectively subsidizing its affluent ones.

2. During the 2013 holiday season, too many retailers promised next-day delivery on on-line orders taken as late as the day before Christmas Eve. An unfortunate series of events led to a lot of presents being delivered after Christmas. The major parcel carriers were dubbed the "Grinches that stole Christmas." Parcel package carriers' supply chain organizations took the brunt of the fallout.

3. Circa 2013, around 1,000 impoverished apparel workers in Bangladesh died in the collapse of a garment factory building and over 100 died at two garment factory fires. The world was in an uproar over the industry's working conditions and safety, and blamed Western retailers that used the factories to manufacture their private-label products. While the retailers were not directly responsible for the tragedies, they could have prevented them if they had ensured that their supply network partners complied with well-known manufacturing safety and working-condition standards.

I encourage managers to focus on operating responsible supply chains, not ones based on so-called dogmatic ethical opinions. Being socially conscious and environmentally friendly are, of course, considerations. However, they are not practical considerations without balancing them among other "good, bad and ugly" aspects of global supply chains. ∞

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*"Is your supply chain addicted to oil?" Supply Chain Management Review, Jan/Feb 2007; and "The link between oil and supply chain design," Supply Chain Management Review, March 2007.
**"Advocate for responsible outsourcing," Supply Chain Management Review, Nov 2017
***"Defend the company brand, too," Supply Chain Management Review, Nov 2016

Ethics BY HELEN ECKMANN

What would you do?

When it comes to running a supply chain, we all like to think we'd do the responsible thing when confronted with an ethical dilemma. But, would we?

Helen Eckmann is an associate professor in the School of Business and Professional Studies at Brandman University, where she teaches supply chain ethics and leadership. She has also consulted in ethics, strategy, innovation and sustainability with Fortune 100 and 500 companies as well as the military. She can be reached at Heckmann@Brandman.edu

The supply chain is like a river that runs through our world. In some organizations the supply chain is visible and almost tangible. In these organizations it appears that each person knows how and where his or her job fits into the supply chain, where the materials or processes came from and where his or her work goes next. In such organizations, even large ones like the military, you can almost see the whole supply chain functioning.

In other organizations the supply chain is more diffuse or obscure. Processes and products are functional and connect from and to each other. However, not all employees of the organization are aware of why they do what they do or how that connects further in the organization. Sometimes in these organizations timelines are still met, but time is often wasted.

Sometimes organizations become so focused on the how and what of their supply chain they forget to make the why front of mind for their employees. Compliance is critical in the supply chain, even more so in some industries like those with government contracts or pharmaceutical manufacturers. However, ethics is even higher up the food chain than compliance. Ethics is embedded in our own values and the values of the organization—ethics is the way of what we do. It is possible to be compliant and not ethical and those who enforce compliance may sometimes come to a place where they still don't know what to do next.

Most organizations have a clear set of compliance rules for employees to follow, however rarely do we find individuals inside or outside of the supply chain that have a clear and concise understanding of what ethics means to them professionally. Following are five scenarios that intersect with compliance and ethics. Think for a moment about each of these scenarios and what you would do. What is expedient? What would you tell your young son or daughter (niece, nephew, mentee) to do if it was their first job?

Scenario #1: Speak up?

You are the project manager responsible for designing and shipping a new product in the paper industry. This is currently your only project and you are behind schedule and over budget. You have just received the latest test results and the data indicate that the product has marginal (.001 over acceptable range) results for quality. It is your job to determine if the product is ready to ship. What would you do? You know of others in your company who have lost their jobs for not shipping product on time. You also know that customer complaints about quality cause the CEO to rage.

A. What would you do?
B. What is the expedient thing to do?
C. What would you tell your son or daughter if it were their first big project with a new company or position?

Scenario # 2: Attractive candidates

You are the new hiring manager and you are working on your first assignment to fill an important internal position. You meet with the hiring authority, who is best described as an "old school guy." He is loud and vocal and very successful within the organization. He lets you know through not so subtle hints that attractive women make the best employees. You remind him of the law and company standards, and he responds; "Yes, just don't waste my time sending me people I will not hire." Going through resumes and the initial interviews you have some great candidates, both male and

female. Do you forward the men? When you interviewed some of the women you found one or two who were highly qualified but do not meet your boss's standards for attractiveness.

 A. *What would you do?*
 B. *What is the expedient thing to do?*
 C. *What would you tell your son or daughter if it were their first big project with a new company or position?*

Scenario #3: Friends in high places

A well-respected Ph.D. scientist moved to San Diego from Boston 18 months ago for a high paying biotech job; she is the main bread winner in her family. Her husband and two daughters did not want to leave Boston. Seven months ago, she was laid off and was not able to find a job. Given the economy, and increasingly fewer National Institute of Health grants, she is worried as she watches her family go deeper and deeper in debt to maintain their La Jolla lifestyle. A few weeks ago, she was offered an excellent-paying local job, as CTO with a medium-sized privately held defense contractor. She has a long-term friendship with her new boss, the CFO, who tells her business is guaranteed: The CEO is a boyhood friend of a congressman who is well taken care of by the CEO. What should she do?

 A. *What would you do?*
 B. *What is the expedient thing to do?*
 C. *What would you tell your son or daughter if it were their first big project with a new company or position?*

Scenario #4; Big boss error

You work for a large OEM. You normally work remote but were asked to come in and work from the company headquarters. You have been with the company for six months, and other than working at Starbucks this is your first real job. You were pleased to get this lower level job in the compliance department because at least you could now move out of your parents' basement. During the week you can work at the desk of the head of compliance as she is traveling for an international supplier contract. You take your own laptop and try to leave as small of a footprint as possible. On Thursday you were deep in thought and a co-worker loudly entered the office and your arm swung around and a pile of papers fell from the boss's desk. As you were putting them back in order you could see that she had some confidential files that are mandated to be under lock and key. What do you do?

 A. *Contact the big boss and ask her if she wants you to secure the documents?*
 B. *Just put them back in the stack and pretend you did not see anything.*
 C. *Contact the head of human resources and ask them what to do?*

No easy answers

Running a LEAN supply chain is hard work. Being ethical is just as hard. As we navigate our careers through the supply chain, we are often confronted with ethical dilemmas like those above that may or may not be covered by compliance standards. Ethical issues can include contracts with suppliers, treatment of employees and fairness with customers.

Ethical failures for both individuals and organizations occur. We remember the devastating decisions that were made by Bernie Madoff and Elizabeth Holmes, or the impossible financial standards that were set for Wells Fargo employees and the cascade of unethical behaviors that followed, hurting customers and the bank's reputation.

Most of us want to be ethical and in compliance, but in times of vulnerability, conflict or confusion often decisions that are not ethical seem like the only choice. (And who isn't sometimes vulnerable or conflicted?)

Ethics, however, is not logic; it is telling the tangible truth and doing what is right even at a possible cost.

So, as you think about the scenarios just presented, ask yourself: What would you do?

Achieving gender-balanced teams starts at the top

By Katie Date

Efforts to encourage more women to become supply chain practitioners and correct the gender imbalance that has long plagued the profession are starting to bear fruit. However, there is one area where progress is lacking: The leadership level.

Research indicates that gender-balanced enterprises tend to be more productive and innovative. Also, female supply chain leaders provide role models who can inspire women to enter the profession and climb the career ladder.

Katie Date is the manager of corporate and SCALE network outreach at the MIT Center for Transportation and Logistics. She leads the MIT CTL Women in Supply Chain Initiative, which is exploring ways to address gender challenges in supply chain management through education and outreach initiatives targeted at mid-career supply chain professionals. She can be contacted at Datecl@mit.edu.

How can the supply chain management function entice more women to join its leadership ranks?

This was one of the questions discussed at the *Women in Supply Chain Summit: Achieving Balance in SCM* this past March in Boston. The event was organized by the MIT CTL Women in Supply Chain Initiative and hosted by lifestyle footwear and apparel brand Converse. The female practitioners who participated in the event provided some innovative approaches to changing the complexion of supply chain's upper echelon.

Progress—but not at the top

The 2019 AWESOME/Gartner Women in Supply Chain survey* summary reports a modest improvement in gender diversity in supply chain management. Women currently make up 39% of the supply chain workforce on average, according to the survey results. Gartner surveyed 165 supply chain professionals and their companies' goals to improve gender diversity.

However, the story is less encouraging at the senior managerial level. The number of female executive leaders has declined from 11% to 14% over the last two years; a sobering result observes the report.

There are several possible reasons for the decline. Some executives have retired, while others have been promoted to the C-suite or moved laterally within organizations. A challenge is how to replace the Baby Boomer generation of leaders with women from the Generation X and Millennial cohorts. The former is smaller than the Baby Boomer group while the Millennial generation is not supplying candidates for senior management positions fast enough, the report maintains.

The hope is that an observed uptick in the number of VP-level female managers this year will fill the executive leadership gap over the next few years. However, such an outcome is by no means assured.

Corporate gender strategies

Meanwhile, there are various strategies that companies—and individuals—can put into practice to increase female representation at the senior level in supply chain management. Here are some examples from Women in Supply Chain Summit attendees who have gained first-hand experience of the challenge.

Grow the talent pool. Companies at the summit reported that recruiting women at the leadership level is particularly challenging because the pool of potential candidates tends to be relatively small.

Accelerated leadership programs for women can enlarge the pool. At one company, all four women in such a program attained senior vice president status in 10 years. Another company launched a Career Central platform that focuses on career development by, for example, offering courses geared to the advancement of female professionals. These offerings include sessions on self-reflection for individuals who need to clarify their career paths, guidance on how to articulate career goals and make course adjustments when necessary and tips on how to build the experience and knowledge needed to advance up the career ladder.

HR and supply chain leaders need to work together to help develop leaders. Several senior supply chain practitioners at the summit complained that all too often females are not included on the slate of candidates for high-level positions.

The good news is that as more women fill senior positions, the cycle of recruitment becomes self-reinforcing because the presence of females

in the upper echelons of management encourages more women to aspire to these roles.

Let leaders lead the way. Women who rise through the leadership ranks can take on campaigner roles such as career mentoring, sponsoring and coaching to encourage junior females to tread the same path. It's essential that these senior-level women understand the difference between the roles. A mentor uses her knowledge and expertise to provide guidance. Sponsors actively champion a person's career development, whereas a coach seeks to nurture individuals by helping them to dig deep and find answers to career issues.

Some companies have established formal and informal programs that provide opportunities for executives to fulfill these roles. Structured programs can include clearly defined features such as quarterly milestones and measurable outcomes for mentors and mentees. There is also reverse mentoring where junior employees mentor senior executives (on technology issues, for example).

Each role requires a specific set of skills and level of commitment. For example, best practices for mentors include committing to regular meetings and ensuring that interactions with mentees are meaningful and not just informal chats. The best mentors are "connection managers" and not merely cheerleaders. They connect mentees to the next phase in their careers.

It's also important to appreciate that participating in these types of programs can benefit the executives involved as well as the aspiring female executives. A panelist at the summit noted that senior managers who were good coaches tended to be better leaders. Moreover, her company required that mid-level managers had to have taken at least one coaching course to be considered for promotion to higher positions.

Women who have succeeded in scaling the managerial heights can also be potent catalysts for change. In addition to providing role models for junior professionals, these executives can have a considerable influence on hiring practices. In one company at the summit, the global percentage of female hires increased by 35%, and women now represent 45% of the team, mainly due to the impact of one woman. The goal was to match the gender diversity of the country in which the team was located, particularly at the executive level, where females occupied 25% to 35% of the high-level positions.

Strike a balance in the workplace. The chances are that female leaders shoulder domestic responsibilities such as rearing children in addition to highly demanding management roles. Achieving the right work/life balance by, for example, clearly delineating "offline" time facilitates the retention of female executives.

However, it might be necessary to reframe "work/life balance" as "work/life integration" for the next generation of women leaders. The traditional concept of a balanced life implies that there is an adversarial relationship between the workplace and the home, which may be outdated. A successful career can be part of a fulfilling life, and exposing kids to a mother's career demands can ease the tension

between the office and the home. Moreover, girls that become familiar with their mother's leadership roles are likely to be less intimidated by the prospect of following a similar path.

Develop appropriate hiring practices. The way companies hire individuals for senior positions can hamper female candidates. A summit speaker pointed to the inappropriate wording of job descriptions as a potential obstacle to female candidates. For example, a spec that asks for "a supply chain ninja" can serve to deter female applicants. Asking the same questions in the same order when interviewing candidates helps to avoid unconscious bias in the recruitment process. Also, female participation in the hiring process increases the success rate of women applicants.

A personal mission, too

While companies can do much to encourage more women to take on the leadership mantle, individuals should play their part as well. Career-minded women need to take the time to clarify their priorities so they can effectively advocate for themselves, advised a summit presenter. Early in her career, she took on roles by default, not by design because her goals were not clear. Yet every career decision has a consequence.

Such clarity is especially important for women who stereotypically find it challenging to advocate for themselves. Moreover, they also have a propensity for unthinkingly saying "yes" to job opportunities rather than being forthright about their ambitions. A recurrent theme at the summit was the need for female professionals to overcome their gender's lack of self-confidence. Women tend to focus on the 20% of skills they lack rather than the 80% they possess—and in many instances the skills at which they excel. This tendency hinders women's rise through the managerial ranks both on a day-to-day basis and during job interviews. A more confident demeanor helps women to compete successfully for promotions.

There are mechanisms for building confidence. An example is advocacy networks; personal networks of female coworkers who support each in other. One company at the summit described a networking circle to which people were nominated. Members of such a network can support each other by, for example, helping to ensure that female colleagues are heard during meetings.

Adding value

A gender-balanced leadership team tends to be a more effective team. Moreover, women bring attributes to the top table that are increasingly valuable in today's competitive environment. Examples include the resilience that comes from having to negotiate a challenging career path and the ability to juggle multiple responsibilities. ∞

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The *SCMR* Interview: Shawn Curran, Gap Inc.

For the past 31 years, Shawn Curran has worked in supply chain management at Gap Inc. He sat down with *Supply Chain Management Review* to discuss his career, the evolution of Gap Inc.'s supply chain and the future of the profession.

BY BOB TREBILCOCK, EDITORIAL DIRECTOR

Gap Inc.

GAP   BANANA REPUBLIC   OLD NAVY   ❀ATHLETA   INTERMIX   HILL CITY⁄

I n July 2016, *SCMR* published "A portrait of the supply chain manager," our look at today's senior level supply chain manager. The article was based on research we conducted with APICS, now known as the Association for Supply Chain Management, or ASCM.

At the time, we wrote that today's senior vice president of supply chain had often taken a circuitous route to the top, and in many cases, had not begun their career in what we think of as supply chain management. He, or she, was most likely at least 48 years old with a bachelor's degree in something other than a formal supply chain program, had worked for three different companies, held at least four different positions before taking the helm and had likely worked for his/her current employer for at least 10 years.

We also described the senior leader as "a life-long learner who is engaged in advancing their career and the profession.

Increasingly, the companies our respondents work for are looking to the supply chain to provide a competitive advantage and gain market share."

While not entirely on point, that description sounds very much like the resume of Shawn Curran, who has spent 31 years working in supply chain management at Gap Inc., including four years at the helm of the retailer's supply chain. Curran's duties are expansive, including everything from sourcing, production, transportation, distribution, engineering and call center operations. More recently, store strategy and operations was added to his portfolio. He is an example of a supply chain executive who has elevated the profession—and Gap Inc.'s supply chain—to the C-suite.

Curran recently took time to discuss his career, including his route to the top at Gap Inc., and the evolution of the retailer's supply chain operations.

SCMR: *Shawn, let's start with the progression of your career.*

CURRAN: Sure. I've been with Gap Inc. for 31 years now, and I've really only worked for two companies since I got out of college in 1985. As I think about it, I was in the field right from the start, and I didn't know it.

SCMR: *I'm guessing you don't have a degree in supply chain management.*

CURRAN: I have a bachelor's degree in mechanical engineering from the University of Dayton. Later, I earned a master's degree at Xavier University in Cincinnati. I set out to be a design engineer, and my first job was working for Texas Instruments as a manufacturing engineer in their defense systems electronics group in Dallas. It was a great job because you worked with design engineers, fabricators, assembly line teams and parts planners so that you really understood the process from end-to-end. Then when you became a design engineer, that experience would help to make you a better engineer. I was referencing that job when I made the comment that I was in supply chain and didn't even know it. I think about supply chain most simply as create, plan, source, make, move, sell and return. Today, we must think of supply chains to be ever more end-to-end, with our tentacles ingrained from the creation of the product all the way to the customer.

SCMR: *What happened next?*

CURRAN: Two things. One is that I began to really become more self-aware of the things that gave me energy, the areas where I felt like I had skill and competency. That's where I began to appreciate the need for mentors, which has been a theme throughout my career. My early manager at Texas Instruments said to me: "You clearly have a lot of energy and you're able to not only think about design engineering, but work and solve problems with teams." So, three years into that first job, I moved into industrial engineering. I believed that by developing my skills in that discipline, I could do more around things that I really enjoyed, like time and motion studies, process engineering, systems engineering, ergonomics and end-to-end S&OP management. I also started to look around at other opportunities when this company called Banana Republic caught my eye. They were looking for an industrial engineer for a new distribution center (DC) they were building in Erlanger, Ky. They were last on my list and I applied on a whim. That was 1988, and here I am 31 years later.

SCMR: *What appealed to you about the job?*

CURRAN: When I interviewed, I saw right away the opportunity to move from an environment where everyone was an engineer to one where I was one of just a few engineers in the company. My job was to develop the materials handling systems, the standard operating procedures (SOPs) and everything related to the time and motion studies aimed at continuously improving operations. It was an opportunity to play a critical role in a young brand.

How will tomorrow's supply chain leaders differ?

CURRAN: As you look to grow future supply chain leaders, the best are going to have a global level of understanding. It's critical for leaders to understand global markets and trade, given everything we're dealing with these days. In transportation, they'll have a broad and deep understanding of all of the modes, including air, rail, ground and trade compliance. They'll understand parcel and last-mile delivery. If you're going to be a transportation professional, you have a mandate to acquire expertise and skill in all of those areas so you have the ability to understand how to most cost effectively operate and deliver service reliability in a turbulent supply chain world.

Tomorrow's leaders will need to understand how the various disciplines should play together and connect. That's essential if you're going to have the speed, flexibility and responsiveness that you need in supply chains today and tomorrow.

They're going to need to understand the next version of the supply chain that will be digital and driven by AI. Supply chains will leverage real-time digital customer insights like never before, enabling us to respond with greater levels of speed and precision. We will have to aggressive act on these insights to create greater value in the way in which we manage our business.

The supply chain leader of tomorrow that I'm looking to pass the reins to will have cross-functional expertise across the various disciplines, will be an avid learner and will be a fearless change agent. That's where the future lies. At Gap Inc., we have purposely tried to create career paths for supply chain leaders to work across functions and geographies.

SCMR: *You started in warehousing?*
CURRAN: Absolutely. It was a time of unprecedented growth under Mickey Drexler's leadership. Banana Republic was shifting from the safari look to something that was more sophisticated and upscale, and that was really taking off. Gap Kids was really taking off. Our job in logistics and warehousing was to try to keep up with the pace of growth.

SCMR: *Did you think of yourself as a supply chain manager then?*
CURRAN: No. Back then, we called it distribution and we were located in Kentucky. Sourcing was located in San Francisco. It was not part of our collective organization. That began to change in the mid-90s, when Old Navy came onto the scene. That was a level of growth unlike anything we'd ever seen before. We doubled as a company every three years to four years into the 2000s. We rebranded our organization from distribution to logistics. That included DC operations, engineering and transportation.

SCMR: *How did you cope with that growth as an organization?*
CURRAN: One way was to outsource transportation. At one point, we started down the path of building our own fleet of trucks, but because we were growing so quickly, we needed more capacity and chose to leverage third-party transportation providers. We also began to contemplate moving from a national distribution model, with a central DC in Kentucky, to a regional distribution model with more DCs around the country. I was not involved in the decision making, but we bought enough land to support growth to a $30 billion company. Thank goodness we did because, over the years, it has advantaged us in such a big way, as we brought our on-line and retail operations together.

SCMR: *Did your role change during this period as well?*
CURRAN: It did. In the 90s, I became a technical services manager. All of the maintenance teams reported to me, as did the industrial engineers around our northern Kentucky network. Then, I had another one of those critical moments where my leader at the time challenged me to move into an operating role. Having worked so hard on my engineering skills, I thought that was career suicide. But, the consistent message I got from my manager and my mentors was that

I needed to continuously learn and grow. I struggled with changing disciplines, but realized these were people who had my best interests in mind and who saw potential in me. So, in the late 1990s, I jumped in with both feet and became an operations manager.

SCMR: *What was the outcome?*
CURRAN: The thing I most enjoyed doing was solving big complex problems with teams. Being in operations humbled me greatly. I learned that it's one thing to design a solution and another to actually execute it, while motivating and training hundreds and hundreds of people and coping with all of the volatility associated with apparel retailing. That was a huge moment of awareness of what it takes to be a leader.

SCMR: *Were you still working in Kentucky?*
CURRAN: Yes. Over the next few years, I was fortunate enough to get roles of increasing responsibility, and ultimately became the senior director of one of the facilities there in northern Kentucky. At the time, we had four facilities in northern Kentucky, but we didn't run our buildings as a leveraged operation. I thought there was a tremendous opportunity for us to view ourselves as one big campus. Even if the buildings operated separately, we could pool our back-office functions together. I talked with my leader at the time, and was given the opportunity to lead that newly formed northern Kentucky campus. During that period, we began to develop a tailored brand level of service to support the individual brands. To do that, we became more integrated with brand leadership teams in San Francisco and created brand director roles within logistics, and in the early 2000s, I became the brand director for Banana Republic.

SCMR: *You were doing this during a period of rapid growth. Did that trajectory change?*

CURRAN: It did. Following 9/11, we realized that the economy was going through a difficult period. There was also a change of leadership then, with Mickey Drexler's departure. We began to pivot our supply chain away from just coping with growth to really focusing on costs. We became extremely competent in driving operational efficiencies and began to better garner the leverage that we had across our brands. We brought logistics and sourcing together in San Francisco. That was a real milestone in the evolution of Gap Inc.'s supply chain. Around 2006, Glenn

On innovation

CURRAN: Gap Inc. is a 50-year-old company, but I like to view us as a startup. We constantly have to make sure that we're challenging ourselves to nourish a culture of test, fail and learn. That's success. That's not failure. We really encourage that. The learning piece—how you act on those—is key. We have pilots going on at a level that I've never seen in our history. The ability to be able to do that across a global organization in a disciplined way, in terms of prioritizing where the resources are deployed, is key for the management teams of tomorrow and for supply chain talent.

Murphy became our CEO and we brought in Colin Funnell as our supply chain leader. Colin had been the senior vice president of production at Old Navy. He further strengthened our cost focus and accelerated change to maximize leverage across our supply chain functions and for all of our enterprise procurement activities.

SCMR: *How did that change your operations?*

CURRAN: We really ramped up our capabilities as a global logistics and global sourcing operation to become much more leveraged in the way that we approached our business and more balanced across the dimensions of service, cost and people. In the late 90s we were singularly brand focused and delivered tailored services to each brand. So, if Gap, Gap Kids, Old Navy and Banana Republic wanted their deliveries at 6:30 a.m., we would send in separate delivery trucks to

each store to give them the specific service requested. Now, we started to look at how we could optimize the way we did this across the brands. In the example I just gave, our outbound transportation team developed store delivery optimization, or SDO. We worked with our brand partners to optimize our deliveries so that our routes to each of these stores are done as efficiently as possible. Next, we looked further upstream to our regional network of distribution campuses. By populating all of the demand for the Midwest or Northeast into a transportation management system, we could maximize the labor, the loading hierarchies and the route efficiency as we dispatched orders out of our regional distribution campuses through our pool providers and onto our stores. That was just our domestic retail operation because online at that time was run by Gap Inc. Direct, or GID. We didn't bring GID into the supply chain organization until 2012 or 2013.

SCMR: *What did your global operations look like?*

CURRAN: Globally, we also began to move from independent, geographically-led sourcing across the brands to category-based sourcing. For instance, we started to source denim across all our brands on a global basis. At that time, some of our international markets were run separately; each country had a managing director with their own reporting lines of accountability for distribution and transportation. Because of that, our processes and the technology used varied across our operations around the globe. We began to bring that in with maniacal focus. That was another milestone for Gap Inc., and for me personally when I was given the opportunity to lead our North American transportation function in 2005. I was able to work with the team to build out the new transportation model that I spoke about earlier. In 2010, I picked up European Logistics as we started to bring some of the international markets under the global logistics umbrella. That gave us the opportunity to drive best practices across all our operations across the globe. Then, in 2012, I had the opportunity to come to San Francisco, where I became the SVP of global logistics. Around that same time, Glenn Murphy recognized the opportunity to integrate GID and our logistics organization into the broader supply chain operations, and our online fulfillment operations came under my responsibility.

CSCMP 2019 edge

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SCMR: *That sounds like a pivotal moment in your career.*

CURRAN: It was in a number of ways. I love to learn, so, I spent a lot of time studying my competition in each of our markets. I wanted to understand the best practices that we could apply to best serve Gap Inc., given where we were in our business. In that 2012 and 2013 time period, we developed a five-year plan with the goal of coming out with a single, end-to-end global supply chain organization in the way we operated. While we were working on that, I was promoted to EVP of supply chain and product operations and continued to pick up additional areas of responsibility. Most recently, we've expanded to include Store Strategy & Operations as part of Global Supply Chain.

SCMR: *Since becoming Gap Inc.'s senior supply chain leader, what have your priorities been?*

CURRAN: One of my maxims is that supply chain principles transcend cultures. So, unless there's a burning business need in a specific market, I believe our practices and systems should be consistent around the world, and we've worked toward that. It is easier said than done in a large global organization. One of my first initiatives was to bring all the global transportation and compliance teams under one leader with one vision for an end-to-end global transportation function, and we have that today. We no longer have duplicative transportation teams or processes.

SCMR: *Can you talk about some of your transportation initiatives?*

CURRAN: One of our priorities was to leverage our capabilities, our technology stacks and our processes at our consolidation freight locations at our origin countries. For instance, we worked with our partners to maximize cube utilization whether we ship by air or by ocean. We have control tower capability across our operations, so that we have visibility at each node along the supply chain. And then we created inland transload operations, what we call ITOs, at every port that we're in. Once we ship across the ocean, we're able to unpack a container very quickly, sort it into 53-foot trailers for greater cube utilization and then maximize the domestic transportation leg from the port all the way to our distribution campuses.

SCMR: *Do you reallocate on the fly?*

CURRAN: Speed and flexibility are key to supply chains today. We constantly monitor demand, and then, working with our partners and logistics organization, we can pivot to wherever we can extract better value. That can happen at the origin location port,

or we can redirect freight when it lands at an ITO at any destination port. If we had originally planned on sending something to our Fresno campus and now we need it in the Northeast, we can quickly resort at the ITO and send it to Fishkill.

SCMR: *What have you done around your fulfillment operations?*

CURRAN: We spent the first 35 years of Gap Inc.'s existence finely tuning our North American retail network model. You could walk into any retail building across North America and see consistent tools and processes. Fast forward to 2013, we had a separate online organization, GID, with its own logistics function. Originally, there were good reasons to do that because it allowed us to be laser focused in building digital capabilities. But, given the rapid growth of e-commerce, that was no longer a winning formula for servicing the customer, and we pride ourselves on being demand-driven and customer-led. So, we began to build global fulfillment capability across all channels concurrent with our transportation initiatives.

SCMR: *What did the network look like then?*

CURRAN: In 2013 when we launched our five-year-plan, we had 19 distribution centers around the world, including our separate online centers. We had a big online fulfillment operation in

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GAP INC.

FOUNDED: 1969

REVENUE: $16.6 billion, fiscal 2018

BRANDS: Gap, Banana Republic, Old Navy, Athleta, Intermix, Hill City and Janie and Jack

NUMBER OF STORES: 3,194 company-operated stores and 472 franchise store locations as of fiscal 2018.

NUMBER OF COUNTRIES SERVED: Gap Inc. products are available for purchase in more than 90 countries worldwide through company-operated stores, franchise stores, and e-commerce sites.

SUPPLY BASE: 28 countries

NUMBER OF FACILITIES: 14 distribution centers worldwide

NUMBER OF EMPLOYEES IN SUPPLY CHAIN: 8,000

NUMBER OF ITEMS SHIPPED PER YEAR: 1.2 billion units globally

Columbus, Ohio; a fulfillment operation with Kiva robots in Phoenix; another fulfillment operation with Kiva in Stafford, England; and a Canadian fulfillment center that also used Kiva. When we ran out of capacity, we'd open popups and they weren't exactly small. In Columbus, we

On technology

CURRAN: When you look at new technologies, you have to get laser focused in understanding how they apply to your world and how to facilitate the implementation of a technology and associated change such that it extracts value for your customer. This is where developing a test, fail, learn, scale mentality is so critical. It is critical for leaders to foster a culture that reinforces this because it becomes contagious and accelerates the pace of innovation.

At Gap Inc., we're looking at two key areas. First is a next generation level of Operational S&OP that is digital in terms of its capabilities and responsiveness. Today, your plan becomes outdated as soon as its created. So, the next generation of S&OP will enable true dynamic planning and execution. The ability at every meaningful point in your operating model to be able to re-plan and pivot to the geography and channel where there is the highest demand, driving toward where the customer is leading you. It's one thing to articulate that; it's far more challenging to look at the legacy practices, systems and culture within your enterprise businesses and advance that capability.

Second is the digitalization of the supply chain—not just at the operating level but from the point of product creation all the way through to the customer. We're looking at some of the new artificial intelligence and machine learning capabilities coming onto the marketplace. Advances in 3D printing, robotics and digital supplier integrations are now moving forward at a rapid pace. We're looking at enhancing our master roadmap using the test, fail, learn and scale methodologies to invest in the capabilities needed to fully digitalize our operating model. There's a lot of excitement around digitalization in the supply chain community, but there is significant work ahead to move from what is, at best, siloed applications of digital tools and processes, to truly end-to-end digital operating capabilities.

once popped up a 300,000 square foot operation for peak. As you're growing, it's not uncommon to do that, but a 300,000 square foot popup is not a sustainable solution. At the same time, we had too much capacity for retail. As we overlaid the vision for our future global fulfillment network, we absolutely saw the mandate to bring together our online and retail fulfillment network into one global fulfillment organization. Now, fast forward five years, and as we sit here today, we have only 14 DCs. By bringing retail and online together, we grew our capacity by 160% while reducing the number of DCs. What's more, we implemented technology that enabled us to keep up with growth while leveling the demand for labor. And, we have consistent materials handling technologies in all our locations, consistent SOPs and we are very much focused on continuing to foster a culture of test, fail, learn and scale.

SCMR: *How did you do that?*

CURRAN: We recognized that we needed technology to solve our capacity problem and to give us the omni-channel capabilities we'd need for tomorrow. My colleagues and I went around the world, visiting different fulfillment operations to study what others were doing. When we got back, Kevin Kuntz, our SVP of global logistics fulfillment, and I worked with some of our materials handling partners and began to pilot some technologies that were new to us. We used our Gallatin, Tennessee campus as our test campus. For instance, we worked with TGW to pilot two aisles of AS/RS shuttle technology. In Europe, the technology is used primarily with totes. We wanted to use it with our standardized cartons, which we spent a lot of time developing back in the 2000s—standardization and vendor compliance was one of the things that allowed us to get maniacal about costs and we didn't want to lose that. Frankly, it took a while to get it to the point where we were confident we could integrate it with the inbound AS/RS cranes we use for storage and scale it across the network. But once we could trust the technology, we developed the solution blueprint and a plan to scale it. The first campus was going to be Fishkill, New York, which is our Northeast distribution center. Then we were going to Canada and so forth through our North American campuses.

SCMR: *What stopped that plan?*

CURRAN: Unfortunately, we had an event that I wouldn't wish on my worst enemy. In August 2016, just a few months before peak, we had a serious fire on the Fishkill campus.

SCMR: *How did you handle that?*

CURRAN: It required us to pivot our U.S. network very differently and very quickly. Almost overnight, we had to move from three regional distribution campuses to two: Gallatin served the Northeast and Fresno ended up servicing the West and Midwest for a period of 18 months to 24 months while we rebuilt the Fishkill facility. Meanwhile, that growth in online demand kept coming at us, so we had to accelerate the implementation of technology in Gallatin, Canada and Fresno. Now, here we are in 2019. The Fishkill facility has been rebuilt, all our North American facilities have the inbound AS/RS crane and shuttle AS/RS technology for order fulfillment and we are rolling out Kindred robotic sortation orbs, or robotic putwalls, in all of those locations as well.

SCMR: *One of the things supply chain leaders drill for is risk management and resilience. With an event like the fire, you had to put that in practice. What was that like?*

CURRAN: It was an unbelievable moment in time for us. Not only in the adversity it brought on us, but as a team, we had to become skilled at managing large-scale change. I had to operate very differently as a leader. Instead of a central control and command, we needed to radically delegate decision making and allow Kevin and my other leaders to just run. We moved at tremendous speed from that moment on in our concurrent implementation of the new operating model and the new technology. Today, what still keeps me up at night is finding the way to continue to scale more in our end-to-end operating model and the way we think about how we run our businesses. That's just today's reality.

SCMR: *Let's talk about your job as a senior supply chain leader.*

CURRAN: My title is executive vice president, Global Supply Chain, Product and Store Operations. This encompasses leading our global sourcing, production, logistics, call center and store operations in service to a growing

On teams

CURRAN: I believe we tend to underestimate our own potential as individuals. The mentors I've had over my career have reinforced this. They consistently said: "Shawn you can do this. What's the worst that can happen? You fail? If so, you're going to learn and grow." I also believe, we generally underestimate the potential of our teams and our responsibility as leaders to reinforce this and help remove barriers. Taking the learnings from the Fishkill fire, I find myself asking team members: "What do you need and how can I help?" I have an eye toward teasing out line of sight to roadblocks—real or perceived. Teams can flourish with clear goals, empowerment and a relentless determination to overcome any and all barriers. When the fire happened, there was no time to hesitate or second-guess. We quickly huddled up, divided and conquered on our plan of attack and unleashed our teams. We divided up our U.S. operations with clear owners who were empowered to move with speed.

The results were amazing. Despite the fire, we delivered significant year-on-year increase in our online throughput during that holiday period, which shocked me. The other lesson to be learned is that we also tend to underestimate the potential of our strategic partners. The night of the fire, I was on the phone with our sourcing offices, our logistics partners around the world and our parcel carriers. Other retailers called and offered to help. It was quite remarkable and reinforced the point that we underestimate the potential around us. If we as leaders can recognize that and enable those capabilities, we would be amazed at what can happen. When I look back on my career that was the most powerful concept I learned.

portfolio of great brands: Gap, Banana Republic, Old Navy, Athleta, Intermix, Hill City and Janie and Jack. Our supply chain team of more than 8,000 employees around the globe serve both online customers and more than 3,000 company-owned stores and over 400 franchise stores. We source over 1.2 billion units annually, in 28 countries and sell merchandise in 90+ countries around the world.

SCMR: *What comes across your desk on a typical day?*

CURRAN: I strive to spend 75% of my time in the strategic space and about 25% in the tactical. From a strategic perspective, it's three tiers of work: long-range planning with business partners; learning and networking; and building talent and capability across our supply chain. I thoroughly enjoy the retail and supply chain space and strive to work with colleagues across the industry to learn and advance our capabilities, I co-chair the Retail Industry Leaders Associations (RILA) and I'm active in Gartner. I spend a lot of time working with our brand teams, sourcing offices, our materials handling supply base and our logistics partner network. I also speak at conferences from time to time. I love this space and welcome the chance to talk shop and understand what's going on in global markets. Lastly, I want to make sure that I'm a change agent within the organization.

SCMR: *That's the strategic side. What about the tactical side?*

CURRAN: My job is to develop leaders who are in service to our customer and driving the day-to-day business consistently delivering on our commitments. I spend that time reviewing performance and supporting and coaching the talent. I spoke earlier about the importance of mentors in my own career. I also believe in removing the roadblocks to getting things done. We did that with the fire in Fishkill, but a fire shouldn't be the impetus to aggressively removing barriers, so I look at how I can do that day in and day out to achieve that same objective. You do that by getting out in front of the teams and understanding what might be coming next. You don't necessarily learn that in school, and it's something that my mentors reinforced with me early in my career.

SCMR: *When you think about the future of supply chain at Gap Inc., how is your role going to be different?*

CURRAN: The supply chain of the future is going to extend far more upstream and downstream than ever before. I've purposely

mentioned the importance of viewing the supply chain from thought bubble—the creation of new products—to customer. At Gap Inc., we strive every day to be demand-driven and customer-led. That's the supply chain of the future. In my role, I really need to be working hand-in-hand with all my business partners across that continuum. We can't integrate new design technologies with our vendors in a vacuum. We have to work more seamlessly than ever with our partners to develop great product that our customers love. The future is digital, and we need to look at our supply chain as being digitally connected in a circular way with the customer at the center. Supply chain leaders of tomorrow need to be expert facilitators of change. That's how my job is going to change going forward.

SCMR: *Finally, what excites you the most about your role going forward?*

CURRAN: It's the ability to win and do it better than our competition. I love learning, I love driving breakthrough change and doing it with teams. The ability to work with a team of best-in-class talent on big audacious problems and challenges in delivering breakthrough results is what excites me every day, and I'm honored to be able to do that at Gap Inc. ⚬⚬

On C-suite support

CURRAN: The evening of the Fishkill fire, I spoke to Art Peck, our CEO, and Bob Fisher, the chairman of our board. It was about 3 a.m. and what I continually heard from both of them was: "What do you need? How can we help? You've got the whole company behind you." The support and trust in senior leadership through this time of crisis was so powerful and gave us the confidence we needed. That was so powerful because of the speed at which we had to move.

There was an important message there around trust, empowering your teams and removing the corporate barriers that don't add value. Since then, our senior leadership team and our board has taken time to visit our sourcing offices and our distribution center operations. They understand that enabling supply chain capability is pivotal to a company's future success.

SUPPLY CHAIN

security starts at home

The key to an effective cyber security strategy may be an unlikely resource: Your talent management strategy.

BY CHRISTOPHER MANGANARO

It's 8:00 a.m. Your receptionist receives a phone call from a vendor asking for details on the next shipment of goods. The receptionist doesn't recognize the voice and asks to which location the goods are going. The caller doesn't have specific information, but explains that his organization is one of your company's third-party logistics (3PL) providers and they'd like to start receiving electronic updates on upcoming shipments so that they can better track inbound goods.

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The day has just started and the receptionist knows that if she doesn't figure this out quickly, there will be more phone calls and her work will pile up. At this point, the receptionist has two options: She can send the details to the 3PL or ask for the caller's contact information and get back to him later. In today's operating environment, we might praise the receptionist for quickly and efficiently providing answers to the caller's questions, including access to information on cloud services, a supplier portal or e-mail list-serve, without interrupting her co-workers or higher-level managers. That's because above all else, we value speed in the supply chain; that relies on the sharing of information on an as-needed basis, at all times, including to our trading partners and service providers. She may even wonder: What's the worst that could happen if I give this 3PL information on deliveries and add them to the company's direct notification process? After all, they're a supplier right?

The simple answer is: Plenty. Opening the doors into supply chain systems to the wrong people can lead to further intrusions into the company's operating processes, schedules and key personnel. With that access, bad actors can degrade the supply chain in the long run. Luckily for the company, the receptionist says she'll have to get back to the caller later. That's because she received training on the "non-cyber" ways that outside entities try to gain access to a company's supply chain systems, and now her antenna is on full alert. Those intrusions can happen directly, by hacking into a company's systems; or indirectly, through an employee who inadvertently provides access with the best of intentions, or, by gaining access to the company's systems via a supplier's or customer's connected systems that are inadequately protected. In this instance, the receptionist knows that she needs to conduct more research before sharing proprietary information that could expose one link in the larger supply chain.

Why would the company train its receptionist in supply chain security? What qualities or personality traits made the receptionist able to withstand a potential attack on the supply chain and able to handle it with confidence? These are questions companies should be asking as they consider their talent management strategy through the lens of their overall cyber security strategy. In other words: Supply chain security starts at home, with your people.

Why talent management?

Talent management allows you to know your people and identify the special skills, abilities and behaviors that can be used to defend your supply chain. That includes all of your people. Until recently, supply chain security was largely perceived as the responsibility of information technology professionals armed with software and systems. The battles all took place in cyberspace. But, as we saw with our receptionist, that is changing. An intrusion may begin with a seemingly innocuous phone call or other interactions with members of your organization. That's why a more comprehensive approach to protecting your supply chain includes training, continued process improvement and other talent management best practices. Passive and active non-cyber talent management principles can reduce exposure and help strengthen the supply chain. These techniques don't require additional employees; rather, they allow you to develop your workforce from within. It is an approach that goes beyond job titles, which are just one element of an individual's identity.

Such an approach has never been more critical. Our supply chains are benefitting from the flattening of the world described by Thomas Friedman's book "The World is Flat." Supply chains that used to run on oil now run on the free flow of information that is being collected in real time at more nodes in the supply chain than ever before. One result is that information has been democratized: Information about inventory, production schedules, customer orders, suppliers, shipments and even prices may be available in some form to any floor level associate with a mobile computer and a barcode scanner. Like our receptionist, almost everyone today interacts at some level with systems of record. That has led one commentator to describe data as the oxygen in today's supply chains: A supply chain, like an individual, may survive a few days without oil, but just try and go a day without oxygen, or to operate a manufacturing plant, distribution center or transportation department without data for even a brief period of time.

One unintended outcome of this new environment is that all of those devices, and anyone with some connectivity to a supply chain system, present an opportunity for exploitation. In fact, your organization's lowest level

employee is a similar risk as your CEO to a supply chain attacks. Remember that hackers have gained access to some company systems through retail point of sale systems and a smart thermostat.

And, let's face it, we've all become accustomed to sharing our personal data online: While Baby Boomers and even GenXers grew up in an era where you didn't provide access to information to someone you have not met face-to-face, Millennials and GenZers are the most connected generations since the invention of the telephone allowed us to make non-face to face interactions. They have grown up in a world where e-mail, blog posts and passive communication is a normal way of life.

For those reasons, the first step to developing a resilient workforce that can withstand supply chain attacks is to identify your employees' talents, as well as their level of risk tolerance, and then find suitable roles for them. That's where a talent management strategy comes into play, one that utilizes a systems-based approach with objective tools, such as surveys, personality tests (Meyers Briggs, DICE, etc.) and in-person training to identify your teams' existing skills, knowledge and behaviors and then employ them in a way that enhances security.

This does not require turning everyone into a supply chain security "specialist" because not every individual on your team will have the attributes required for that position. That is true regardless of their title within the organization. Rather, by identifying the skills of your team members, you can use them to the best advantage in your security strategy.

For example, you may find that someone was on their high school debate team and has a unique gift of persuasion. That could be used with a 3PL that you suspect of sub-contracting for cheaper prices and undercutting your business. Or, you may discover that several employees played sports and understand a team concept, are familiar with pep talks and are accustomed to coming together for a common goal. You can easily develop surveys that ask these types of questions to employ their special talents against specific problems. By doing so, you'll find that a systems approach takes bias out of the process, and levels the playing field in a way that can be used on a wide variety of skill sets from the receptionist to the CEO.

Beyond supply chain

It is key to expand your talent management beyond the personnel directly responsible for the supply chain and IT. Procurement, accounting and human resources all have indirect touches to supply chain operations in ways that could have a direct impact on your operations. Would-be attackers could infiltrate your human resource systems and inadvertently affect the recruitment or selection of your next candidate if their Personal Identifiable Information (PII) is not safeguarded.

PII poses a risk not only in the cyber realm, but also with the physical handling and disposing of outdated information. Top leaders in the company need to focus on looking for individuals who have the abilities to strengthen the supply chain in their own area. However, your talent management search should not interfere or cause favoritism within the organization. A few key ways to reduce favoritism are:

- keep the talent search open and transparent with all members of the organization;
- set a clearly defined start and end date for your talent management assessment; and
- establish regularly scheduled updates to all members of the organization.

Build a defensive mindset

The second step to developing a resilient workforce is building a defensive mindset at every level of the organization. Ask: What will it take to secure the entire supply chain? What areas are the most vulnerable? Is it the receptionist's access to knowledge about delivery schedules, or the procurement department that, by nature, must engage in shared knowledge with other companies to generate and sustain business? The non-cyber threats to your supply chain begin with unrestricted access to your company's information and processes.

The starting point is the identification of the most vulnerable areas of the supply chain and your current processes. Then, develop passive defensive measures as a first layer of security. One example of a passive defensive measure that we all understand is: "If you see something, say something." That slogan was launched in New York City in 2002 following the 9/11 attacks as a reminder to stay vigilant. One simple passive measure

within your organization is to treat the company directory with names, phone numbers and e-mail addresses as "official use only" and limit its distribution. All companies have a management hierarchy that allows the organization to make decisions and produce profit. A would-be attacker could gain access through the multiple layers of people between their target and the information they want. Marking and storing information in specific "close-hold" areas will defend your supply chain from attacks. Marking documents, files and personal information "official use only" helps all employees remain vigilant and maintain a defensive mindset.

> **A "supply chain action team" is the foundation for an active security measure initiative. The team consists of individuals from across your business—not only supply chain—to ensure that you are able to cover any vulnerabilities.**

Like the "see something, say something" campaign, a defensive mindset involves messaging. Within the organization, it's important to identify individuals who have the skills to tell compelling stories both verbally and in print. You might ask: Who on the team is an effective writer? Who has public speaking skills or can get a group to laugh and pay attention? There are instances every day of both cyber and non-cyber attacks on companies that we simply brush off or skip over when reading the news. If you have someone in your organization that is able to pull those occurrences together and apply them to your company, it will build a level of resilience in the organization. From a talent management perspective, passive defensive techniques like these typically require a limited amount of time from people who can normally complete these tasks alone and with little supervision. However, it's important to remember that passive defensive measures require larger buy-in from your organization and need to reach everyone at all levels with the same general message.

The connection revolution

As we noted earlier, we are in a "connection revolution," with greater access to information than ever before and the ability to share it worldwide. Explaining the importance of securing the supply chain is key to stressing its importance without scaring your employees. A few ways to maintain a defensive mindset after the initial launch include:

- add supply chain security to your weekly staff meetings;
- incorporate vignettes into your social media and external communication with customers; and
- incorporate supply chain security into new hire orientation as a way to inculcate the next generation of employees.

Take action

You've conducted a talent management assessment. You've instituted several passive security measures aimed at building a defensive mindset into the organization. However, to truly defend your supply chain, it's time to go on offense with active security measures. This is where large companies enlist the help of entire divisions worth of people and resources to conduct full-time active analysis of their supply chain. That may include an organization's key suppliers, including service providers like a 3PL. However, remember that many 3PL's and manufacturers have small staffs and are themselves vulnerable to attacks without the personnel or resources to commit a full-time team to cyber security. This is where your talent management search will pay off.

A "supply chain action team" is the foundation for an active security measure initiative. The team consists of individuals from across your business—not only supply chain—to ensure that you are able to cover any vulnerabilities. By now, you know which characteristics you are looking for in the team based on your talent management search. Be prepared to form the team on an ad-hoc basis to allow you to set their initial goals and timeframe and adjust personnel if needed. Questions you should consider include: How often do you want them to meet? Is there a designated "leader" of the group or do you let them choose? To whom do they report? How often do they meet and for how long?

You don't have to answer all of these questions when you form the team, but you do need to set boundaries and allow them to operate within them.

> **After your initial deployment, the supply chain action team must conduct a good "after action assessment" to identify any gaps or areas that need additional attention.**

Supply chain security is a marathon and not a sprint. With that mindset, it is important to have your team think about small changes or active measures that they can apply to the supply chain that will have long term impacts. Following are areas to consider.

- The internal security protocols of your sub-contractors, including 3PLs, contract manufacturers and Cloud-computing service providers—even customers to whom you've given access to a supply chain portal or control tower. Start with the largest service providers that handle the largest volume or biggest financial accounts.

- Have your supply chain action team interview your existing 3PLs and service providers to identify where they might have vulnerabilities. (Shipping and receiving, accounts payable, etc.) Any vulnerability can spoil the entire chain.

- Develop a procedure for your supply chain action team to engage with a population of your customers to see where they might have concerns, if any. For instance, the medical supply field has different standards of security than the fruit industry, even though, they are both time sensitive and pose potential risks to your supply chain if it means their products don't make it to the shelves or point of delivery on time.

After your initial deployment, the supply chain action team must conduct a good "after action assessment" to identify any gaps or areas that need additional attention. Here is where you can enlist the support of other members of your staff that are not associated with your supply chain action team. Transparency here is key and

allows all members of your organization to be involved in defending your supply chain. Allow your team to develop their initial feedback on any areas of concern they might have and provide a brief to your organization leaders. This allows everyone to engage in the process without tying up your entire organization on the details.

Following is a format for your supply chain action team to follow to provide a proper security brief to the organization.

1. Introduction. They should describe who the team is and what unique skills, talents and abilities they bring to defending the supply chain.

2. Problem statement. This should be condensed down to simple terms that everyone from shipping/receiving to billing can understand and normally starts with: "How does the supply chain action team protect_____."

3. Desired outcome. What did your team think they were going to accomplish?

4. Actual outcome. What did the team accomplish and what areas were identified for improvement?

5. Next steps. This is where the team can continue with its assigned tasks. At this point, you might assign additional or different associates to the remaining tasks. By doing a thorough talent management scrub of your organization this should be second nature and allow you to call the next person up for the next task.

Protect your bottom line

Securing the supply chain is more complex than downloading the latest anti-virus software or hiring a few security guards to ensure the gates are locked at night. It begins with knowing your people and implementing a talent management strategy that identifies the skills, knowledge and behaviors that will strengthen your supply chain and close any identified gaps.

But, knowing your employees is only the start. Next you need to instill a defensive culture within the organization that starts at the top. Great programs remain viable and long lasting when leaders buy in to the process. Finally, build a supply chain action team to engage in those areas where you have identified weaknesses. Using existing employees and focusing them on a specific task, will lead to long-term effects and develop a different culture within your organization. ∞

S&OP
UNLEASHED

Sales and operations planning is a powerful tool for delivering improved processes and profits. But, that's only part of what makes S&OP work. People (and how they work together) are the secret to unleashing S&OP excellence.

BY JAN STENTOFT, PER VAGN FREYTAG AND SØREN ECKHARDT

Done well, sales and operations planning (S&OP) aligns an organization's assets with the demand for its products. That sounds good, but all too often S&OP efforts come up short in this quest. Despite diligent efforts to succeed, it is not uncommon for companies to struggle with a range of shortcomings, ranging from lengthy time-to-market processes, imbalances between manufacturing and sourcing costs and low capacity utilization, to name just three.

How can that be? The truth is that S&OP is relatively easy to understand but difficult to implement—and not for the reasons most people think.

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At its core, S&OP is all about tearing down silos that have historically allowed departments (sales, production and purchasing) to optimize their piece of the supply chain at the expense of the whole. A highly functional S&OP program changes all of that and aligns key performance indicators (KPIs) across the company. But it doesn't always work out that way, and often KPIs are different than before but no better aligned.

Why is that? The fact is S&OP success is not about process only, or technology. It is just as much about human capital. Unfortunately, the human role in S&OP success is often ignored at worst or overlooked at best.

Given how hard-wired supply chain professionals are to metrics and performance measures, this isn't surprising. But it is limiting. Soft wiring, the behavioral aspects of the design, implementation and operation of S&OP, is the other part of the success equation.

> **Soft wiring, the behavioral aspects of the design, implementation and operation of S&OP, is the other part of the success equation.**

It is time to recognize that human beings execute S&OP processes and KPIs must be balanced by key behavior indicators (KBIs) of both individuals and teams. How everyone behaves and reacts to daily events is just as important to S&OP success as getting the processes right, breaking down the silos and implementing the right tools.

The shortcomings of S&OP

Conventional S&OP is a cross-functional tactical planning process that typically operates with time horizons of three months to two years. The planning is at the product family level instead of the stock-keeping unit level. A standard S&OP process provides the common language between the functions to find and align the equivalents between sales, volumes and budgets. At least, that's how it's supposed to work.

The S&OP process is usually carried out in a monthly cycle consisting of five steps: 1) data collection; 2) demand planning; 3) supply planning; 4) pre-meeting; and 5) S&OP executive meeting.

S&OP should be a company initiative and never just a sales or supply chain or finance project. Unfortunately, S&OP is often mistakenly perceived as supply chain centric. When that happens, there is a lack of holistic understanding and commitment toward S&OP across

the company. Therefore, it is of vital importance that S&OP contains benefits that mutually appeal to sales, operations and finance. These include:

- sales growth (improved on-time-in-full rates, increased customer satisfaction, improved customer service, product launches at the right time, fewer backorders, improved forecast accuracy);
- cost reductions (reduced overtime, material and freight costs, scrap); and
- improved net working capital (lower inventory levels, improved cash flows).

In addition to these benefits, companies create better internal alignment and integration through intensified cross-functional collaboration. The most successful S&OP programs bring sales, supply chain and finance staffs together to balance demand and supply. However, staffs from different departments too frequently continue to focus on different issues. For instance, sales remains concerned with turnover; supply chain with volume; and the CFO with budgets. Instead, all three concerns should be the common concerns of all staffs.

What's more, current S&OP approaches are dominated by several hard-wired factors. These range from planning levels and horizons to technology implementation and performance outcomes. All of that is good if not necessary, but there's more to it. Considerably more attention to human factors is just as essential. Getting there, however, requires a fundamental shift in how companies approach S&OP.

New S&OP management and leadership roles

To begin, there is no single approach to the human side of S&OP. Companies have their own cultures and S&OP has to fit into those to work effectively.

At the highest level, there are three different cultures or societies that dominate companies. As used here, a society is the governance structure that guides management and leadership roles in the organization. The three are: industrial, knowledge and creator.

The first two are well known. They look at people as resources and competencies. Industrial societies tend to focus on what people can do with their arms and

legs. Knowledge societies are more focused on the brains and hearts of people. Industrial societies are hierarchical and rely on formal power that is position dependent. Knowledge societies rely on informal power based on the strength of the argument being made at the time. In other words, power is easily transferred.

The creator society has been recognized more recently in response to recent changes in our overall culture, adding an important dimension to the breadth of governance structures. At its essence, the creator society is a mindset and leadership model that focuses on creating a competitive advantage by unlocking human potential. Rather than being seen as resources and competencies, people are valued for their potential creations. Mutual equality and a changeable power balance are characteristic.

Behind these three societies are three different perspectives on productivity. In the industrial society, resources are scarce and given. Leadership is about providing instructions within a functional context where staff is a resource along with other resources. Designing clear organizational structures underpins efficient division of tasks and use of resources. Efficiency is evaluated through clear measures.

In the knowledge society, employees have deep insights and leadership becomes more of a coaching effort. Organizational structures are constantly adapted or even fundamentally changed to fit the tasks to be solved. A common understanding and

language must be developed to engage employees and help them work together.

That contrasts to the creator society's leadership that shares different roles and perspectives with people all the time. There exists a common understanding that tasks and resources are co-created, often in surplus. It becomes a matter of unleashing potential in mutually trustful interactions using a common language. From an S&OP management and leadership perspective, the three paradigms require different manager to employee relationships.

The effect of additional resources varies markedly in the three paradigms too (Figure 2). In the industrial society, additional resources initially increase returns, but will at some point result in diminishing returns. Still more resources may even lead to marginally lower additional yields. What is required next is new technology—knowledge. That also requires a change in the paradigm to include a stronger focus on soft wiring to climb the yield axis.

FIGURE 1

The three societies

	INDUSTRIAL SOCIETY	KNOWLEDGE SOCIETY	CREATOR SOCIETY
Management/ leadership balance	Management dominated	Leadership dominated	Balanced
Staff perception	Staff as a production function	Staff with hearts and brains	Staff as co-creator based on trust and vulnerability
Resources	Scarce production factor resources	Scarce heart and brain resources	Surplus resources
Manager-employee relationship	Hierarchical	Coaching–employees have the answers	Co-leadership
Language	Instructions	Lack of common language (systems do not play together)	Common language

Source: Authors

FIGURE 2

The effect of additional resources

Source: Authors

In the knowledge paradigm, there is a more linear relationship between resource consumption and yield. The marginal return of adding resources stays the same, depending on new or more relevant knowledge or the lack and/or scarcity of knowledge.

In the creator paradigm, the marginal effect of additional resources—people as creators—may first be low because it takes time for people to get up to speed. However, additional resources—even surplus resources—eventually lead to increased marginal returns.

As can be seen, an effective and efficient S&OP process recognizes the society in place, choosing leadership and management perspectives to match the staff.

Dynamics of individual and team behavior

The next big question is: How do you take that premise and translate it into a template for managing the human side of S&OP processes?

Successful S&OP processes need to identify the KPIs that are linked to a company's overall strategy. Managers must first focus on results, roles and performance by asking: "What should we do?" Future success depends on linking the S&OP process appropriately to corporate strategy and with measurable KPIs. Process steps, formalities and KPIs are the traditional hard wiring of S&OP processes.

> **An effective and efficient S&OP process recognizes the society in place, choosing leadership and management perspectives to match the staff.**

The next step is to encourage future successful behavior by asking: "For future success, what do we actually do?" This allows a company to gain a better understanding of its own behavior. Managers become concerned with how the management and leadership of the S&OP processes can achieve even better results through improved soft wiring of the S&OP process. (See Figure 3.)

In our experience, people don't do what they should do, but do things based on who they are. Behavior depends on personality. To achieve targeted results (KPIs) requires successful behaviors—key

behavior indicators—and that depends on people. KBIs should be formulated positively at both the team and individual level.

We are all well familiar with KPIs. However, KBIs are not as well known. In essence, KBIs describe the behavior needed to achieve KPIs (Figure 3).

At the individual level, consider a salesperson with

KPIs vs. KBIs

Source: Authors

a new KPI to improve forecast accuracy. A potential KBI is more frequent discussions between the salesperson and clients about expected demand for the product. Regular follow up is essential to keep in tune with the customer's expectations of future buying.

At the team level, several KBIs are expected. These include communicating in a proper tone and without interruption, attendance at scheduled meetings, being mentally present in those meetings and following up on what was decided in those meetings.

The Myers-Briggs' Type Indicator (MBTI) based on Carl Jung's seminal work on type psychology helps people to understand each other and meet individual and group KBIs.

MBTI personality theory emphasizes the significance of a distinct type of personality based on self-reported measures instead of traits. Our fundamental belief is that S&OP processes are carried out by people with individual personalities. Thus, theory of personality helps staff to better understand their own and

their colleagues' personalities and behavior. Applying personality analysis/psychological instruments creates a foundation for a constructive dialogue through a common language.

MBTI is a remarkable self-assessment tool where the persons being analyzed select one of two alternatives in a number of questions about how they perceive themselves and their awareness of other things, people or ideas. MBTI operates with four personality preferences on how people behave:

1. *Extraversion-Introversion (EI):* Where does one get and release energy?
2. *Sensing-Intuition (SN):* How does one perceive the world?
3. *Thinking-Feeling (TF):* How does one make decisions?
4. *Judgment-Perception (JP):* How does one adapt to the world?

Everyone is born with these preferences. A total of 16 psychological types are possible and represented by a four-letter abbreviation, ESTJ for instance. The intent is to understand and appreciate differences between people realizing that there is no "best" type.

In a S&OP team process perspective, the two personality preferences of sensing (S) vs. intuition (N) and thinking (T) vs. feeling (F) are of greatest relevance. Focusing on this soft wiring in S&OP processes affords people opportunities to grow on their own terms, in ways that they prefer.

For greatest impact, a KPI paradigm must be supplemented by a KBI emphasis. The result, which the S&OP process must deliver, should be achieved by managing and leading the process so that the KPIs and KBIs are interconnected, which, in turn, depends on the team members. This requires a delicate balance between management and leadership.

Because S&OP is a team effort that grows the business through people, this is where the TeamDiamond tool comes into the picture.

TeamDiamond (Figure 4) consists of four core processes in the work of all teams (need, idea, plan and action). Combine those with the two personality preferences mentioned earlier (sensing (S) vs. intuition (N) and thinking (T) vs. feeling (F)) to get eight team roles in the first column of Figure 5.

TeamDiamond model

Source: Authors

In our efforts to implement and operate S&OP efficiently, we recommend first that each process team member conduct a MBTI analysis that assesses each individual. Then, the team members' personality preferences should be transferred to the TeamDiamond® model to clarify how well the four core processes and eight tactical work processes are covered by the entire S&OP team. That's how Mac Baren Tobacco Company did it.

How Mac Baren capitalizes on people

Denmark's Mac Baren Tobacco Company is the largest family-owned tobacco company in the Nordic region. Supreme quality, proud traditions and committed, enthusiastic staff are hallmarks of Mac Baren. It employs 140 people and exports to more than 80 markets worldwide.

When Mac Baren recently implemented S&OP, it paid particular attention to the behavioral aspects of the implementation as part of a project funded by the Danish Industry Foundation. The company fully integrated MBTI with the project.

For many years, the operations staff at Mac Baren operated from an industrial society paradigm. But that is shifting, according to co-CEOs Jarl Freiesleben and Simon Nielsen. The current focus is on the development of common understanding and language to engage employees and help them work together

FIGURE 5

Mac Baren Tobacco Company

TEAM ROLE	FUNCTIONAL ORIENTATION	CHARACTERISTICS	EXAMPLES OF KBIs	MAC BAREN TOBACCO COMPANY
Need spotter	**F** extrovert	• Establishes social contact • Builds harmonious relations • Identifies urgent needs and information	Contact with stakeholders	**1** person — from sales
Value advocate	**F** introvert	• Focus values and ethics • Defends social justice • Supportive	Monitor customer contact and internal communication in the team	None
Prophet	**N** introvert	• Visionary • Sees opportunities early on • Scenario builder	Provide different solutions to match demand and supply	None
Promoter	**N** extrovert	• Inspires and sells ideas • Brainstorms • Change agent	Motivate the team	**4** persons • **1** senior executive • **2** from sales • **1** from data gathering
Analyst	**T** introvert	• Problematizes and challenges • Analyzes logically • Clarifies and defines	Challenging data, the plan and proposals for decision (the Devil's Advocate)	None
Organizer	**T** extrovert	• Structures and plans • Decides • Takes charge	• Make plans and decisions on time • What is possible and what is not?	**9** persons • **2** from data gathering • **2** from operations • **1** senior executive • **4** from sales
Operator	**S** extrovert	• Keeps things moving • Realistic and practical • Tactical, fast and immediate action	Bring things down to earth Stick to the plan Meeting efficiency	**1** person — from operations
Maintainer	**S** introvert	• Provides continuity • Experience based • Careful about details	• Stick to plans • Follow up on outstanding matters	**5** persons from operations

Source: Adapted from Broegger & Bohnsen (2013) with permission

as part of the S&OP process. To promote more knowledge sharing and development of new creative solutions requires a softening of the industrial paradigm.

As part of the implementation process, all members of the S&OP team completed an individual personality analysis about their behavioral preferences. This process outlined each S&OP team members' MBTI profile and was overlayed on the TeamDiamond tool. Being aware of the team members' preferences provides a sound basis for managing and leading the S&OP process with success.

From this work, KBIs were developed both at a team level and with some specificity between some individual team members. Team KBIs include being a better listener, meeting attendance, following agreed procedures and demonstrating an active and proactive role in the process.

As the final column in Figure 5 shows, certain team roles are highly represented while others not so much. By having this in front of the team, it can work to compensate for the imbalances. Further, the grid advances a structured process for fact-based decisions that all can agree to. This was not always the case previously with some members presenting conflicting data that led to non-value-add discussions.

The grid has also organized KBIs for individual staffers. Beforehand, the salesperson would send an inquiry to the logistician and then follow up without appropriate time to respond. The salesperson is a dynamic, committed and impatient person who prefers to obtain updated information fast. The logistician's personality demands time to think before she answers.

Through a behavioral team exercise, the salesperson has now learned to give the logistician time to read and think about the inquiry before she answers the salesperson.

The salesperson's KBI is to wait until the logistician replies. On the flip side, the logistician now informs the salesperson of the inquiry receipt and when to expect a response.

"We have obtained better communication due to new insights of our colleagues" says Nielsen.

As Mac Baren and other leading companies have shown, organizations must carefully balance their focus on hard wiring and soft wiring of S&OP processes. Typically, human behavior and team performance have been overlooked—but that is starting to change. While procedures and KPIs are important to S&OP processes, KBIs and team performance are just as critical for executing and reaching target goals.

Teams consist of individuals who play different roles, but who also have different personalities. Through hardwiring, the effects of S&OP are measured through KPIs and facilitated by KBIs. The trick is to align both across key departments to avoid contradictory efforts and maximize impact.

To unleash the full potential of the S&OP process, it's all about maximizing the potential of the people involved by recognizing key behavioral indicators. Power to the people. ⚭

> To unleash the full potential of the S&OP process, it's all about maximizing the potential of the people involved by recognizing key behavioral indicators.

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HOW SUPPLY CHAIN OFFICERS CAN DRIVE MARGIN EXPANSION

Given their strategic role in an organization, supply chain leaders can do more to proactively drive change and growth, in addition to leading cost cutting initiatives.

BY GREG DOUGLASS AND VIKRANT VINIAK

C ompanies today face unprecedented disruption across all business functions. Whether it is changing business models, the impact of digital, increased M&A or pressure from activist investors, disruptors are compressing operating margins and are making scalable, profitable growth and consistent competitive agility much harder to achieve. Addressing these challenges and driving margin expansion requires a focus on cost optimization, growth and operating model change. Supply chain leaders are often on the receiving end of these cost reduction programs, or initiate cost optimization activities such as strategic procurement or supply chain optimization. Therefore, it comes as a surprise that supply chain leaders are rarely at the table when organizational leadership is discussing growth or operating model change. Given their strategic role in an organization, how can supply chain leaders do more to proactively drive change and growth, in addition to leading cost-cutting initiatives?

Winning through comprehensive margin expansion

In today's world, shareholders and stakeholders expect winning companies to be growth-led, nimble with their cost base and committed to scalability and trust. Accenture has developed a "Competitive Agility Index" to measure how effectively organizations are executing against these three dimensions. The Agility Index identifies these as leading indicators of performance, given their bearings on top and bottom-line financial results.

Accenture Strategy's 2018 research analyzed over 7,030 companies across 20 sectors and found that more than half (54%) of the companies we examined experienced a material drop in trust at some point during the past two and a half years. A material drop in trust is defined as a drop of 5% or more. The average company that experienced a drop in trust with their strategic partners also saw their Competitive Agility Index score decline by two points. There is a direct negative correlation between the Competitive Agility Index and revenues, meaning that when a company's score drops in the Agility Index, their revenues are at stake. Of the 54% of companies in our sample that experienced a decline in trust, a collective $180 billion (US) in revenues were jeopardized, based on available data, compressing their top-line margin growth.

Given that over half of companies struggle with declining trust and as a result, are eroding significant revenue opportunities, what can organizations do to fortify stronger trust with customers and suppliers? Our experience shows that organizations are building trust through integrated margin expansion strategies, featuring equal emphasis on top- and bottom-line growth, optimized and reduced cost and scalable operating models. Introducing a comprehensive margin expansion program offers a transformative path forward and helps strengthen trust with shareholders and critical stakeholders. (See Figure 1.)

Given the strategic nature of their role and the visibility they have into an organization, supply

Building trust

Source: Accenture

chain leaders should be in the driver's seat of margin expansion programs. In two recent case studies in the high-tech industry, we saw chief supply chain officers (CSCOs) proactively architecting margin expansion programs that dramatically transformed their organizations.

In the first example, a company was experiencing pressure from an activist investor, growth rates were stalled at around 7% to 8% and operating margins were down from 30% to 24%. They requested Accenture Strategy partner with their C-Suite leaders to help return their company to 30% operating margins, without negatively affecting their short and long-term growth trajectories and harming the trust of their shareholders, employees and customers. Our approach focused on preserving the unique and differentiating aspects of their business, and helped them:

- achieve target operating margin;
- deliver accelerated growth;

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- increase sustainable benefits; and
- follow a clear and executable roadmap.

In this success story, the supply chain leader embraced the role of transformation architect, driving both growth and cost reduction, and delivering on commitments to shareholders. As other supply chain leaders consider margin expansion initiatives, best practices suggest that they must continue their leadership of cost optimization efforts, specifically focusing on general and administrative (G&A) cost optimization and third party spend reductions. Supply chain leaders should seek to expand their roles through the use data and analytics, to draw insights for driving growth and sales initiatives, ultimately generating opportunities for operating model evolution. Supply chain leaders also need to get a seat at the table and influence the growth side of margin expansion, in addition to their ownership of cost optimization.

In the second example, a company acquired a division through a partial divestiture from another company. After paying a heavy premium for this strategic acquisition, the organization needed a smooth transition to maintain shareholder trust. Successful integration was predicated on driving down costs, and growth through innovation (new product development and driving solutions faster to the market). The CSCO played a key role in directing the integration.

There are several other examples demonstrating how CSCOs create growth from the forefront while driving margin expansion, which is redefining the traditional CSCO role. Forward-thinking organizations can parlay this into an improved position in the competitive agility index and orient themselves for a successful operating margin expansion. These success stories bespeak how CSCOs are helping companies "win" through comprehensive margin expansion programs. The most impactful margin expansions incorporate three core components; each is outlined in detail below.

G&A cost optimization

The cost component of margin expansion concentrates on using zero-based methodology to reduce labor and non-labor spend in G&A functions. For labor spend, the zero-based approach seeks to determine the right structure, right work

FIGURE 2

The effect of additional resources

Source: Authors

and right size for functions like procurement, finance, HR and IT (see Figure 2). According to "Structural Cost Transformation & Enabling the Growth Strategy Agenda," a 2015 survey from Accenture Research, up to 70% of work activity in some organizations does not contribute to a desired business outcome. Given that cost is a key element of the Competitive Agility Index, a structured approach to G&A optimization is an essential for successfully positioning companies to expand their operating margins. Designing from a "clean sheet," focused on the right structure, right work and right size, allows this non-differentiated work to be eliminated, accelerating the path to significant cost reduction.

Typically, leading companies explore structures like Global Business Services to optimize their labor arbitrage/outsourcing efforts and streamline their internal operations. To highlight the right work, many enterprises leverage automation to eliminate non-value-added activities and drive improved outcomes across end-to-end processes. Robotic Process Automation (RPA) is a common starting point for companies early in their automation journey. Many companies are able to use RPA software to automate repetitive, non-value add work. To right size organizations, companies often seek ways to reduce spans and layers and eliminate organizational complexities from their G&A functions.

In addition to optimizing G&A functions, companies looking to drive margin expansion also focus on reducing spend inefficiencies with third party providers. Spend inefficiencies are commonly identified in cost centers like professional services, facilities, HR, IT, logistics, marketing, packaging, travel, energy, equipment, engineering and construction. A five-step, closed loop methodology provides a framework to drive sustainable reductions in spend (see Figure 3).

Companies can begin by providing transparency around the true cost and efficiency of a company's operations through financial and operational data analysis. Using that data, a company can conduct value-targeting to identify and quantify price, performance and value engineering initiatives to improve efficiency, reduce complexity and reduce costs. After a meaningful list of initiatives has been generated, organizations are encouraged to blueprint and enhance their procurement

FIGURE 3
A five-step, closed loop methodology

Source: Accenture

capability. These enhancements include any necessary organization redesign, process optimization and technology enhancements required to bolster an organization's procurement capability. After blueprinting has been completed, execution of cost-out initiatives begins, and commitments identified earlier in the process begin to catalyze in a measurable way. Finally, tight controls must be developed to monitor the initiatives through a set of KPIs and regular monthly reporting. Leading organizations typically emphasize variances against the annual plan and developing targeted action plans to adjust.

The supply chain officer's role

Supply chain officers are in a unique position to own and drive G&A cost optimization, especially in the Procure-to-Pay (P2P) function. With labor spend optimization, supply chain leaders should be looking for ways to reduce contractor spend, leverage global business services and optimize work placement of the P2P function to maximize labor arbitrage benefits. Supply chain leaders also need to be informed about the benefits and risks of automation for the supply chain organization and the overall corporation.

There is a huge opportunity for automation in supply chain functions—planning, managing shipments, delivery updates to

customers, reschedules and PO creations to name a few. Automating these tasks allows supply chain professionals to focus on value added work, while automating mundane and repetitive tasks. For all discretionary spend, they can help their C-Suite peers fortify stronger partnerships with third party providers, not solely focused on price, but rather the total value impact generated from these partnerships.

Additionally, it is worthwhile to streamline and optimize P2P processes to drive the right-work and evaluate spans and layers across the P2P function to ensure that the organization is right-sized. With non-labor spend, supply chain leaders need to manage third party spend using a closed-loop approach and ensure that their organizations have the right talent, processes and tools required to effectively perform the procurement function. Data is an indispensable foundation to optimizing both labor and non-labor spend.

Supply chain leaders should be regularly analyzing headcount data and spend information to monitor and affect change across the G&A function. Far too often, companies lack visibility to contractor data, employee data and finance data, precluding leadership from understanding a comprehensive headcount picture. This task can be easily owned and managed by supply chain

FIGURE 4
Top-line growth and bottom-line growth

Source: Accenture

leaders as they have teams have existing capabilities in complex analytics and algorithms.

Fueling growth through data and analytics

Data and analytics are also imperative to the growth components of the operating margin equation. Growth has two key mechanisms: top-line growth and bottom-line growth. Top-line growth is focused on unleashing next generation selling motions, removing barriers that slow sales and shifting the performance curve. Bottom-line growth is about reducing cost through optimization of sales spend and winning at the point-of-sale. Accurate, actionable data and insights are essential for improving both top-line growth and bottom-line growth (see Figure 4).

A first step in driving top-line growth is analyzing key metrics for customer segmentation. Analytics can help companies better understand which customers bring value (value creators) and which do not (value distractors). Leading sales organizations tailor selling motions for both value creators and value distractors, especially as it pertains to digital. Typically, they maximize profitability by optimizing investment (discounts, free services and favorable terms and conditions) for these different customer types, and limit churn for the highest value customers. Furthermore, sales reps must be equipped with negotiation enablers (cost to serve analytics, value proposition, negotiation strategies) to drive the desired outcomes and create a comprehensive discounting strategy, including standard deal terms and targeted deployment of discounting dollars. Sales rep compensation should be defined by a customer treatment model to ensure that behavior and incentives are aligned. With role clarity, aligned selling motions and compensation and defined customer treatment, high-performance selling can result in accelerated growth.

Bottom-line growth focuses on charting a course to increased sales effectiveness through improved sales spend ROI and winning at the point-of-sale. Sales spend ROI is generated through the development of the optimal sales team structure and engagement model to drive a more disciplined division of labor between inside sales, direct sales and channel. Furthermore, ROI highlights the importance of aligning compensation to business performance by moving away from unit sales as the driver of performance and towards margin. Leading organizations actively manage a pay-for-performance structure and use analytics to set quotas and reduce overpayments (manual pay, quota management, sales credits). Winning at the point-of-sale happens through increased revenues, sourced from improved negotiations, reducing

cost through limited price erosion and generating value in non-traditional areas like terms and conditions. Addressing sales effectiveness through compensation and winning at the point-of-sale helps companies bolster their position in the competitive agility index and ultimately, drive bottom line growth and margin expansion.

Supply chain officers and growth

Through segmentation, sales leaders are reducing costs associated with servicing value-distracting customers. These savings are being reinvested into value-creating customers and driving greater revenue. Supply chain leaders are integral in cost reduction, as they often have key insights into where costs and non-value-add investments are hidden. They can also adopt a segmented view offering some customers high-value supply chain logistics, operations and delivery, while others receive more streamlined, low-touch and low-cost services. Further, they can also help identify the true cost to service a customer through the product lifecycle. These opportunities can be incorporated into commercial treatments guidance for sales representatives to leverage as they develop competitive offers for customers and prepare for negotiations.

Creating an agile operating model

Companies often make changes to their G&A functions or improve their sales motions, but fail to address underlying structural challenges in their operating models. This creates a situation where benefits can be achieved in the short-term but ultimately erode over time. Durable margin expansion efforts should be tightly coupled with a transformation of a company's operating model. This is fundamental to achieving sustainable profitable growth.

Operating model transformations have two dimensions: intent and blueprint. To assess the intent of an operating model, companies typically look at whether the corporate vision is supported by the structure. Organizations also evaluate if their distinctive business capabilities are being enhanced or eroded, based on their structure. For example, if a company has multiple divisions, are those businesses differentiated and distinct? Are they positioned to support growth via segmentation? Does a company have the right underlying support structure? As G&A costs are being taken out, do new structures like global business services need to be considered? Assessing the intent of the operating model helps to understand whether a company's corporate structure needs to adapt to changes generated by margin expansion activities.

The other part of creating a sustainable operating model

relates to a company's blueprint. In plain terms, this means ensuring that an organization has the right fundamentals to sustain change. Fundamentals include things such as whether an organization has the process discipline to adhere to a new segmentation model or whether a company has the technology enablers needed to drive standardization and optimization of processes. Blueprints also address the placement of right measures and incentives in place to continuously drive behavior that reinforces the goals of either cost optimization or growth. (See Figure 5.)

Supply chain officers and the operating model

Assessing the intent and blueprint of a company's operating model helps to identify where the most impactful transformation opportunities lie. Given the breadth of their roles, supply chain officers have a unique vantage point from which they can evaluate an operating model and make recommendations on how to prioritize transformation needs in support of margin expansion. Supply chain leaders see elements of each business and should be proactively offering perspectives about how to make their company more effective and efficient. This becomes even more relevant for companies that are undergoing an evolution of their operating models. For example, several high-tech companies are now making the pivot from a product model to solutions "as a service." As the business landscape continues to rapidly evolve, supply chain officers need to be alongside their C-Suite peers in determining the right operating model for the company.

Driving growth

With disruption affecting all facets of the enterprise and creating significant trust challenges for companies, the role of chief supply chain officer is more prominent than ever. CSCOs offer an invaluable perspective on the cost reduction and growth initiatives that harbinger successful operating margin expansions. Supply chain leaders are not only focused on the bottom line; but also understand and enable top-line growth.

Their unique visibility to both components of operating margin expansion makes them an indispensable member of the operating committee. CSCOs should not only be consulted, but also included in strategic

Operating model transformations

Source: Accenture

conversations about developing a sustainable operating model. Companies that encourage an elevated role for the chief supply chain officer can translate insight into action, driving down costs, augmenting revenues and subsequently, strengthening trust and generating higher returns for shareholders. ∞

Annie Peabody, a senior manager with Accenture Strategy, contributed to this article.

ORGANIZATIONAL CHANGE
MANAGEMENT AND CULTURE:

Keys to lasting, sustainable cost improvement

New tools—including technology, Lean Six Sigma, continuous improvement, or zero-based principles—require leadership support, rigorous change management, and on-going monitoring to sustain improvements.

BY HARRY HANEY, SHANE McCARTHY, VIKRANT VINIAK, NICK RICHARDSON AND DEAN MYERS

There is no shortage of companies implementing new technologies, overhauling their processes or using tools such as Lean Six Sigma (LSS) and continuous improvement (CI) to gain a competitive edge. Not everyone gets it right—in fact, McKinsey & Co indicate, "the reported failure rate of large-scale change programs in the corporate world has hovered around 70% for many years." What differentiates those who run ahead of the pack and those who end up no better off post-implementation? In our view, it is the change management process that effectively creates a culture that fosters a new way of doing business supported by tools and technology.

After all, tools, technology and processes don't make change—people do. Organizational change management (OCM) is the roadmap that details all of the elements that must be considered and addressed to make the transition successful. The roadmap includes (but is not limited to) such things as the communication plan, potential changes in compensation, recruiting, training and performance evaluation. It considers the impacts on customers and suppliers in addition to other company functions. In the following pages, we'll profile supply chain leaders who successfully implemented supply chain initiatives such as Lean Six Sigma and continuous improvement, and include the lessons learned from their projects.

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Case study: Lawson Products
Continuous improvement

Founded in 1952 and based in Chicago, Lawson Products is a distributor of maintenance and repair supplies servicing customers in all 50 states, Puerto Rico, Canada, Mexico and the Caribbean. About five years ago the culture was characteristic of a company built by entrepreneurs with independent sales agents—lots of non-standard procedures and non-value-added work. The company had been through an attempt to implement Lean processes in the past, but it never gained traction and when it came time to implement a new ERP system, Lean was left behind.

In 2012, a new CEO, Michael DeCata, joined the organization. His background included high-performing organizations where continuous improvement and Lean Six Sigma (CI/LSS) were fully developed. Initially, he supported dedicating a small group of employees to improve

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specific facets of the customer experience such as order fill rates and pricing accuracy. Then he brought all the functions within Lawson Products together and championed CI/LSS. This visible support from the top along with a clearly articulated case communicated to the entire organization paved the way for a solid start to the transformation. He also brought in an experienced consultant to instruct the team in LSS strategy and tactics.

According to Shane McCarthy, senior vice president of Supply Chain and Business Development, the first step was a heavily cross-functional planning exercise to review the needs of the business and suitability for CI/LSS tools. The team went through a prioritization exercise to identify the sequence of projects. Often these exercises simply look at some combination of "size of the prize," perceived difficulty and the time it will take to determine the order in which they should be completed.

Importantly, there is an additional element to consider when starting down the path of continuous improvement. Lawson also considered how a project would contribute to the team's learning of the CI process to build confidence in the new way of working, making the next projects easier and faster. The team ran through multiple groups or "waves" of projects to infuse the tools and terminology throughout the workforce. After a "train the trainer" exercise, by the third wave the team could run projects themselves.

LSS/CI in action

Three projects illustrate how Lawson Products put LSS and CI into action. Let's take a closer look at the projects and their results.

Logistics and transportation: Supplier non-conformance
Problem statement: Defects in inbound shipments, such as late deliveries, missing or wrong items had a negative impact on inventory and added to labor costs.
Action plan: The Lawson team collected shipment receipt data and talked extensively with suppliers to get their feedback. They discovered that suppliers didn't truly understand Lawson's requirements and expectations. Lawson's solution included publishing a comprehensive supply chain guide with their specifications and implementing a supplier scorecard to measure performance. Finally, Lawson convened an all-supplier meeting at its McCook, Ill. distribution center to communicate the changes.
LSS results: A 30% reduction in supplier defects of these types with initial solutions implemented.

Warehousing and order fulfillment: Forecast accuracy
Problem statement: Lawson was experiencing less than desirable forecast accuracy, inventory turns and order complete rates.
Action plan: Lawson implemented new, more sophisticated software that enabled specialization of roles at a higher level than previously existed. The combination of better software and higher-caliber, more focused resources resulted in better inputs, which led to improved forecast accuracy.
LSS results: Process changes and a new forecasting system helped the team achieve a roughly 20% improvement in forecast accuracy, significantly reduce back orders and positively affect complete order fill rates.

Put away at the customer

Problem statement: Orders were shipping in cartons that weren't full resulting in several forms of waste, including additional "void fill" material to fill up each carton, additional cartons and a higher freight cost resulting from additional packaging. Customers were frustrated because more boxes showed up than needed.

Action plan: The team analyzed root causes and found several gaps, such as errors in the item measurements, glitches in the cartonization software and poor-fitting boxes. Lawson cube-scanned all 55,000 items in inventory, fixed the software and adjusted the sizes of boxes used. It also put processes in place to ensure boxes were always shipped with the labels "up" and packing slips were always at the top of the box.

LSS results: The team was able to improve carton utilization by nearly 30%.

Where are they now? Six years later

Today, CI team members are viewed as coaches—not process owners. They provide training, guidance and accountability reporting including control charts. The culture of the organization is one of ownership and empowerment—a team that approaches challenges from a cross-functional perspective to identify enduring solutions.

With six years of experience under Lawson's belt, there are multiple lessons learned. They are listed below.

1. *Project selection is both an art and a science. It is striking the balance between learning and doing. Twenty percent of a person's time will be spent learning/training. It's an easier 20% if you get the project management right. Cross-functional teams are key—don't run projects in silos.*

2. *How you train is as important as what you train:*

3. *Lawson applied adult learning theories, including limiting lectures to no more than 60 minutes at a time.*

4. *On-going, visible support from the CEO and a mixture of "carrot and stick" incentives.*

5. *Trust the process—don't jump to solutions; otherwise the root cause will be missed.*

6. *Don't substitute process improvement for process design.*

7. *Have the team report out as the work is happening to executives, in town halls or other venues; don't wait for the big reveal. Steady, demonstrable progress is key to keeping the changes top of mind.*

8. *The goal is to improve; not to fix.*

9. *The focus should be on the process, not the people. Deming taught that many performance issues or defects are due to the process, not the individuals. When employees hear that and experience it in how Lawson runs the business, it helps remove fear of bringing problems forward.*

10. *An occasional look back at where you started can be helpful and reassuring: When you see what was once aspirational is now part of the fabric of the organization, it can be highly motivating.*

Case study: Coca-Cola
Thriving in a VUCA world

Perhaps you've never heard the term VUCA: It is an acronym for volatility, uncertainty, confusion and ambiguity. Like SNAFU and Known Knowns, it's a military term. This one was coined at the U.S. Army War College in the late 1990s, but it gained real traction following the 9/11 terrorist attacks to explain the rapidly changing and increasingly turbulent environment that is the "new normal." It is arguably an even more appropriate description of the landscape supply chain managers confront every day, making implementation of LSS, zero-based budgeting or any other major initiative even more challenging. This complexity further elevates the importance of OCM as the foundation for building your desired future state.

At the Coca-Cola company, change in the form of new supply chain processes, supply chain redesigns and the adoption of new technologies is a constant. Within the supply chain, the organization launches hundreds of new projects in any given year—new products and new categories that require new levels of speed to market; that is the key challenge. They are all launched in an environment characterized by business volatility, confusion and ambiguity about what the customer really wants and demands, requiring planning for an uncertain and rapidly changing future.

Yet, no great company can rest on its past performance. Dean Myers, Coca-Colas' recently retired vice president of Global Supply Chain, has developed a few keys that ultimately separate the victors from the victims of a VUCA world. He and his team used these principles almost every day and, "when we did, under any circumstance, under pressure and the presence of emotion, the principles helped us be better, faster and thrive in the VUCA world," Myers says.

If you want to go fast, check your alignment

The increasing pace of business often drives leaders to want to move as quickly as possible—a natural reaction in a volatile world—but herein lies the paradox of effective change management, according to Myers: To go fast, you need to start slow, with the proper alignment of all stakeholders.

To Myers, supply chain alignment means all parties agree on priorities, roles and responsibilities. To illustrate, let's use the example of selecting a new vendor for a raw material. Multiple functions, regions and business units may be affected by the change. There must be a common understanding and agreement regarding who will make the ultimate decision and how it will be implemented. In the absence of clear decision rights, second-guessing starts right away and the various stakeholders move to assert their will, resulting in potentially disastrous consequences.

Too often teams initiate work with great intentions but without clarity of intended results, budgets, decision rights, timeline or measurement processes. This never leads to a successful project.

Closely related to alignment are two other "As:" action and adjust. "Looking back at many supply chain and commercialization projects, there were both great successes and big failures," says Myers. "Here is a key learning: The source for success and the source of failure is the same thing: alignment." He adds that the deepness of the alignment at the early stages of any given project makes all the difference. Weak alignment, or no alignment, always leads to poor results.

What gets in the way of strong alignment? In Myers' experience, we too often avoid the tough alignment conversations so that we can go fast. "That never works, and misalignment creates slow work and rework," he says. "Action before alignment never creates the results you want. Improve your appreciation for strong alignment before action and you will greatly increase your power to manage through change and volatility."

At the end of the day, Myers adds, alignment is going to happen. Whether it happens at the start of an initiative, or at the end via re-work, is up to you. "Remember that misalignment destroys trust, and without trust, you can't go fast," he notes.

Even when you do the hard work of alignment, in a VUCA world, it is an iterative process. Whenever there is a change in team members, their roles or stakeholders, it's time to check alignment and adjust to ensure that everyone is on board. Even if all the players stay in place, frequent checks—and potential adjustments—are needed to prevent working on the wrong things because the environment changed. Remember the sequence as show in Figure 1.

FIGURE 1
Alignment sequence

Source: Authors

Making the invisible visible

Underlying Myers' strategy to dealing with VUCA is something he refers to as "making the invisible visible." This principle is key to developing the necessary alignment discussed above and can be thought of as a "search for common ground."

To illustrate the concept, think about a meeting with team members before an upcoming initiative. As they sit down at the conference table, everyone in the room has a personal agenda that can be boiled down to three things: 1) what they want; 2) what they don't want; and 3) some special interest or consideration they seek. Likely, those agendas are invisible, but ultimately, they're going to color the discussion and possibly drive the direction of the project. Myers notes that "it would be a lot easier if everyone came into the room wearing a white t-shirt with their three concerns printed on the front, but that's not going to happen."

The value we create as leaders is discerning those three things and making them visible for the stakeholders. Myers notes: "Your job and only job in virtually every meeting or interaction is to unearth, uncover and make that which is invisible…visible. Without that, you are just having a meeting and too often talking right by each other."

Zero-based mindset (ZBx)

Zero-based principles have been embraced by some of the world's best-known firms, including consumer goods company Mondelez and technology company Hewlett Packard Enterprise. What began decades ago as a technique that sets budgets to zero each year to cut unnecessary costs has evolved into an invaluable leadership tool that aligns the strategic priorities of the entire organization. With a more holistic zero-based mindset, or ZBx, leaders challenge their employees to change their old ways of thinking and consider the optimal resource allocation for the business to drive growth. The adoption of ZBx is on the rise: Before 2011, only 2% of the companies Accenture Strategy surveyed had initiated zero-based programs, and since 2013, adoption has exponentially grown by 57% every year.

ZBx emphasizes visibility and transparency and allows people to act like owners in both spend and reinvestment decisions. The result is a cross-organizational and holistic view of resources from the front office to the supply chain and everywhere in between. Realizing the full potential of ZBx requires much more than just changing the budget process—it must be a true culture transformation centered on unleashing growth. According to Vikrant Viniak, a managing director with Accenture Strategy, "Adopting a zero-based mindset requires developing a culture where people are engaged and motivated to make the right decisions and treat the company's money as if it was their own. With that owner mentality, employees gain empowerment and an understanding of how the savings they create are channeled back into the organization. It requires continuous training and discipline to get everyone in the right mindset and think like one team working toward the same goals—growth and competitive agility."

When executed properly, ZBx not only provides forensic visibility into an organization's spending patterns, but it also drives ownership and accountability across the organization. Utilizing an accountability matrix, ZBx employs a dual ownership approach—every expense is managed by both a budget owner and a cost category owner. This creates a healthy tension that reduces complexity, clarifies responsibility and helps enable a sustainable corporate lifestyle. It also encourages knowledge sharing and diversified thinking, as various skill sets are brought to bear to develop best in-class profitability practices.

Nick Richardson, sourcing director at HPE, has spent most of his career driving cost optimization programs. He says that "running zero-based programs requires employee empowerment through giving them the tools and dashboards that can help them drive better results. The tools demand continuous training and discipline." These tools have increasingly become more digital and incorporate artificial intelligence to support fact finding. Employing applications that can be added to a company's general ledger system to rapidly analyze transactions have led to discoveries within the first two weeks of a zero-based program. Creating automated dashboards help with ongoing ZBx journey management and companies can see how the initiatives affect business operations.

Nick Richardson further adds: "The teams that thrive in this environment are the ones that embrace change quickly and are willing to accept that the only constant is change. What worked yesterday may not work tomorrow, so preparedness for change is important."

High-profile struggles to generate growth at companies that have used zero-based principles have cast somewhat of a shadow—albeit an unfair one—on the practice. Companies must think beyond traditional zero-based budgeting tactics to a holistic, durable zero-based mindset that drives growth, innovation and competitive advantage.

Why is this so hard? It may be that you are more concerned with your needs than learning about the other person's needs. Remember the old saying" "People need to know how much you care before they care how much you know?" It applies here as well. In Myers' experience, "even if you don't like what you uncover, you must go there. Remember, being interested in the other person's positions does not require you give up what you want." The search for common ground will inevitably help "make the invisible, visible." While taking the time to understand and address multiple points of view may seem like common sense, the reality is that it is not common practice.

Communication, communication, communication

In each of the examples above, success or failure hinged on the organizational (or team) culture. In real estate, the three keys are "location, location and location." In establishing, maintaining or changing culture, the keys are "communication, communication and communication."

First, let's talk about the "what:" While there may be valid reasons for keeping some details confidential, the sooner you can share information the better. Transparency and candor will pay big dividends in the form of trust—the critical currency for team performance.

Further, communication must be a two-way street: It's critical that associates feel free to ask questions and raise concerns. A culture where bad news is either punished or ignored is detrimental to implementing change successfully.

Finally, communicate early and often—and through as many channels as possible. Too often, we underestimate the magnitude of communication necessary in change efforts. The reality is that communication needs increase exponentially with the size of the initiative, requiring world-class stamina, persistence and ingenuity to do it correctly.

The natural tendency is to assume that "by now everyone knows what we are doing" when in fact, they don't know, or they do know but don't know why or they just don't agree with it. If your initiative spans multiple geographies, the odds of this increase further. That has

> **Lawson Products and Coca-Cola have been successful because they did the hard work of OCM: They got everyone on board, they did the training, they thought through and planned for the implications and they communicated—early and often.**

certainly been the experience at Lawson Products and the Coca-Cola Company.

At the same time, both these organizations have found multiple channels to get the message across and then reinforced it with staff/shift meetings, town halls, intranet postings, mailings to associate's homes and social media. For example, at Lawson Products distribution facility, they use a "visual management" approach with white boards on the floor that are updated regularly—either real time or batched—to keep associates apprised of the results and share solutions to common challenges faced. There should also be multiple ways for associates to provide feedback and ask questions and raise concerns. Err on the side of over-communicating, then follow-up to check alignment.

Training: Arm your team with the skills for success

Even a team that is truly aligned won't make progress if it doesn't have the appropriate training for the task at hand. Lawson Products skillfully navigated this in the way projects were structured and sequenced to enable learning while doing. Depending on the scope of a pending change, a skills assessment exercise may be warranted to identify and address gaps. The recognition and willingness to invest in training sends a strong message to associates that the company cares—a message that will build trust.

While the effort required in successful organizational change management may be daunting, the payoff is worth it. Consider the alternative—attempting to implement change without the appropriate OCM can have far-reaching negative impacts on cost, service and reputation in addition to undermining any future initiatives.

Lawson Products and Coca-Cola have been successful because they did the hard work of OCM: They got everyone on board, they did the training, they thought through and planned for the implications and they communicated—early and often. Truly open communication creates trust and respect and is the hallmark of winning cultures. Anything is possible for people and teams who feel trusted and respected. ∞

Procurement improvement begins with process

To be successful, organizations need to tailor collaboration methods to organizational culture and needs.

By Marisa Brown, senior principal research lead, APQC

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Two winds of change have combined to create a perfect storm around the procurement function. From one direction blows the force of innovative technologies—such as blockchain, robotic process automation and machine learning—that have the potential to unleash procurement from tedious tasks and allow professionals to focus on more strategic, value-added work. At the same time, procurement is buffeted by the headwinds of market disruption: tariffs, cyber attacks and a tight labor market. All of this means that procurement's days in the back office are long over.

Procurement can and must act as a strategic business partner by driving process improvements, cost savings and customer satisfaction. At APQC, we find that procurement professionals understand this new reality, but are often unsure how to begin updating and streamlining their function. In years past, cost savings was the primary (and often, exclusive) measure of procurement performance. But as many professionals have learned the hard way, over-focusing on cost often creates problems downwind.

The key to unlocking more strategic procurement is end-to-end process improvement. Before you can productively measure and benchmark metrics such as cost savings, you must first assess and define processes. Establishing and enforcing consistent processes allows procurement to align with strategy, avoid redundancies and waste, increase internal customer satisfaction and drive innovation and cost savings that benefit the entire organization.

Assess and define processes with a standard framework

A standard process framework is a must-have for effective process improvement, measurement and benchmarking. A process framework is a means of grouping processes, activities and tasks into appropriately related categories. This classification structure allows the organization to define how processes relate to each other. Frameworks provide visibility into how work gets done, pinpoint and prioritize improvement opportunities and establish a common language across groups and geographies. Moreover, frameworks are essential to make an objective, apples-to-apples comparison of your processes and outcomes to those of your peers.

Multiple process frameworks are available, each with different focus areas and user bases. For example, the Supply Chain Operations Reference (SCOR) model, overseen by the Association for Supply Chain Management, is an established framework with a deep focus on the supply chain. APQC's Process Classification Framework® (PCF) organizes operating and management processes into enterprise-level categories, process groups, processes, activities and tasks. In the PCF, the procurement process group 4.2 "Procure materials and services" contains the following core processes:

4.2.1 Provide sourcing governance and perform category management

4.2.2 Develop sourcing and category management strategies

4.2.3 Select suppliers and develop/ maintain contracts

4.2.4 Order materials and services

4.2.5 Manage suppliers

The framework that will work best for your organization hinges upon several factors, including the scope of adoption (i.e., how many areas of the business will be affected), the scope of your process improvement goals and your organizational structure. A suitable framework typically incorporates some degree of specificity (either by industry or function), methods for traceability and definitions or key performance indicators (KPIs) for processes and activities.

Once you have chosen a framework, establish assessment criteria to determine which process elements require modification to meet business needs. APQC recommends handling modifications with a gentle touch. Too many adaptations and customizations will severely limit the organization's ability to use the framework for benchmarking. Best practice organizations adopt frameworks as completely as possible before they adapt them.

Pick measures that matter

In a field driven by precision and efficiency, procurement professionals need to pinpoint the right measures to track their performance and identify fruitful opportunities for improvement. Organizations such as APQC, ACSM and the Institute for Supply Management (ISM) have identified key performance indicators (KPIs) for procurement processes. Still, organizations must determine which KPIs are most critical for their business. The best way to do this is to look for measures that reflect strategic alignment, enduring relevancy and behavioral change.

Strategic alignment refers to the link between the measure and organizational objectives. Leading organizations use value stream analysis to align measures with strategic objectives. They enlist senior management or a centralized process improvement team to analyze the value stream and link measures to organizational goals.

Enduring relevancy means that the measure can be tracked at regular intervals and over time. Procurement professionals must periodically review measures to determine whether they need to be altered or replaced to accommodate changes in the business (e.g., new technology, corporate restructuring). They should also consider whether the overall measurement approach is working efficiently and provides value.

The measurement approach should also factor in ways to track behavioral change. Implementing a process framework and pursuing process improvement requires employees to change their behavior.

One aspect of managing this change is to use communication and engagement tactics to help employees understand the "why" and "how" behind process improvement. But it's equally important to use macro measures to assess the change effort and pinpoint the root causes of noncompliance issues. Leading organizations aim to establish a performance culture through their engagement and measurement approaches. They incorporate desired behaviors into employee evaluations and rewards, which helps entwine individual performance with organizational performance.

Ultimately, procurement professionals should measure and monitor a balanced set of KPIs, including outcome/impact measures, across a range of core categories. For example, APQC recommends the following KPIs for the most common measurement categories.

Cost effectiveness
• Total cost to perform the entire procurement process group, as well as each process:
   - Provide sourcing governance and perform category management
   - Develop sourcing and category management strategies
   - Select suppliers and develop/maintain contracts
   - Order materials and services
   - Manage suppliers

Cycle time
• Average supplier lead time on purchased materials
• Cash-to-cash cycle time in days
• Cycle time in hours to place a purchase order

Process efficiency
• Number of FTEs for the entire process group and each process
• Percentage of purchase orders approved electronically

Staff productivity
• Number of purchase orders and purchase order line items processed per procurement process group FTE
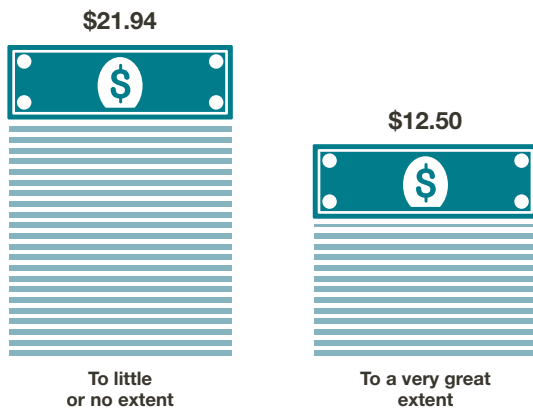
Case in point: Use of an approved vendor list

Optimized, defined and consistent procurement processes generate measurable benefits. Consider, for example, the use of an approved vendor list. An approved vendor list contains all suppliers that will be accepted to do business with the organization. Procurement or sourcing and

engineering personnel develop the list with key criteria including technology, functional fit of the product, financial stability and past performance of the supplier. To ensure consistent process execution, noncompliance with the vendor list should have documented and enforced consequences.

Impact of documented consequences for non-compliance on total cost to perform the process "select suppliers and develop/maintain contracts"

(per $1,000 purchases)

$21.94

$12.50

To little
or no extent

To a very great
extent

Source: APQC's Open Standards Benchmarking data in Procurement

Impact of documented consequences on total cost to perform the process "manage suppliers"

(per $1,000 purchases)

$27.46

$22.95

To little
or no extent

To a very great
extent

Source: APQC's Open Standards Benchmarking data in Procurement

APQC finds that only 39% of organizations with $500 million or more in revenue have extensively documented consequences for applying non-compliant sourcing processes. And only 37% *enforce* the consequences to a very great extent. But organizations that ensure all employees follow the correct process realize bottom-line benefits. Organizations that have documented consequences for non-compliant sourcing processes spend less to select suppliers and develop contracts as well as to manage suppliers. Figure 1 and Figure 2 show the impact of documented consequences for non-compliance on these two core procurement processes in organizations with revenue of $500 million or more.

Organizations that have documented consequences to a very great extent spend 43% less to select suppliers, and 16% less to manage them, compared to those that have little or no documented consequences.

The takeaway

Process thinking promotes standardization and efficiency in all areas of the business, and this is especially true of procurement. Organizations that have documented procurement processes (and consequences for noncompliance) have lower costs and are more efficient.

As you move forward in your procurement process improvement journey, ensure that you communicate metrics in ways that leadership and line employees alike can understand. The impact of even the most powerful metrics can wane if decision makers are forced to navigate cluttered dashboards to find the information they need. Keep it simple: Typically, ten measures or fewer are sufficient for a single dashboard. Also, be sure to provide context with your measures. Show how performance has evolved over time and consider external factors that may affect your data. This helps stakeholders set realistic expectations and helps them feel empowered to take correction action when issues arise. ⬲

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.

Building and sustaining university supply chain management programs

S everal years ago at the Academic Reception at the annual Council of Supply Chain Management Professionals meeting I was talking with several of my peers from other institutions. We calculated that collectively the four of us had been in this field for about 160 years. One of my colleagues looked around the crowded room and said it was great to be a part of this burgeoning field, to which I observed that the field had taken one hell of a long time to burgeon. When I first entered the field it was called "transportation and physical distribution management." It evolved into "transportation and logistics," then "logistics" and now "supply chain management."

Robert C. Lieb, Ph.D., is a professor of supply chain management in the D'Amore-McKim School of Business, Northeastern University, and is a frequent contributor to *Supply Chain Management Review*. He can be reached at r.lieb@ northeastern.edu.

During the past decade the number of university level supply chain management programs has expanded tremendously in recognition of the greater visibility of our discipline, its growing importance in global commerce and the robust market for students with a concentration in the field. That has brought some degree of euphoria with it, and as I reflect upon those developments it concerns me that the next generation of professors who will lead this field in the coming years doesn't necessarily understand what it took to get the larger programs to this point.

There was a lot of blood, sweat and tears involved; the progress was very slow, and often very political. In many cases alliances with faculty members in other disciplines were required to support those development efforts because making room in curricula for supply chain management courses/concentrations often involved giving less emphasis to more traditional areas of business. That in turn often involved explaining to our academic colleagues, in very basic terms, what our field was and why it was important. It also entailed designing courses and programs from scratch, bargaining for meager university resources, selling the programs to students, administrators and employers and building a faculty base.

That being said, I would like to make several suggestions to those who will be managing/ expanding university SCM programs in the future. The suggestions are based on concerns that I have about the current status and future prospects of university supply chain management programs.

First, there is a continuous need to remind our faculty colleagues and administrators of the value of our programs. Their support will always be necessary. Make sure that upper level university administrators are aware of the achievements of the program, your graduates and individual faculty members. The more that they are aware of those things the more likely it is that they will support those programs over time.

Second, recognize the precarious position of our supply chain management programs. A change in a university president, provost or dean can jeopardize programs that have existed for decades. At the same time, whenever there is a major curriculum review, our programs are in play. If something comes in, something goes out and traditional business areas like finance, accounting and marketing tend to have much more of a buffer around them than we do in such reviews. Be prepared to defend your programs, not only amongst yourselves in the hallways, but also in open forums. That may be uncomfortable, but it will be necessary.

Third, develop linkages with your colleagues in other functional areas of your universities, not only within business schools, but also with your colleagues in other disciplines such as economics and engineering. Universities are often much better at talking interdisciplinary education/research than they are at delivering it. Forge these relationships not only in terms of their basic value, but also in terms of their potential support for your programs over time.

Fourth, stop fighting with each other. At a number of schools, there have been long-standing conflicts between operations research and supply chain management faculty groups. The conflict often revolves around the age-old rigor versus relevance debate. Wake up. It's not necessary to choose one path versus the other. There are major contributions to be made by each group, but it's also important to understand that we have to do more than do research for each other.

Early in my career, my research primarily focused on transportation policy formulation, and I used to give my economist friends grief about only writing for each other. At a time when their research could have played a very significant role in promoting deregulation they were often hard-pressed to explain its relevance to the public policy makers who would ultimately decide if those changes would be made or not. I increasingly find myself being concerned about the same thing in our discipline.

That kind of infighting within our discipline can be deadly for programs. When our colleagues in other business disciplines see that, it's not hard for them to conclude that if we can't support each other within our group, why should they, in other disciplines, support our programs in tough times?

If you want to grow supply chain management programs, attract outside support and develop executive education opportunities, you need to translate your research into terms that those outside the academic world can understand. Failure to do so will dramatically limit the future growth of our field.

Fifth, anticipate future internal challenges to your programs. I can assure you that they will come. We have done a reasonable job teaching risk assessment and business continuity planning in the field of SCM. Apply the same basic principles to your programs. Don't be surprised by the challenges that most certainly will emerge in the future.

Sixth, continue to innovate. Our field is very dynamic and academic programs will need to continuously to reflect that reality.

All that said: Good luck—I wish you the best in expanding and sustaining your supply chain management programs. ◯◯◯

NEXT✕GEN
Supply Chain Conference

NEXTGEN SUPPLY CHAIN
Awards

For our inaugural event, *Supply Chain Management Review*, Peerless Media and IDC recognized five companies leading the way in the adoption of new technologies.

BY GARY FORGER, SPECIAL PROJECT EDITOR

We've all heard the buzzwords: Robotics, artificial intelligence, predictive and prescriptive analytics, blockchain and digital transformation. In fact, every day, we read about a new technology that is going to revolutionize the way business gets done and supply chains get managed.

Based on the press accounts, it's easy to think that every competitor in a given industry is already putting NextGen technologies to work while your organization is running in last place. But the truth is, most organizations are still in the investigation, and maybe pilot stage; few have actually deployed those technologies and fewer still have done so at scale.

But, a handful of innovators are putting tomorrow's supply chain technologies to work today. And it is these foresighted few that *Supply Chain Management Review*, Peerless Media and IDC honored with our first annual NextGen Supply

Chain Awards, recognizing the achievements of early adopters and industry leaders. The award winners were announced in Chicago at the NextGen Supply Chain Conference in April.

Read on to see what our award winners are doing. And, if you think your company is leading the way in the adoption of these technologies, we hope you'll enter a submission for next year's awards later this summer. You can learn more at nextgensupplychainconference.com.

Robotics: GEODIS

When 3PL GEODIS piloted mobile collaborative robots in its Indianapolis DC, it wanted to double the picking productivity of women's apparel by its workforce. And that's exactly what happened. But as Kevin Stock, senior vice president of engineering, explains, the benefits didn't stop

there. The initial 30-robot installation also included:

- working collaboratively with the existing workforce;
- simplifying the job, reducing travel distances, increasing job satisfaction, and
- reducing training times.

The overall success of the 90-day pilot was so impressive that GEODIS plans to roll out a total of 175 robots from Locus Robotics across four locations by mid-2019. Since the launch of the original pilot in October 2017, a total of ten million items have been picked.

Prior to the implementation, order pickers manually picked items to 50-pound pick carts that they pushed around a 139,000 square foot area of the 300,000 square foot facility. Radio frequency units directed their tasks—definitely an "old school" approach. However, innovation is a corporate objective at GEODIS and the concept of using collaborative robots fit that bill.

According to Stock, due diligence, partner selection and contracting began at ProMat in April 2017 and was completed by July. Prep work for the changeover began in August. "There was some minimal infrastructure needed in the DC to integrate an electric run for robot charging stations and some drops for robot induction areas," says Stock. "Otherwise the physical setup of our operation didn't change." The teams had to determine the format and number of plastic totes each robot would carry. IT work focused on integrating GEODIS's WMS with the robot management system and creating a digital warehouse map that the robots would follow.

Add in training time and change management sessions with the 60 team members who would be involved with the robots, and the prep work took roughly two months before the October 2017 go live with 30 robots. "We emphasized that the robots were not there to replace associates, but to improve their productivity," Stock recalls. That effort paid off and the associates have embraced working with robots.

Today, instead of pushing heavy carts through the picking area, robots come to the associates. Each associate wears a Bluetooth badge that communicates with the robot. A green light on the robot indicates it is waiting for an individual to perform a pick. A blue light comes on when the robot is moving to its next location. A pink light indicates it is stuck in a pick and requires attention. It's that simple.

If he had to do it again, Stock says he'd pick a time other than a month before peak to introduce a new technology. Nonetheless, GEODIS not only survived those challenges, it continues to expand its use of collaborative robots.

Artificial Intelligence: DHL

When it comes to NextGen technologies like artificial intelligence, DHL Supply Chain follows a simple rule: Improve operations by developing specialized tools that supplement people. "We're trying to develop new tools that allow people to make better decisions and improve accuracy," explains Justin Ha, director of solutions design at DHL Supply Chain, the company's contract logistics division. "At the same time, we're using AI to teach machines how to improve their efficiencies by eliminating touches and relieving people of tedious tasks."

DHL has already scored gains using AI in three key areas.

In one DHL operation, people used to evaluate incoming shipments to determine if extra handling is required. It was a high-speed manual process with on-the-fly decision making that was fraught with the potential for error. DHL now uses AI and computer vision to evaluate incoming shipments and determine proper handling for people on the line. Productivity has increased by as much as 14%. The accuracy of detecting critical pallet properties has also increased along with the speed of handling. Just as important, explains Ha, false positives have been drastically reduced. This allows DHL to process the inbound loads quicker in an environment under enormous time pressure, and have better traceability than the old method of capturing 2D and 3D images.

Artificial intelligence is also at work in a big-picture system called Resilience 360, a supply chain risk management platform. Risks can derive from a range of events, such as natural disasters to plant shutdowns. Machine learning identifies alternative solutions capable of keeping the supply chain up and running following a disruption. Ha says the alternative route finder usually takes less than eight seconds to develop post-incident alternative delivery routes.

In a third application, DHL Supply Chain uses smart piece-picking robots with put walls. In this application, a robotic arm, rather than an associate, picks items and places them in the selected cubbie. The robot utilizes machine

learning to better identify and grasp a wide variety of items, improving the robot's handling and grasp success rate over time.

There may even be opportunity for AI to improve warehouse management systems, says Ha. DHL has developed an internal eCommerce Business Intelligent Suite that uses analytical optimization tools to maximize the efficiency of various tasks in the operation and improve overall warehouse productivity as much as 15%. AI could make additional improvements by adding continuous learning and predictive analytics to the suite.

As to the future, Ha says there is room to do more: "As we become more digitized, we want to be in a position to introduce AI to more processes. Right now, we're in the early stages but we'll move rapidly down the road from here."

Analytics: Johnson Controls

Three years ago, the two most common complaints fielded by the Johnson Controls maintenance team were: "my work area is too cold (or warm)" and "our facilities guy says the chiller just doesn't look right, but he isn't sure what's wrong." Thanks to advanced analytics, that cycle has changed, explains Vineet Sinha, director of digital solutions business at Johnson Controls, a leading supplier of HVAC systems and building controls. "Our Cloud-based analytics platform now pinpoints what the real problem is rather than focusing on a chiller symptom that requires imprecise troubleshooting and often just as imprecise maintenance," Sinha says. "Furthermore, we have now connected all key systems in buildings including security, safety and external attributes."

Known as the Connected Equipment Program (CEP), the system uses data from onboard sensors, equipment specifications and past maintenance records to analyze performance and drive predictive diagnostics. Customers can access the Cloud-based platform any time of day from any location. It can even be accessed by smartphones using a 4G cellular network. Dashboards offer real-time data and analytics to monitor equipment, identify problems and perform specific, required maintenance procedures to fix them.

"The result is increased service responsiveness and reliability as well as reduced emergency outages and energy consumption," says Sinha. "Condition-based maintenance greatly simplifies the maintenance supply chain by right-sizing maintenance parts and optimizing inventory to actual conditions at a location."

Among the other benefits being realized by condition-based maintenance is a 65% reduction in the mean time to repair, a significant improvement given that the company manages 5,000 connected chillers in 37 countries. It is also contributing to revenue, with a service contract renewal rate of more than 90% for those companies on CEP. "That's the best metric of success we have," he says.

The original program is now undergoing next generation improvements with the help of artificial intelligence and machine learning that learns from past condition monitoring. The goal is high-precision predictions of machine performance and efficiency that pinpoint specific maintenance needs in real time. "We're enabling this through a proprietary Cloud platform called the Digital Vault. It is helping connect diverse building systems and creates insights for buildings and occupants," says Sinha.

Blockchain: IBM

There are plenty of ways for the electronic parts supply chain to be compromised. One is the loss of visibility as parts move through the supply chain. This could lead to the replacement of genuine parts with counterfeits. And then there is the problem of disputes during the Customs declaration process. None of these problems are easy to solve. But for IBM, blockchain is proving itself as a NextGen supply chain tool of the future to address these issues.

Today, IBM manages about 18,000 suppliers of parts to clients in more than 170 countries. "Our supply chain is vulnerable to disruptions that may have a significant impact on the execution and delivery of products and services," explains Tom Ward, AI project leader at IBM. "Having blockchain infused in our supply chains provides timely, secure and trusted information about parts and their movements," he adds.

Several attributes of blockchain make the technology attractive to IBM. To begin, all parties can access the blockchain ledger. However, each party sees only the parts of the ledger relevant to them. Transactions, which can't be altered after the fact, are updated in real time across the blockchain. And as Gergely Szlovak, cognitive advocacy lead explains, IBM's first three pilots proved blockchain works in the supply chain. Just as important, it resulted in measurable gains.

In the first pilot, IBM worked with hard drive supplier Seagate to guard against counterfeits. A total of 60,000 Seagate drives move through the IBM supply chain monthly. The pilot focused on just one part number that accounts for a significant number of drives. Initial savings to both companies is estimated at $2.2 million a year due to blockchain tracking. In addition, blockchain provides a significant mitigation of risk through improved tracking.

The second pilot focused on collecting real time visibility and other asset data about shipments and individual parts in the IBM supply chain. Disputes about parts in transit for IBM's $8 billion worth of systems annually are not uncommon. Blockchain improved parts traceability significantly.

The third pilot was intended to improve and expedite Customs clearance. Hard benefits included savings to suppliers of $600 per transaction and an additional $1,000 to IBM, resulting in a 40% cost avoidance just in clearing customs. Meanwhile, use of blockchain increased risk avoidance by 70%.

"There are still plenty of questions about how blockchain works in much of the supply chain, says Ignacio Escobedo, supply chain consultant, "but the pilots show that it is clearly a reality and not simply a fad."

Adds Ward: "With blockchain, you know you can trust the data. And the transparency of transactions for asset management is huge. None of that is possible with any other technology in the supply chain today. We've just started to scratch the surface with blockchain."

Digital transformation: Cisco

Most people think of Cisco as a world-class high-tech company. But four years ago, the company wondered why it couldn't also be a world-class logistics company. As Cisco's senior director of global logistics, Jack Allen was tapped to lead the project dubbed Logistics 3.0. "From the beginning, our objective was to enhance the customer experience, not make money on the logistics of moving parts around for our suppliers and customers," Allen explains.

Not that the whole idea didn't give him pause. "A digital transformation of logistics is not just a major undertaking. It fundamentally changes how everything works," Allen says. "And we were taking on every aspect of the movement of goods between facilities throughout the entire Cisco supply chain. There was more than one night when I wondered if we could pull this off."

Despite those misgivings, Allen and a team of up to 40 volunteers—no one was assigned to the project—did pull it off. Operational improvements include better visibility across the supply chain, as well as lower costs and greater efficiencies. Since the start of the Digital Transformation initiative, end-customer logistics volume at Cisco has grown more than 39%, with more than 1,500 customers and partners worldwide now leveraging the capabilities developed in the Logistics 3.0 program. They can access—at any time—the status of their order, including expected delivery time. Furthermore, Cisco acts as a one-stop logistics supplier for everything from freight insurance to consolidated delivery.

In addition to delivering an Amazon-like customer experience to industrial customers, new found supply chain efficiencies, savings and additional revenue are delivering benefits to Cisco's bottom line. Better yet, says Allen, those benefits recur year after year.

In retrospect, the program was hardly a slam-dunk. First, top management had to buy into the concept, according to Darren Mallard, senior manager of marketing strategy, who joined the project part way through. "Management did its due diligence and set benchmarks that had to be met along the way. And we exceeded their expectations," he says

As a result of the program, Cisco now has supply chain innovation centers in Houston, Texas and Istanbul, Turkey, where they test and implement new digital technologies that will drive continued improvements. Today, there is even an internal talent development angle to Logistics 3.0. Cisco takes on interns and Co-Op students from various universities, works with them over a three-year cycle and rotates them through third-party vendors in their supply chain. Globally, 293 students have participated in the program, with additional students joining each quarter/semester. And, 92 of them have gone on to become full-time Cisco employees. "It's really exciting to see the dreams of a corporation and of people turned into reality," says Allen. "I would do this all over again if asked. It's one of the most rewarding things I've ever done." ∞

SUPPLY CHAIN EXECUTIVE EDUCATION

What's the right combination?

As supply chain executive education continues to evolve, the options available to companies are expanding and becoming more personalized than ever.

BY BRIDGET McCREA, CONTRIBUTING EDITOR

E xecutive education has never been a one-size-fits-all resource, but with the advent of online learning, the proliferation of certification options and other new delivery methods, it has become even more personalized and targeted. This makes sense in a world where everyone from the kindergartener to the high schooler to the grad school student is learning via more differentiated, tailored means.

In supply chain, executive education is typically served up in the traditional classroom setting, online or via a hybrid approach that blends the two. The end game is usually an advanced degree, certification or completion of non-degree courses, depending on the individual's or team's needs. Along with open enrollment courses, institutions and organizations also develop customized education that's designed with specific companies in mind.

Evolving approaches

Meant to appeal to a wide range of professionals who are at different stages in their careers, supply chain executive education is both wide and varied. In some cases, executives benefit most from a hybrid or "blended" approach that incorporates two or more educational delivery options. A supply chain professional that attends a three-day intensive course on a college campus, for example, may also benefit from one or more certification courses. The same professional may want to take one or two online courses to get up to speed on specific topics (i.e., supply chain analytics or supply chain finance) at a later date.

"Every company approaches supply chain executive education differently, but there are definitely some models that repeat themselves time and time again," says Nora P. Neibergall, senior vice president at the Institute for Supply Management. For example, she says companies put their employees through certification programs to help those executives "level up" and get on common ground, stay engaged, and do something for themselves. "They also use executive education to get members of their teams up to the same baseline," says Neibergall, "and ensure that everyone has the same core knowledge and is speaking the same language."

What those companies should understand is that not every type of executive education is right for everyone, and that there are myriad options to choose from—not all of which will align well with the company's or the supply chain team's mission. This is an important consideration in an era where organizations want to see real results and payouts from their investments. "Because post-certification metrics are getting more and more important," states Neibergall, "every company has to develop a way to measure progress, but not all of them have figured out how to do that."

Finding the right mix

At the Center for Transportation and Logistics at the Massachusetts Institute of Technology, supply chain executive options include four-day to five-day open enrollment courses that cover a variety of different topics. Students come into the classroom for this learning, which today features more case studies, simulations and "action learning" than it did in the past (when it was largely lecture-based). It also offers a degreed program known as the MITx MicroMasters, and custom courses, the latter of which are online-based and take about 20 weeks to complete.

"We're tailoring the content to the company's learning objectives and what they want their employees to come away with in terms of gained knowledge," says Katie Date, manager, Corporate & SCALE Network Outreach. More recently, the institution began offering a series of courses in conjunction with a corporate partner that includes online education and live events (one-hour to two-hour online sessions where an MIT researcher leads a specific topic that correlates with the online content that was delivered over the prior three weeks to four weeks).

"The researcher presents a lecture, and then peppers in a discussion and/or different learning techniques that invite student participation," says Date. She says these custom options differ from the open-enrollment MicroMasters courses because they're personalized and can be offered to up to 100 students at a time (versus tens of thousands of MicroMasters' students). "We can create a course that is specifically tailored to the organization's learning objectives," she says, "and then monitor these students hyper-vigilantly to make sure that they're all understanding concepts before we move on to the next concept."

Content contextualization

Michigan State University has also been honing its executive education offerings, but in a different way. According to David Frayer, assistant dean for executive development programs, the institution is emphasizing individual learning pathways and content contextualization. Both cater to the individual executive, with the latter focusing on the importance of delivering supply chain management knowledge within a specific context.

"Companies are telling us that they want their employees to understand the best in supply chain, but that the knowledge needs to be set within the context of their businesses," says Frayer. In responding to that demand, MSU is creating programing that allows students to contextualize information in a way that makes the most sense to them.

"We're creating learning objects that can be delivered either online or face-to-face, and that factor in specific industries," Frayer explains. For example, a chief procurement officer (CPO) working within a specific business, business model and/or business strategy, needs to know how those elements translate into supply chain strategy. Or, the company that has global locations may need learning content that incorporates those international models into a single, unified learning experience for its executives.

Frayer admits that offering this level of content contextualization isn't easy, but says MSU is up to the task. "It's both a huge challenge and a huge opportunity, and it's where we're investing a lot of our time right now," he says. "We're moving very fast and hard on both the content contextualization and individualized learning pathways."

The full market basket

As companies gain a clearer picture of what they want from their executive education investments, and as providers find ways to meet and exceed those needs, the discipline as a whole will continue to evolve. At Penn State, for example, Steve Tracey, executive director for the Center for Supply Chain Research, says more companies are asking for virtual education—an option that works for some students, but isn't for everyone.

"There are a lot of success stories out there and the technology is getting better, but virtual learning isn't good for everything," says Tracey. "Just like in-person education is not a one-size-fits-all, online learning isn't either. The best approach is really a mix of the different delivery options."

It's also a mix of both credit and non-credit education, Tracey adds, in order to get both internal and external viewpoints on key topics, trends and challenges. "Particularly for large organizations," Tracey concludes, "you really need a combination of in-class education and virtual offerings to get the full market basket and the best solution for the organization."

Robots and gamification

Looking ahead, the academics and experts interviewed for this article expect supply chain education to align with what's going on in the supply chain itself, with automation, robotics and even gamification all playing more important roles in future executive education offerings.

The Association for Supply Management (ACSM), for example, regularly identifies trends that it expects to affect the profession. Then, it digs down into those trends to figure out what knowledge and skillsets supply chain professionals will need to be able to adapt to and embrace those changes.

Right now, Peter Bolstorff, executive vice president, corporate development, says ACSM is looking closely at how supply chain managers are using more bots to support their forecasting, pricing and replenishment planning activities. He sees this as a trend that will logically affect executive education in the near future. "The bots aren't replacing planners, but [they're] certainly repositioning what a planner does," he says.

"Likewise, you have robots entering the warehouse and manufacturing environments, where they are changing the nature of the work," Bolstorff continues, "so we're constantly trying to be on the leading edge of understanding how these shifts are applied to the profession, and how we can keep current with our body of knowledge."

Shay Scott, executive director of the University of Tennessee's Global Supply Chain Institute, concurs, and says that as technology continues to evolve, so too does the executive education that's associated with it. For instance, the program recently integrated gamification from a coursework standpoint with the goal of making the learning more "fun and more natural" for students. It's also using simulation exercises to bring the course content into real life, and leveraging synchronous technology (i.e., real-time communication between two people) for mediated exchanges in the context of executive education.

Inundated with information, supply chain executives need help making sense of it all; developing the frameworks and processes to manage it; and then applying their newfound knowledge in a way that provides value for their companies. Scott sees this is as further proof that the "sage on stage" instructional approach—where the dispenser of knowledge speaks from behind a lectern—no longer exists. That presents both opportunities and challenges for educational institutions like the University of Tennessee. "It's a fast-paced, changing world," says Scott, "and we're having a lot of fun in it." ∞

Supply chain management certifications offered by professional organizations and universities

There are more offerings than ever for supply chain professionals looking to improve their skills and further their careers.

BY MALINI NATARAJARATHINAM AND PRAHARSHA SUNKARA

Every company that delivers a product or service has a supply chain management department. With the increase in the complexity of supply chains, all companies are looking for people who can be good managers and lead the supply chain with minimal issues. Certifications in SCM can be a great boost for anyone who aspires to a career in this field. The aim of this article is to expand upon the available recognized SCM certifications in the United States and to aid budding supply chain executives in their efforts to keep abreast of this rapidly changing area.

Indeed, many professional institutions, universities, colleges and even companies are expanding their education programs, including certifications, in the area of supply chain management. The focus of these courses is not just on traditional supply chain disciplines, such as inventory management and the fundamentals of procurement, but also to address collaboration skills, strategic planning, work culture and information technology, to name a few.

Given the number of options, choosing a certification is highly dependent on the expectations of the individual, his or her experience and career expectations. For instance, for someone with a global perspective, the APICS certifications are recognized across the globe, while university-offered certifications are better recognized in the United States compared to other parts of the world.

In the following pages, we present details on the certifications offered by professional organizations such as APICS, CSCMP and ISM, along with certificate programs available at more than 40 universities and academic institutions. The aim is to provide a basic understanding of the type of certifications available as well as information the eligibility requirements, expectations and requirements for completion of the certificate program. Please keep in mind that information on certification programs is subject to change. We highly recommend that readers check the respective certification program Websites before making a final decision.

PROFESSIONAL ASSOCIATIONS
ASCM (Association for Supply Chain Management)

With over 45,000 members and more than 250 global partners, ASCM is the global leader in supply chain learning, transformation, innovation and leadership. The organization offers three certifications and one endorsement for individuals and one certification for corporate: APICS Certified in Production and Inventory Management (CPIM), APICS Certified Supply Chain Professional (CSCP), APICS Certified in Logistics, Transportation and Distribution, APICS Supply Chain Operations Reference Professional (SCOR-P) and the ASCM Enterprise Certification.

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APICS Certified in Production and Inventory Management (CPIM)

APICS CPIM is recognized worldwide as the standard of professional competence in production and inventory management. Candidates learn the basics of production and inventory management, such as the required terminologies, concepts, demand planning and management, procurement, scheduling, continuous improvement and related areas. CPIM is a recognized addition to the profile of anyone looking to advance a career in supply chain management; it is almost a necessity for individuals whose day-to-day activities involve working in production and inventory management, operations, supply chain management, procurement, purchasing and materials management departments.

Candidates must pass two exams within three years to earn the APICS CPIM certification

- CPIM Part 1
- Module 1 — Basics of Supply Chain Management
- CPIM Part 2
- Module 1 — Strategic Management of Resources
- Module 2 — Master Planning of Resources
- Module 3 — Detailed Scheduling and Planning
- Module 4 — Execution and Control of Operations

There are a number of resources available to help candidates study for the Part 1 and Part 2 exams. apics.org/cpim provides tips to aid exam preparation and to tackle the questions asked during the exam.

Candidates must pass two computer-based 150-question exams to become certified.

To maintain the APICS CPIM certification status, candidates must earn a total of 75 points every five years. Failure to maintain may lead to the suspension of CPIM credentials and also require a candidate to re-take all of the exams.

APICS Certified Supply Chain Professional (CSCP)

The APICS CSCP certification was launched in 2006. Since then, more than 25,000 professionals from nearly 100 countries have earned this designation.

APICS CSCP certification distinguishes a candidate as an industry expert in the field of supply chain management. It is one of the most widely recognized certification programs and is also the most sought-after designation by many employers. APICS CSCP exams are offered at locations around the world.

The program focuses on improving a professional's expertise in the field of global supply chain management in areas such as customer relations, information technology enablement, logistics and international trade.

To be eligible for the APICS CSCP, one must have:
- three years of business-related experience;
- bachelor's degree; and
- CPIM, CFPIM, CIRM, SCOR-P, C.P.M., CSM or CPSM designations.

The APICS CSCP exam consists of three modules, which must be mastered for certification.
- APICS Supply Chain Management Fundamentals
- Supply Chain Strategy, Design and Compliance
- Implementation and Operations

There are a number of resources available to help candidates study for these modules. apics.org/acsp provides tips to aid exam preparation and to tackle the questions asked during the exam.

To maintain the APICS CSCP certification status, candidates must earn a total of 75 points every five years. These points can be earned by continuing education, publications and service to the operations management profession. Failure to maintain may lead to the suspension of CPIM credentials and also require a candidate to re-take all of the exams.

APICS Certified in Logistics, Transportation, and Distribution (CLTD)

The APICS Certified in Logistics, Transportation and Distribution (CLTD) designation assesses individuals based on a comprehensive body of knowledge, best practices and standards. Earning the CLTD credential validates a professional's expertise in the logistics, transportation and distribution.

Launched in 2016, this program features a single computer-based exam developed around new courseware, self-study and instructor-led education opportunities.

The APICS CLTD program consists of eight modules critical to the logistics industry, including:

Peerless Media
Cares

SUPPORTING
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Peerless Media supports the mission of the Beauty Foundation which is to inspire courage, strength, and confidence to those affected by cancer. We believe in making a difference in the lives of those suffering from cancer. Our goal is to ease the overwhelming financial and emotional strains associated with cancer treatment. Join us on our mission to help families fight cancer… because life is beautiful.

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Peerless Media is a proud supporter of The Beauty Foundation for Cancer Care, a nationwide 501c3 organization that recognizes the beauty in families stricken by cancer as they come together to fight the disease.

- Logistics and Supply Chain Overview
- Capacity Planning and Demand Management
- Order Management
- Inventory and Warehouse Management
- Transportation
- Global Logistics Considerations
- Logistics Network Design
- Reverse Logistics and Sustainability

The APICS website (www.apics.org) provides many resources on the CLTD Learning System to help individuals prepare for the exam.

To apply for the APICS CLTD, submit an eligibility application two weeks prior to registration. The eligibility application must include:

- 3 years related business experience, or
- Bachelor's degree or the international equivalent, or
- CSCP, CPIM, CFPIM, CIRM, SCOR-P, CTL, C.P.M., CSM OR CPSM designations

In order to maintain the certification, designees must abide by the APICS Code of Ethics, which can be found on the APICS website (www.apics.org/cltd). Additionally, an individual must earn a total of 75 maintenance points and apply for maintenance every 5 years. These points can be earned by continuing education - presentations, publications, and educational development - service to the operations management profession, and/or professional membership. If the credentials are not maintained, the certificate will be suspended. Each additional year of suspension, up to 5 years, requires additional professional development point in order for the certification to be reinstated. After 5 years of suspended credentials, the candidate will be required to take the exam again.

APICS Supply Chain Operations Reference – Professional

APICS SCOR-P model helps supply chain professionals manage and measure the performance of a global supply chain using the SCOR model. Widely recognized, the SCOR-R endorsement enables professionals to increase the performance of their supply chains using the knowledge gained in SCOR model.

The APICS SCOR-P endorsement enables candidates to standardize performance metrics, create best practices that affect supply chain performance, and the management of critical supply chain resources. In order to be eligible for this certification, candidates must have five years of experience working in supply chain management. APICS conducts three days of training for the APICS SCOR-P exam. While attendance at the training sessions is not a pre-requisite to taking the exam, candidates are required to purchase the SCOR course in order to attend the exam.

After purchasing the SCOR course, the candidate will receive an e-mail with a Notice to Schedule (NTS) the exam date. This NTS is valid for six months

ASCM Enterprise Certification

The ASCM Enterprise Certification is the industry's first and only corporate supply chain designation that measures social responsibility, economic sustainability, and ecological stewardship. This program aims to empower organizations to reach goals, improve results, and be more competitive in today's global business world. This unique designation incorporates Supply Chain Operations Reference (SCOR) content and all certification bodies of knowledge.

Earning the Enterprise Certification can help your organization:

- Gain a competitive advantage through showcasing economic, ecological, and ethical supply chain practices
- Demonstrate transparency to prospective customers and consumers
- Ensure suppliers align with your organization's values
- Manage accountability to support your organization's ethical standards
- Embrace a culture of social responsibility
- Showcase your supply chain excellence

Evaluations of the ethical practices of an organization's supply chain include the review of the supply chain for: anti-corruption and anti-trust, codes of conduct, confidentiality of information, human rights and labor practices, intellectual property and patents, and responsible marketing and sales engagement.

Evaluations of the economic practices of an organization's supply chain include the review of the supply chain for: business integrity and company reputation, board and

corporate leadership, enterprise risk and crisis management, materiality index, responsible tax, supply chain strategy and differentiated operating models.

Evaluations of the ecological practices of an organization's supply chain include the review of the supply chain for: circular economy, climate strategy, energy, water and waste, material usage, and product life-cycle stewardship.

Additional information can be found on ascm.org/enterprise

CSCMP's SCPro Supply Chain Management Certification Program

The SCPro Supply Chain Management Certification is offered by the Council of Supply Chain Management Professionals (CSCMP).

SCPro certification is a three-level certification process that validates a professional's ability to assess business challenges and effectively implement improvements in the area of supply chain management.

Level One. Level one certification consists of eight modules and demonstrates a solid foundation of knowledge in all areas of supply chain management. In order to complete this level, candidates are required to have a bachelor's degree or four years of relevant work experience.

Level Two. Level two certification covers the analysis and application of supply chain challenges. In order to be eligible for level two, candidates must have a bachelor's degree and three years of work experience or, alternatively, seven years of work experience along with level one certification.

Level Three. Level three certification requires candidates to perform hands-on analysis within a working environment and to create a detailed project plan that generates results such as increase in ROI, cost reductions and improvements. In order to be eligible for level three, a candidate should have a bachelor's degree and five years of work experience or, alternatively, nine years of work experience along with level one and level two certifications.

Candidates with all three levels of certification can demonstrate to an employer that they are well versed with the most important concepts required to manage today's supply chains.

The Hackett Institute's Certified Enterprise Analytics Professionals

The Certified Enterprise Analytics Professional program, delivered via a dynamic e-learning platform, offers comprehensive training and development in the area of advanced analytics. The program is designed to build the analytics knowledge of business professionals at all levels and within multiple functional areas. Professionals will improve their mastery of the analytics techniques and tools necessary to effectively analyze, predict and influence business performance.

While this program is currently offered to organizations seeking to improve the skills of its teams, it will soon be available to individuals.

Information can be found on the Hackett Institute website www.thehackettgroup.com/certified-enterprise-analytics-professionals/.

ISM's Certified Professional in Supply Management (CPSM) Program

With nearly 45,000 members worldwide, the Institute for Supply Management is one of the largest global organizations focused on improving procurement and supply management. ISM has certified nearly 60,000 procurement professionals in more than 30 countries worldwide.

The Supply Management Program helps candidates become experts in critical areas of supply chain management such as sustainability, strategic sourcing and forecasting. The eligibility requirements for this exam are:

- three years of experience in supply chain management with a bachelor's degree or equivalent;
- five years of supply chain management experience without a bachelor's degree; and
- successfully pass three CPSM exams.
  In order to earn this certification, candidates must complete in order the following three exams.
- *Exam 1:* Foundation of Supply Management
- *Exam 2:* Effective Supply Management Performance
- *Exam 3:* Leadership in Supply Management
  Preparation resources for this certification

can be found on the ISM Website (instituteforsupplymanagement.org).

ISM's Certified Professional in Supplier Diversity (CPSD) Program

The Supplier Diversity Program (CPSD) is best for professionals who participate in the development of supplier diversity initiatives. The eligibility requirements for this exam are:

- pass the CPSD exam;
- Exam 1 for CPSD is waived if the candidate has CPSM certification;
- five years of experience in the area of supplier diversity or supply chain management;
- a bachelor's degree and three years of experience in the area of supplier diversity or supply chain management.

Preparation resources for this certification can be found on the ISM Website (instituteforsupplymanagement.org).

Next Level Purchasing Association
NLPA SPSM Certifications

The Next Level Purchasing Association (NLPA) currently offers three certification levels that are open to supply chain professionals who are members of the NLPA. A fourth level is expected to be available in 2017.

The SPSM program covers essential procurement skills and consists of six online purchasing courses and an exam that focuses on the most effective purchasing and supply management techniques, tactics, and strategies. Candidates have up to one year to complete the program, but it can be completed in less time.

Level 2, or the SPSM2 certification, is open to individuals who have earned the SPSM certification and covers global procurement management. The program consists of four online procurement courses and an exam.

Level 3, or the SPSM3 certification, is available to individuals who have earned the SPSM and SPSM2 certifications. The program is designed to help professionals master the skills to collaborate with other departments leading to even better results and a greater bottom-line impact. The program consists of four online procurement courses and an exam.

Level 4 will cover social responsibility and strategic supplier diversity practices.

Information is available on the NLPA website (www. nextlevelpurchasing.com).

Sourcing Industry Group (SIG University)
SIG University Certification

The SIG University certification is focused on implementing methodologies and best practices in the areas of strategic sourcing, outsourcing, governance, risk and compliance. A 12-week course is currently available for Certified Sourcing Professionals, with online courses being added for Certified Sourcing Executives and Certified Governance and Risk Professionals. The curriculum is offered to people at all levels in their sourcing careers who seek training opportunities. Each certification level consists of modules with interactive lessons and end-of-unit assessments. Each certification is valid for five years and was developed utilizing leading online best practices enhanced with relevant real-world experiences.

Information is available on the SIG University website (http://sig.org/sig-university).

CERTIFICATIONS OFFERED BY UNIVERSITIES

Apart from professional organizations, nearly 40 U.S. universities—and possibly more—have launched certification and degree programs in the field of supply chain management. The basic information on certifications is discussed below.

Air Force Institute of Technology
Graduate Certificate in Supply Chain Management

This certification provides candidates with a graduate level education in the fundamentals of supply chain management with special emphasis on Department of Defense and Air Force applications. In order to be eligible for this program, candidates should have a bachelor's degree or equivalent with an overall GPA of 3.0 or higher. The curriculum consists of five graduate level courses, a total of 17 credits along with a non-credit business math review course. Candidates take one course every quarter and courses are offered once every year. Courses are available via video teleconferencing, online or in the classroom.

American Public University
Graduate Certificate in Logistics Management

This graduate level certification provides the skills and knowledge required to excel in supply chain management and logistics. Eligible candidates are expected to have a bachelor's degree or equivalent. Candidates complete 18 credits hours, or six courses, to achieve this certification over a period of 12 months. While the program is taught in the classroom, an online version may be available on request.

Arizona State University
Supply Chain Management Certificate

The Supply Chain Management Certificate at Arizona State University provides in-depth knowledge of industry best practices and benchmarks. This certification is ideal for professionals who have at least two to three years of experience in supply chain management. It consists of two core courses and a choice of elective tracks. Candidates can customize their certificate with a specialization in operations management, supply management and logistics management. Courses do not count toward academic credit but do qualify for 4.5 continuing education units (CEU's). These can be applied towards CPCP certification, CPM re-certification and APP re-accreditation program. The course is delivered online and can be completed in less than six months.

California State University at Dominguez Hills
Online Certificate in Purchasing Education and Training

This certificate provides a broad level education on the principles of purchasing and procurement management. It is ideal for professionals who are currently working in the area of supply chain management and quality assurance, as well as those anticipating a career change. Courses are offered via online trimesters each year. Courses start in January, April and September. Each course is 13 weeks long. In order to obtain the certification, candidates must complete a total of five required courses with a GPA of 2.5 or better.

Online Certificate in Supply Chain Management

This certificate provides a broad level education on the principles of supply chain management. It is ideal for professionals who are currently working in the areas of production and inventory control, manufacturing, quality assurance, purchasing and procurement as well as those anticipating a career change. Courses are offered via online trimesters each year. Courses start in January, April and September. Each course is 13 weeks long. In order to obtain the certification, the candidate must complete a total of five required courses with a GPA of 2.5 or better.

California State University at Fullerton
Supply Chain Management Certificate

The Supply Chain Management Certificate gives candidates the opportunity to learn how to handle and manage various activities within the area of supply chain management. This certificate is ideal for professionals who have prior experience working in the field of supply chain management as well as those anticipating a career change. Candidates are required to complete a total of six courses in order to earn the certification. The certification can be completed within a period of one year; upon completion of the requirements, candidates are also awarded 12 Continuing Education Units (CEUs). The program is taught in the classroom, but an online version might be available on request.

California State University at Long Beach
Global Logistics Specialist Online Professional Designation Program

This certification provides candidates with an insider's view of transportation and supply chain management. Offered through the Center of International Trade and Transportation, it is the only program that offers the Global Logistics Specialist designation. This certificate is ideal for professionals who have prior experience working in the field of supply chain management as well as those anticipating a career change. Candidates are required to complete a total of five courses and an online capstone project within two years in order to earn the certification. All modules are available online and the designation can be completed within one year.

Columbus State Community College
Supply Chain Management Certificate

The Supply Chain Management Certificate provides candidates the opportunity to learn about the planning and management of integrated supply and demand management processes across companies, both domestic and international. Anyone who aspires to a career in supply chain management can pursue this certification. The program is completely online and requires candidates to complete 6 courses in one year.

DePaul University

Logistics and Supply Chain Management Certificate Program

The Logistics and Supply Chain Management Certification Program provides candidates with an overview of the critical aspects of supply chain management by not just taking the internal operations of a company into consideration, but by also including the supplier and end customer in the picture. This certificate is ideal for professionals who have prior experience working in the field of supply chain management or consulting and with experience with ERP systems. Completing the online 17-week course also prepares candidates for the APICS CSCP certification.

Georgia Institute of Technology

Distribution Operations Analysis and Design Certificate

This certification equips professionals in distribution operations with the necessary skills for facility operations and improvements. It is ideal for professionals who have prior experience in distribution operations. A classroom-based program, candidates are required to complete three core courses and one elective within a span of six years.

Health and Humanitarian Supply Chain Management Certificate

This certificate is designed for professionals in non-governmental organizations (NGOs), industry and government who take active participation in Health and Humanitarian activities. Courses are designed to provide the necessary skills to improve decision-making processes, response operations planning and system design. A classroom-based program, candidates are required to complete three core courses within a span of six years.

Lean Supply Chain Professional Certificate

The Lean Supply Chain Professional Certificate provides candidates with the skills in problem identification, root cause analysis and problem solving. Upon completion of the program, candidates will be equipped to develop, lead and implement lean principles within a supply chain. This certificate is ideal for professionals who have experience in supply chain management and are looking for opportunities to expand their knowledge. Courses are available in the classroom and online and require candidates to complete 3 core courses within a span of six years.

Strategic Sourcing and Supply Management Certificate

This certificate is designed to empower sourcing, planning and procurement professionals to lead their companies through the complexities, risks and rewards of a global sourcing environment. The program is classroom-based and requires candidates to complete three core courses within a span of six years.

Supply and Demand Planning Certificate

This certificate provides candidates with an understanding of the important techniques and components related to integrated supply chain planning. The certification is ideal for professionals who have prior experience in the area of supply chain management, ranging from engineers up to the chief financial officer. This is a classroom-based program that requires candidates to complete three core courses and one elective within a span of six years.

Supply Chain Management Certificate

The Supply Chain Management Certificate gives candidates a cross-domain understanding of how to handle and manage various activities within the area of supply chain management. The certificate is ideal for professionals who have prior experience working in the field of supply chain management as well as those anticipating a career change. It is classroom-based and requires candidates to complete two core courses and two electives within a span of six years.

Golden Gate University

Graduate certificate in Global Supply Chain Management

The Global Supply Chain Management certificate is ideal for anyone who possesses a bachelor's degree and is looking for opportunities in the area of supply chain management. Courses are offered in the classroom and online. To earn this certificate, candidates are required to complete two core operations management courses, two elective operations management courses and two other elective courses. The elective operations management courses allow candidates to tailor their certificate.

Lonestar College System
First Line Logistics Leader Certificate

The Logistics Leader Certificate prepares graduates for employment opportunities in the area of supply chain management, materials management, inventory management and distribution. The certificate is ideal for professionals who have prior experience working in the field of supply chain management as well as those anticipating a career change. Courses are classroom-based and candidates are required to complete five courses within a semester.

Loyola University Chicago
Supply Chain Fundamentals Certificate

The Supply Chain Fundamentals Certificate is a graduate-level, five-course certificate that delivers an essential foundation in supply chain management. It provides the skills central to effective end-to-end supply chain management, and indispensable insights for today's supply chain professionals. The certificate is designed for current supply chain professionals who need to enhance their knowledge base. It is also offers a specialization for students who are currently pursuing a graduate business degree, and a complement for MBA graduates who want to retool or enhance their resume.

Customized Educational Programs

Loyola's custom educational programs are designed for organizations, and not individuals. Though the Loyola Business Leadership Hub, the Executive and Professional Education Center team designs and delivers a training solution and professional development certificates with an organization's needs in mind. The training programs are fully customized to the audience in content, format and delivery, and focus on issues that concern a specific business. The portfolio of programs includes competitive supply chain strategy, risk management, leadership development, project management, change management, finance for the non-finance manager and online marketing for executives. Other programs can be developed.

Michigan State University
Master or Advanced Master Certificate in Supply Chain Management and Operations

Michigan State University offers 3-Course Master Certificates in Advanced Procurement Management, Global Supply Chain Management, Supply Chain Management and Logistics, Supply Chain Management and Operations, Supply Chain Management and Procurement and Integrated Supply Chain Management. The school also offers 5-Course Advanced Master Certificates in Supply Chain Management and Procurement and Integrated Supply Chain Management. Offered online, classes are available on the participant's schedule through an interactive and customizable learning experience. Upon completion, candidates will be able to identify key elements of manufacturing planning and control systems and develop leadership skills that will ensure continuous improvement. The certificate is ideal for professionals who have prior experience working in the field of supply chain management as well as those anticipating a career change.

MIT
Executive Certificate in Technology, Operations and Value Chain Management

This executive certificate provides an opportunity for non-technical executives and tech-savvy managers to learn how to model and solve problems faced by companies within the current rapidly evolving technologies and global networks. The program is ideal for professionals who currently hold a position of senior manager or higher within a company. Candidates are required to complete four courses. The courses are classroom based and are two to five days in duration.

MITx (MOOC)
MicroMasters® Program in Supply Chain Management

Gain expertise in the growing field of supply chain management through an innovative online program consisting of five courses and a final comprehensive exam. The MicroMasters Credential is an advanced,

professional, graduate-level foundation in all aspects of supply chain management. Learners who earn the Micro-Masters credential can then apply for an accelerated, on campus, master's degree program at MIT or other top universities. It represents the equivalent of 1 semester's worth of coursework at MIT and covers all aspects of supply chain analytics, design, technology, dynamics and end-to-end supply chain management. Access to the videos, problems and other materials is free and open to anyone while certification requires a nominal fee.

Northeastern University
Supply Chain Management Graduate Certificate

The Supply Chain Management Graduate certificate is for professionals who wish to advance their careers in supply chain management as well as those anticipating a career change. Candidates must complete three core courses and two elective courses while maintaining a 3.0 GPA in order to earn this certificate. The certification can be completed in two semesters.

Penn State University
Graduate Certificate in Supply Chain Management

The Graduate Certificate in Supply Chain Management provides candidates with the ability to develop supply chain solutions for their organizations while gaining an understanding of domestic and global supply chain networks. The certificate is designed for working logistics professionals; professionals with backgrounds in engineering, science and liberal arts are also accepted into the program. Courses are classroom-based and require candidates to complete four courses. The program can be completed in a span of two semesters.

Professional Certificates

In addition to the graduate certificate program, Penn State offers Professional Scholar and Executive Scholar certifications in seven areas: Strategy and Organizational Performance, Supply Chain Operations, Supply Chain Management, Supply Chain Leadership, Strategy and Organizational Performance–Emphasis in Supply Chain, Supply Chain Leadership–Emphasis in Organizational Performance, and a Custom Certificate. Participants choose from a curriculum of 16 short courses, offered twice year, with more courses in development. Professional Scholars earn any two professional certificates; Executive Scholars earn any three professional certificates.

Portland State University
Graduate Global Supply Chain Management Certificate

Portland State's online master-level certificate is designed for current MBA and Master of International Management students to expand upon their business knowledge; the certificate is also an excellent stand-alone credential for those currently working in supply chain. The university has partnered with the region's top employers, including Boeing and Nike, to develop an integrated supply chain program for today's global supply chain professionals. The program consists of three required core courses and one additional elective. All courses can be transferred into the master's degree program.

Certificate in Supply Chain Management

The SCM certificate program is a class-room based program designed to help supply chain professionals expand their knowledge base with relevant, practical curriculum that builds your skills in this dynamic field. All of our courses are taught by experienced SCM industry professionals. The program consists of four required core courses and two electives. The program can be completed in two terms. Courses can be taken individually or can be applied to a certificate within a three-year limit. Courses completed outside of the three-year limit will need to be retaken to qualify for certificate completion.

Rutgers State University
Supply Chain Management Certificate

The Supply Chain Management certificate program covers the major aspects of supply chain management such as sourcing, procurement, logistics and operations. Candidates learn how to execute a supply chain management

plan in today's competitive world. This certificate is ideal for higher-level managers and directors who have at least five years of managerial experience. A three-day program, participants are required to complete assigned readings and case studies by the end of the program.

Shippensburg University
Advanced Supply Chain and Logistics Certificate

The Advanced Supply Chain and Logistics Certificate is designed for working professionals who aim to gain an understanding in the area of supply chain management and logistics as well as those anticipating a career change. The program is also ideal for individuals who have prior experience in engineering, science and liberal arts. The candidate is required to complete six courses. Courses are classroom-based and can be completed within a period of one year.

Southern New Hampshire University
Operations and Supply Chain Management Graduate Certificate

This certificate is designed to introduce candidates to key supply chain concepts, strategies and processes, such as inventory control, warehouse management, transportation and procurement. This certification is ideal for professionals in the area of supply chain management and quality assurance, as well as those anticipating a career change. Courses are offered online and are available throughout the year. Candidate must complete four core courses and two electives.

Southern Polytechnic State University
Industrial Engineering Technology Department Certificate of Logistics

This certificate program provides training on current trends in supply chain management and improves the skills and knowledge of candidates. Applicants must have a high school degree or GED and have been out of high school for at least five years or have earned at least 30 credits from an accredited institution with a minimum 2.1 GPA. Candidates are required to complete seven courses. Courses are offered in the classroom and online and can be completed within a period of four to six semesters.

St. Louis University
Integrated Supply Chain Management Program

The Integrated Supply Chain Management Program offers comprehensive management development tools and techniques for supply chain management professionals. The certificate is ideal for professionals who have at least three years experience in the functional areas of supply chain management. Each of the required seminars are offered twice a year. Candidates must complete all the seminars within a period of 18 months.

Stevens Institute of Technology
Logistics and Supply Chain Analysis Graduate Certificate

The Logistics and Supply Chain Analysis Graduate Certificate focuses on the theory and practice of designing and analyzing supply chains. This certificate is ideal for working professionals looking for opportunities to expand their knowledge, especially in the areas of transportation and inventory control. Courses are offered in the classroom and online. Candidate are required to complete four courses.

Syracuse University
Executive Certificate in Supply Chain Management

The Executive Certificate in Supply Chain Management can be earned by completing any five of the following courses.

- Introduction to Supply Chain
- Six Sigma Black Belt
- Supply Chain Systems
- Project Management
- Fundamentals of Sourcing
- Lean Manufacturing and Lean Champion

Each course is roughly 10 weeks long. All programs have been designed for working professionals, from engineering up to the president of a company.

Towson University
Supply Chain Management Post Baccalaureate Certificate

The Supply Chain Management Certificate provides candidates with a competitive advantage in analyzing and controlling the activities and trends within a supply chain. The certificate is open to anyone who wishes to learn more about the field of supply chain management. Successful candidates can continue on to the Master's program. Candidates must complete 15 credits or five courses. Courses can be taken in the evenings and can be finished within a year.

University of California at Riverside
Professional Certificate in Purchasing, Logistics and Supply Chain Management

This certificate integrates the concepts of purchasing, logistics and supply chain management in one program. It is designed to help professionals develop their skills and capabilities in these areas and is offered in collaboration with the Institute of Supply Chain Management. The certificate is ideal for professionals who have prior experience working in the field of supply chain management as well as those anticipating a career change. In order to earn this certificate, candidates must complete three required courses and three elective courses. Classroom-based courses can typically be completed within a period of nine months to one year.

University of California at Los Angeles
Supply Chain Management certificate

The Supply Chain Management certificate offers training and tools to help manage the critical aspects of supply chain management, logistics, purchasing and inventory management. It is open to anyone who wishes to learn more about the field of supply chain management. Courses are offered online and candidates are required to complete six mandatory courses and two electives with a grade of "C" or better. Courses have to be completed within five years.

University of California at San Diego
Certificate in Purchasing and Supply Management

The certificate in Purchasing and Supply Chain Management provides the practical information and techniques needed to solve real supply chain issues. This certificate is ideal for professionals who have prior experience working in the field of supply chain management as well as those anticipating a career change. Courses are classroom-based and require candidates to complete three mandatory courses and six electives courses. Designed for working professionals, courses can typically be completed within a period of one year.

University of Michigan - Ann Arbor
Lean Supply Chain and Warehouse Management Certificate

This certification program provides a comprehensive approach to developing lean supply chain and logistics systems that help tackle strategic and tactical challenges. It is ideal for professionals who have prior experience working in the field of supply chain management as well as those anticipating a career change. A two-week-long classroom program, candidates are required to complete two online exams.

University of Missouri at St. Louis
Graduate Certificate in Logistics and Supply Chain Management

This certificate is designed to provide a focused and intensive study on the important areas of supply chain management and logistics. It is open for anyone who wishes to learn more about the field of supply chain management. Candidates are required to complete six courses. The courses are all classroom based.

University of North Florida
Certification in Transportation and Logistics

This certification helps candidates identify best practices in costing, pricing, cost reduction and productivity improvements. Recognized internationally, the CTL certification is ideal for professionals who have

experience working in the transportation and logistics industry. Those seeking this certificate are required to have a four-year degree or at least three years of experience in the area of transportation and logistics. Candidates are required to complete five modules. All modules are classroom based.

University of San Francisco
Advanced Professional Supply Chain Management Certificate
The Advanced Professional Supply Chain Management Certificate helps candidates understand the relationship between a company, the components of its supply chain and the role of the supply chain manager. The certificate is open for anyone who wishes to learn more about the field of supply chain management. Candidates are required to complete three courses, which are offered online.

Advanced Professional Sustainable Supply Chain Management Certificate
The Advanced Professional Sustainable Supply Chain Management Certificate helps candidates identify regulatory and sustainability issues within an organization and its supply chain. This certificate is ideal for professionals who have prior experience working in the field of supply chain management as well as those anticipating a career change. Candidates are required to complete three courses, which are offered online.

University of Texas at Dallas
Supply Chain Management Certificate
The Supply Chain Management Certificate helps professionals create value, provide solutions and excel in effective and real world decision-making. The certificate is open to anyone who wishes to learn more about the field of supply chain management. Candidates are required to complete four modules (eight days on campus and four days online).

Washington University in St. Louis
Supply Chain Management Certificate
The Boeing Center at Washington University's Olin Business School offers a robust portfolio of professional training courses and certificate programs designed to accelerate your career to the next level. The center offers ten-day Management Certificates in two different tracks designed to indicate that the participant has acquired knowledge of the leadership, strategy and skills necessary to become an effective manager of people and teams. The center also offers four six-day Skill Certificates in a variety of topics designed to provide participants with the knowledge and skills necessary for career advancement. Participants can also customize their areas of interest from a menu of a la carte training courses. A la carte courses are two days each, and currently include operational execution, successful project management, business model innovation and lean process management. ∞

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Editors note: The preceding list of supply chain management certifications was originally authored in 2015 by Praharsha Sunkara, who was then a graduate student at Texas A&M University, under the guidance of Malini Natarajarathinam. The list has been updated and expanded annually by the editors of Supply Chain Management Review *on an annual basis since its original publication date.*

SUPPLYCHAIN
MANAGEMENT REVIEW

TOP 50 3PLs

"Amazonization" driving change across the board

The inexorable advance of Amazon is creating new challenges for logistics managers who must meet heightened shipper expectations while navigating today's complex 3PL marketplace.

BY **PATRICK BURNSON**, EXECUTIVE EDITOR

O n both the domestic and global front, the consolidation trend in the third-party logistics (3PL) industry remains a gathering storm—with record merger and acquisition activity being reported across all sectors. In fact, many of the more notable deals took place late last year as more 3PLs aim to keep pace with the continued "Amazonization" of the global market.

Armstrong & Associates Top 50 U.S. 3PLs
(as of April 2019)

2018 Rank	Third-party Logistics Provider (3PL)	2018 Gross Logistics Revenue (USD Millions)*
1	C.H. Robinson	16,631
2	XPO Logistics	10,850
3	UPS Supply Chain Solutions	9,814
4	J.B. Hunt (JBI, DCS & ICS)	8,214
5	Expeditors	8,138
6	Kuehne + Nagel (Americas)	6,594
7	DHL Supply Chain North America	4,178
8	Coyote Logistics	4,000
9	Ryder Supply Chain Solutions	3,731
10	Hub Group	3,684
11	Total Quality Logistics	3,643
12	FedEx Logistics	3,170
13	DB Schenker (Americas)	3,025
14	Burris Logistics	3,022
15	Transplace	2,886
16	Schneider Logistics & Dedicated	2,711
17	Panalpina (Americas)	2,596
18	Landstar	2,542
19	Echo Global Logistics	2,440
20	CEVA Logistics (Americas)	2,427
21	DSV (Americas)	2,358
22	Penske Logistics	2,300
23	Transportation Insight	2,290
24	GEODIS North America	2,139
25	NFI	2,000
26	Worldwide Express/Unishippers	1,650
27	Americold	1,595
28	BDP International	1,552
29	Knight-Swift Transportation	1,550
30	Ingram Micro Commerce & Lifecycle Services	1,500
31	Werner Enterprises Dedicated & Logistics	1,465
32	GlobalTranz Enterprises	1,384
33	OIA Global	1,373
34	MODE Transportation	1,255
35	syncreon	1,165
36	Universal Logistics Holdings	1,148
37	SunteckTTS	1,110
38	Radial	1,082
39	APL Logistics (Americas)	1,075
40	TransGroup Global Logistics	1,020
41	Odyssey Logistics & Technology	1,018
42	Lineage Logistics	1,000
43	Ruan	957
44	Crane Worldwide Logistics	916
45	Agility (Americas)	886
46	Radiant Logistics	842
47	Nolan Transportation Group	811
48	U.S. Xpress	809
49	Cardinal Logistics Management	805
50	Nippon Express (Americas)	800

*Revenues are company reported or Armstrong & Associates, Inc. estimates and have been converted to US$ using the average annual exchange rate in order to make non-currency related growth comparisons.
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TOP 50 3PLs

Armstrong & Associates Top 50 Global 3PLs
(as of April 2019)

2018 Rank	Third-party Logistics Provider (3PL)	2018 Gross Logistics Revenue (USD Millions)*
1	DHL Supply Chain & Global Forwarding	28,120
2	Kuehne + Nagel	25,320
3	DB Schenker	19,968
4	Nippon Express	18,781
5	C.H. Robinson	16,631
6	DSV	12,411
7	XPO Logistics	10,850
8	Sinotrans	10,174
9	UPS Supply Chain Solutions	9,814
10	J.B. Hunt (JBI, DCS & ICS)	8,214
11	Expeditors	8,138
12	DACHSER	7,602
13	CEVA Logistics	7,356
14	GEODIS	6,645
15	Hitachi Transport System	6,283
16	Panalpina	6,156
17	Damco/Maersk Logistics	6,082
18	Toll Group	5,980
19	CJ Logistics	5,618
20	Bolloré Logistics	5,415
21	GEFCO	5,035
22	Kerry Logistics	4,875
23	Yusen Logistics/NYK Logistics	4,820
24	Kintetsu World Express	4,752
25	Agility	4,400
26	Coyote Logistics	4,000
27	Imperial Logistics	3,852
28	Ryder Supply Chain Solutions	3,731
29	Hub Group	3,684
30	Hellmann Worldwide Logistics	3,646
31	Total Quality Logistics	3,643
32	FedEx Logistics	3,170
33	Burris Logistics	3,022
34	Transplace	2,886
35	Schneider Logistics & Dedicated	2,711
36	Sankyu	2,639
37	Landstar	2,542
38	Echo Global Logistics	2,440
39	Penske Logistics	2,300
40	Transportation Insight	2,290
41	Mainfreight	2,110
42	NFI	2,000
43	Groupe CAT	1,990
44	Fiege Logistik	1,815
45	APL Logistics	1,730
46	ID Logistics Group	1,651
47	Worldwide Express/Unishippers	1,650
48	Americold	1,595
49	BDP International	1,552
50	Knight-Swift Transportation	1,550

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PENSKE | Rental
Leasing
Logistics

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For example, MNX acquired Network Global Logistics, creating a market leader in time-critical logistics, while Penske bought Old Dominion Truck Leasing, expanding its core leasing business. The market also saw RoadOne buy First Coast Logistics, bolstering its drayage network as well as Transportation Insight acquiring Nolan Transportation Group in an effort to double down on its truck brokerage and freight management. And finally, Lineage bought a string of cold storage companies including Service Cold Storage in a bid to challenge Americold.

According to Benjamin Gordon, managing partner at Cambridge Capital and BG Strategic Advisors (BGSA), there's also the geographic 3PL expansion designed to speed up delivery times. "Within the global context, it's important to observe that DSC Logistics was sold to South Korea's CJ Logistics," he says. "We also witnessed CFI, formerly Con-Way Freight and now a part of Transforce, acquiring Optimal Freight, resulting in a truckload and asset-based 3PL expansion to improve cross-border trade in North America."

In other global arenas, FedEx teamed up with Wirecard, providing payment processing and retail outlets in India and Germany. Meanwhile, AIT bought ConneXion World Cargo, bringing the UK-based forwarder into their fold. Panalpina added Skyservices in South Africa, with a focus on perishables, while Kerry Logistics went to Italy to buy Saga Italia, a specialist in oil and gas freight forwarding. Meanwhile, Kuehne + Nagel purchased Panatlantic Logistics in Ecuador.

Gordon maintains that shippers should also consider the changes made in other ground-based 3PL service sectors. "These came about as consequence of some obvious synergies," he says. "BNSF bought Unlimited Freight, adding flatbed capabilities. Pilot purchased Manna, gaining a last-mile foothold in furniture. Ryder bought MXD, becoming the No. 2 player in big and bulky e-commerce, while the Hub Group bought CaseStack, combining intermodal logistics with asset-light warehousing."

Trusting truckers is key, says TIA

According to a new whitepaper produced by Transportation Intermediaries Association (TIA), being a "shipper of choice" remains one of the most tired clichés in the current third-party logistics (3PL) market vernacular.

While hardly dismissing the value of having a special shipper relationship, the authors of "Creating a Win-Win-Win Business Relationship" maintain that 3PLs must nurture better partnerships with their motor carrier providers as well.

The expectations of shippers, 3PLs and carriers have traditionally moved in just one direction, states the TIA study. Results show that, in 2018, directional changes—made by both shippers and carriers—were made due to an industry-wide driver shortage and compliance with the electronic logging device (ELDs) rule. Increasingly, these factors changed the dialogue for all parties to meet driver expectations and to make the most of the 660 minutes of driving availability, the authors add.

Chris Burroughs, senior director of government affairs for the TIA, makes many of the same observations. He's especially adamant about ongoing collaboration in the U.S. "On the domestic front, TIA has seen a fundamental shift in the past 12 months, as 3PLs continue to strive to provide exemplary customer service not only for shippers, but for their motor carriers as well," he says.

"The customer today is buying drivers' hours," says Jim Ward, president and chief executive of D.M. Bowman, a full-service trucking and logistics provider based in Williamsport, Md. "We need to work with customers to best utilize time for the driving associate."

In TIA's "Win-Win" study, logistics managers reiterated the importance of trust, communication and loyalty by saying that those are the factors making it possible to solve today's challenges—even more so than technology in many instances.

"You still need the human interface," says J.J. Jones, chief supply chain officer of Monin Americas, a manufacturer of food and beverage flavorings with headquarters in Clearwater, Fla. "You need to talk to get things done."
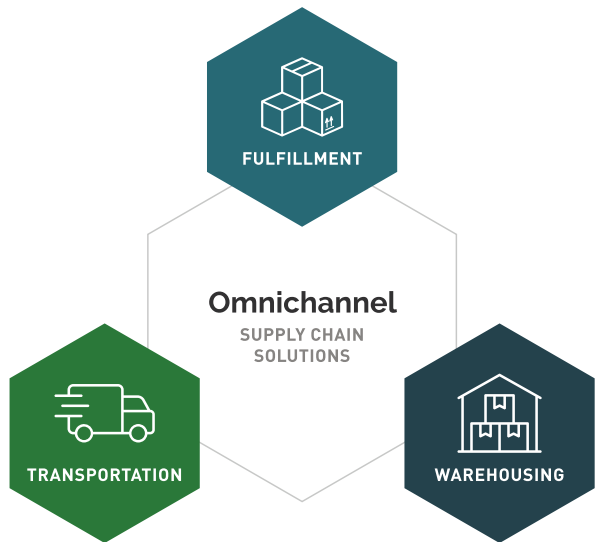
– Patrick Burnson, executive editor

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Meanwhile, other global merger and acquisition deals were technology-driven, says Gordon, who points to Project44 acquiring GateHouse, a Denmark-based business with European visibility data. Meanwhile, Australia-based WiseTech bought a string of U.S.-based customs brokerage technology companies.

Finally, there are the deals involving "logistics plus technology" to consider, says Gordon. "Yusen Logistics added ILG, gaining an e-commerce warehousing platform with more than 700 clients worldwide," he says, "and FedEx bought UK-based P2P Mailing, providing e-commerce transportation solutions, and expanding FedEx's cross-border capabilities."

The APAC factor

While all of these plot lines are likely to continue to develop over the course of 2019, Gordon says that the Asian Pacific (APAC) region deserves its own category.

"Alibaba and its logistics subsidiary, Cainiao Network, invested $1.4 billion in last-mile logistics company ZTO Express," says Gordon. "As large as this deal was, it was Alibaba's third such deal, after YTO Express and Best. Keep in mind that JD.com made a $115 million investment in China's second largest logistics real estate supplier, China Logistics Property Holdings."

Evan Armstrong, president of the 3PL consultancy Armstrong & Associates, certainly agrees with Gordon's assessment that China and the surrounding region will continue to demand considerable attention. "We see the APCA gaining even more traction, despite regulatory trade concerns," he says.

At last year's "3PL Value Creation Asia Summit" in Hong Kong, Armstrong and conference co-sponsor Global Supply Chain Council, reported that most global 3PLs identified China, India, and Southeast Asia as three of the key growth regions. "This certainly jibes with our current compounded annual market growth rate estimates of 11.4% for greater China, 11.6% for India, and 9% for Southeast Asia from 2017 to 2022," says Armstrong.

According to Armstrong, it was noted that North India and South India are very different, with the North having better logistics infrastructure and higher growth. China's Belt and Road Initiative (BRI) was also mentioned as having significant potential to drive growth over the next 10 years. "The new China-to-Europe railway was identified as a positive tailwind for future growth," he says. "At the same time, investors are driving much of the current merger and acquisition activity versus strategic buyers."

In Europe, which has a greater asset focus than the U.S., there are very few 3PLs of size worth buying, and Armstrong maintains that many are too small to be considered by strategic buyers. Meanwhile the U.S. is still dominated

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by investors buying non-asset based 3PLs and investing in new technologies to keep up with Amazon. Asia is seeing significant investment in cold-chain providers, e-commerce plays, and new logistics technologies.

"Buying warehousing infrastructure is becoming a way for investors to participate in 3PL market growth without direct investment," says Armstrong. "And there's a general desire for more collaboration between 3PLs. As I've mentioned before, this is 'coopetition' between 3PLs, where they partner with a logistics provider in some markets and compete with the same logistics provider in other markets. This is commonplace, especially in Asia."

Shipper requirements contained within the APAC are multicultural and quite challenging, Armstrong observes, saying that the issue is how to respond to this diversity and anticipate consumer needs. Major 3PLs are stressing targeted customer acquisitions. "The focus is now on targeting vertical industries and playing to a 3PL's strengths to deliver value for customers," he says. "Along with e-commerce, quality food distribution and chemicals were growth areas for warehousing and distribution in China. Apparel and footwear business is also growing well in China and throughout Southeast Asia."

Within APAC, "a tailored approach" needs to be taken to achieve geographic growth. Depending on the country, expansion may mean making specialized approaches to working with governmental entities and with locals at many levels. Joint ventures and partnerships are commonplace. "We feel that China and the U.S. have been barking at each other for long enough, and that a good trade treaty will finally be negotiated this year," concludes Armstrong.

The Amazon cunumdrum

The phenomenon of "Amazonization" refers to the wholesale disruption occurring across logistics and e-commerce platforms that was similar to the "Walmartization" that occurred across North America in the 1990s and early 2000s. Over the past 19 years, Amazon has more than quintupled in value.

Analysts for SJ Consulting Group, a Pittsburgh-based research and consulting firm, reckons that even though Amazon does not call itself a 3PL, it's driving unprecedented change within the industry. Like Armstrong, the analysts at SJ believe that Amazon's revenue model stemming from logistics services is "opaque."

Mark D'Amico, SJ Consulting's senior analyst, says that Amazon's one-day shipping announcement made in April may have "a counterintuitive consequence" for some 3PL competitors, as it could create opportunities for them to grow in a market that was long stagnant. "In short, Amazon's innovation and the customer expectations it drives are making ultimate success a question of who adapts quickest," he adds.

Like Armstrong, D'Amico believes that managing data and investing in fulfillment solutions is no longer an option for 3PLs. "It's a 'do or die' situation now," he says. "Digitization is for real." ∞

Patrick Burnson is the executive editor of Supply Chain Management Review