Peerless MEDIA, LLC

JANUARY/FEBRUARY 2015

SUPPLYCHAIN MANAGEMENT REVIEW®

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Is Your Supply Chain Ready for Global Growth?

As long as there have been boats and beasts of burden, intrepid business professionals, governments, and marauders have sought fame, fortune, wealth, and value by going global. Think the Phoenicians, Marco Polo, and the Vikings in days of old. Or in contemporary times, think of China, BRIC, EMEA, and other emerging markets. One could argue that outsourcing to China a few decades ago gave birth to supply chain management as we think of it today.

Indeed, the world is more interconnected than ever, which is a reason that some economists fret that challenges in economies abroad could put the brakes on domestic growth at home. As Eugenio Aleman, a senior economist at Wells Fargo told the *Wall Street Journal* in October: "The U.S. for now is growing on its own, but it cannot grow on its own in the medium to long term. We will need some help from the rest of the world."

Those kinds of sentiments have organizations, and their supply chain managers, asking two important questions: Where should I look next for growth, and is my organization up to the challenges posed by sourcing or manufacturing and distributing abroad?

Those are among the questions our cadre of writers set out to answer in this issue of *SCMR*. For instance, *Where's the Next China*, a column from Loyola University Chicago's John A. Caltagirone and Anjali Menon that helps readers put that question into context. Anyone contemplating setting up shop in the next China will want to read *Ready for Business: The Challenge of Globalization*. Collaborators from the University of Tennessee and the ESSEC Business School in Paris provide a framework to help supply chain managers assess the readiness of global locations to support their supply chain operations.

Bob Trebilcock, Editorial Director
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Also this month, we offer practical advice on the role your supply chain can play in protecting your IP in a global market, avoiding increasingly heavy fines for non-compliance, and structuring a supply contract in China's evolving legal system that could serve as a template for other emerging countries.

Rounding out the issue, and closer to home, Russ Meller provides case study examples of companies that have invested to speed up their distribution processes and gain a competitive advantage, while CPO Hamish Walker details procurement's role in product innovation at Molson Coors.

Finally, this month we're including an online bonus column from APQC. Regular readers are familiar with our *Benchmarks* column from APQC's Becky Partida. While this issue focuses on global management, we didn't want to miss out on the column. Electronic subscribers can access it at scmr.com.

As always, I look forward to hearing your comments or suggestions for future stories in *SCMR*.

Bob Trebilcock

SUPPLYCHAIN MANAGEMENT REVIEW

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SUPPLYCHAIN MANAGEMENT REVIEW

FEATURES

10 The Challenge of Globalization
Nearly every organization today is expanding its global footprint, but many are discovering that not all regions are ready for global business, according to a team of authors from the University of Tennessee and the ESSEC Business School in Paris. The EPIC framework they present provides a structure to help supply chain managers assess the readiness of global locations.

20 The Role of Global Trade Compliance in Market Expansion
Compliance with global trade regulations is rapidly becoming much more than an exercise in risk management. Increasingly, it is a strategic capability that can help companies establish enduring competitive advantage. Jennifer Wade provides a glimpse of the upside of effective global trade compliance, and a look at how to rethink the supply chain roles of compliance experts.

28 Contracting in China: A Contract Worth the Paper it's Written On
Supply chain contracts in emerging markets like China were once not worth the paper they were written on. But, that's changing, write Chris Carr and Dan Harris, two attorneys with global supply chain experience. As the market and legal systems mature, savvy organizations are using contracts to protect their global supply chain's integrity

34 Supply Chain's New Role in Protecting Your IP
Intangible assets and intellectual property (IP) are increasingly important in today's knowledge-based economy. Yet, all too often protection of a company's intellectual capital is controlled by the legal department, with most companies failing to take effective action to protect IP a priori. Stanford's Barchi Gillai, Sonali V. Rammohan, and Hau L. Lee explain how organizations can find value from basing IP protection on more proactive supply chain practices, and on embracing a holistic approach to target social, environmental, and ethical responsibility throughout the supply chain.

40 Fulfillment as a Competitive Advantage
Many companies are working to reduce the time it takes to get an order to a customer's home and replenish their stores. But while faster fulfillment make marketing, customers, and store managers happy, it comes at a cost. Fortna's Russ Meller discusses companies that built a business case for faster fulfillment and found the benefits far outweigh the investment costs.

46 How They Did it: Procurement Innovation at Molson Coors
In many businesses, innovation is driven through marketing and engineering. At Molson Coors, procurement has deployed a five step process to drive innovation at one of the country's best-known brewers.

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Supply Chain Management Review® (ISSN 1521-9747) is published 7 times per year (Jan/Feb, Mar/Apr, May/Jun, July/Aug, Sept/Oct, Nov, Dec) by Peerless Media LLC, a Division of EH Publishing, Inc., 111 Speen St, Ste 200, Framingham, MA 01701. Annual subscription rates: USA $199, Canada $199, Other International $241. Single copies are available for $60.00. Send all subscription inquiries to Supply Chain Management Review, 111 Speen Street, Suite 200, Framingham, MA 01701 USA. Periodicals postage paid at Framingham, MA and additional mailing offices. **POSTMASTER: Send address changes to: Supply Chain Management Review, PO Box 1496 Framingham MA 01701-1496.** Reproduction of this magazine in whole or part without written permission of the publisher is prohibited. All rights reserved. ©2014 Peerless Media LLC.

InSIGHTS

BY LARRY LAPIDE

Now Cheaper, But not "Cheap Oil"

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

This column represents the annual oil update I've been writing since my first column in the January/February 2007 *SCMR* issue ("Is Your Supply Chain Addicted to Oil?"). Since then, I've been steadfast in my advice to supply chain managers to constantly wean their supply chains off oil-based consumption because the price of oil would go up as well as be more volatile over the long-run (defined as at least a decade). However this year's turmoil in the oil industry (largely driven by the U.S. producing more oil from fracking) gave me some pause before I put pen to paper. I questioned whether the advice I first offered in 2007 is still sound today.

Back in 2007, most supply chains had evolved significantly during the "Era of Cheap Oil" that ran for almost 20 years, from the late 1980s until late in 2004. This period also overlapped with the heyday of the Supply Chain Management (SCM) revolution that began in the mid-1990s. From that time, companies started to alter their networks to embrace the integration and globalization of supply chains, leveraging "Cheap Oil" to minimize costs and inventories. The evolving supply chains included more plastics-based products, wrapped in even more plastics. Supply lines were more fragmented and longer, and this led to the greater use of oil-based energy to transport goods around the world with little abandonment, that is lots of materials, components, and finished goods too-often were transported half-way around the world to their point of consumption.

The end of Cheap Oil was brought about by long-term supply-demand issues. The increasing demand for oil from developing economies around the world (such as China) as well as the use of more costly oil extraction techniques (such as shale fracking, tar sands extraction, and deep-water drilling). This portended a future of increasing oil prices in the long-run as a result of increased global demand and more expensive supply. Thus my advice to managers was to revisit their supply chains over time and evolve them to being cost and oil-efficient, rather than cost and inventory efficient.

The Long View

As I write this column, the Brent crude price is around $69 per barrel and the Saudi government is maintaining that the price of oil might bottom out at $60 or less after having dropped steadily since its mid-2014 price hovering at around $110 per barrel—almost halving. The U.S. media is reporting that gas stations have started selling automobile gasoline at prices not seen by consumers for quite some time. So some people are starting to sing "Happy Days Are Here Again," with the prospects of a return to the Era of Cheap Oil. But, that era is not back.

Exhibit 1 graphically depicts quarterly crude oil prices over a 40-year time frame—starting shortly after the 1973 Arab Oil embargo, which resulted in significant shifts in the thinking about the power of the Middle East oil producers, and their role in global economics and geopolitics. The graph shows real prices as well as inflation-adjusted nominal prices (in terms of November 2014 dollars). From the graph, one can see that current prices are cheaper, but not Cheap Oil. It also appears that current prices are probably ephemeral.

During the Era of Cheap Oil, the price of oil was volatile yet averaged only around $30 per barrel. So, even if the Saudi prediction is achieved this would still mean that prices have doubled from Cheap Oil prices (after being adjusted for inflation). They are certainly cheaper than in recent times, however, they are hardly Cheap Oil prices. Moreover,

the current price is even higher—in fact, it is 230 percent times the Cheap Oil price. Looking at the pricing history post-Cheap Oil one sees increasing price volatility as there was a run up of prices to $116/barrel followed by steep declines in late 2008 and in early 2009 (from the effects of the Great Recession) to a bottoming out to $41. This bottom-level price was followed by a return to prices hovering around $100.

During the ups-and-downs and increases, many pundits said these were largely due to oil speculators. It's funny that no one is claiming that the current drastic price decreases are due to oil speculation. Instead the pundits attribute it optimistically to a sustained surge in U.S. oil production. Some normal volatility is due to oil speculation, however, the very big swings in price are supply-demand issues happening in an environment of limited refinery capacity. The post Cheap-Oil run-up was due to the long-term increase in global demand in concert with more expensive oil extraction. The steep decline in 2008-2009 was due to the Great Recession. Lastly, the current low prices are due to an excess of supply from the rapid growth in U.S. shale oil production. However, this will likely be short-lived.

I suspect that once the excess oil supply runs off, prices will increase back to the $100 level because many fracking and tar sand extraction operations will not be profitable at current pricing. In addition, many oil producing country budgets are balanced at close to $100/barrel. Some oil suppliers have already turned off their unprofitable drilling sites—for example, the cost of fracking for oil varies greatly on how easy it is to extract oil from deep within the Earth surface. After the runoff and the global economy starts to improve, the price of oil will continue its long-term increase, with greater volatility.

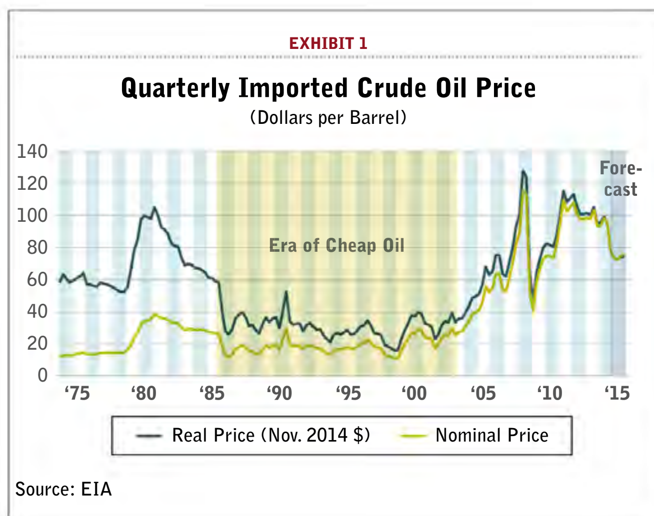
Continue Weaning Off Oil

Given that while current oil prices are low and may be for some time, yet still significantly above Cheap Oil prices, the advice I've been giving since 2007 is the same. That is: Continue to wean your supply chains off oil. As consumers, managers will enjoy lower automobile gas prices in their personal lives for a bit of time. In their business lives, however, there are two major areas in supply chains from which they should continue over the long-term to squeeze oil out.

The first is in the area of product and packaging material composition. During Cheap Oil, material composition moved from glass, metal, ceramics, and paper to plastics. Post-Cheap Oil there has been a gradual shift back to the use of these other materials over time; especially in the area of packaging where many shippers have been using paper and cardboard to replace plastic peanuts and shrink-wrapped products and pallets being transported.

The second and biggest area of consumption of oil is in transportation, especially diesel fuel. Post Cheap Oil there have been a variety of initiatives to lower oil consumption. Slow steaming in ocean freight, while initially not welcomed by shippers, is gaining acceptance over time. Ocean carriers are convincing them that adding a few days to long ocean lanes helps to hold down freight cost increases. Because fracking for natural gas has made the U.S. its largest supplier, transportation equipment manufacturers have started to produce vehicles and trucks that run on liquid natural gas in place of oil-based diesel.

In addition, e-tailers are more reluctant to provide free shipping on e-commerce orders. Giving away shipping costs to consumers was getting more costly for them as the oil price increased from Cheap Oil levels. Amazon, for example, first increased its free-shipping minimum order size from $25 to $35, and lately has been pushing an ongoing service called Prime to help recoup the cost of so-called free shipping. Lastly, as the price of oil rises, and U.S. energy costs stay relatively low compared to countries around the world, more U.S.-based manufacturers are considering re-shoring their operations closer to home and in the U.S.



When it comes to transportation, basic principles dictate that oil efficiency translates to shipping inbound and inter-facility goods over longer lanes and in bulk with customer-facing orders shipped over shorter transport lanes. These are more oil efficient as it fosters greater use of ocean rather than air transport, rail/barge more than truck, and truck over parcel shipments. While this slows down supply chains, and might lead to an increase in inventories, better planning and inventory management will be needed to mitigate potential increases.

In summary, while I indeed took pause before I wrote this column, my analysis leads me to the same opinion: Over the long-haul stay the course and continue squeezing oil out of your supply chains.

Supply Chain Innovation Critical in Ebola Response

By Jarrod Goentzel

Jarrod Goentzel, Ph.D., is director of the MIT Humanitarian Response Lab. He can be reached at goentzel@mit.edu

Walk through the recently built UNICEF warehouse in Copenhagen, Denmark, and you will pass a room where office cubicles have been replaced with rolling tables, white boards, colorful couches, and a mix of gadgets and gizmos. This is the home of the organization's Innovation Unit.

The fact that the unit is embedded in the supply chain function underlines the emphasis that UNICEF puts on developing innovative processes and grounding new product ideas with operational realities; a culture normally associated with leading companies.

This culture is central to the fight against the Ebola outbreak in West Africa. UNICEF is developing new ways to deliver the large volumes of supplies it ships, and is providing a critical conduit to support Ebola Treatment Units (ETUs) and Community Care Centers (CCCs). By October 8, 2014, more than 900 metric tons of supplies were delivered to the region in support of partners, through a total of 73 flights, according to UNICEF.

UNICEF's culture of supply chain innovation offers much hope not only for the battle to halt the Ebola virus, but for humanitarian efforts generally.

Vital Capacity

Supply chain capacity is vital in the Ebola response. Because there is not yet a proven treatment or vaccine, we must halt the outbreak using public health measures that have worked over the past 40 years: rapid diagnosis for suspected cases; treatment, isolation, and contact tracing for confirmed cases; and safe burial for victims. The most critical aspect in implementing these measures is protection for the health workers who provide these and other vital services. Affording that protection depends on a reliable supply chain.

The primary challenge is scale with over 15,000 reported cases by November 20. Previously, the largest outbreak of Ebola was 425 cases. In addition to scale, the Ebola response creates unique supply chain bottlenecks, and requires the services of experienced logisticians such as those at UNICEF.

Leveraging a culture of innovation rooted in the operations of a warehouse, UNICEF is using process innovation—adapting standard processes and practices—to meet these challenges. This is happening across the supply chain in dealing with transportation constraints, supplier lead times, and a new product launch.

Transportation Constraints

When the Ebola outbreak surged in West Africa in late July 2014, many commercial airlines began cancelling flights. The reasons varied, from government requirements to the difficulties in making provisions for ground services for airlines' equipment and staff. By August 25 there were only two commercial airlines serving Liberia: Royal Air Maroc (with three flights per week) and Delta (which halted service August 31). Fortunately, Brussels Airlines was able to resume flights in early September, and faced a backlog of freight that forwarders were trying to book.

The outbreak placed unique constraints on passenger travel, and on the cargo capacity that went along with it. Although the Ebola emergency is very different than a natural disaster like an earthquake or hurricane, this transportation bottleneck changed the supply chain in a similar way as infrastructure damage at an airport, and severely limited throughput capacity. Instead of repairing infrastructure, the focus in this emergency was to replace commercial air services.

UNICEF identified providers that could work within the restrictions and ground constraints to offer cargo charters into the country. They worked with the Liberia Ministry of Health and Social Welfare (MOHSW) to quantify and prioritize supplies and with various donors to provide funding

for the flights. They staged the items at the Copenhagen warehouse in order to fully utilize the dedicated charter capacity. They booked flights on a regular schedule to provide a continual flow of critical supplies, enabling the organization to adjust to MOHSW needs. In setting up this air bridge, and combined with operations in other countries, UNICEF marked a record for monthly shipments.

Supplier Lead Times

When the Ebola outbreak reached the U.S. in September via a traveler from Liberia, news coverage amplified the fear and accelerated the preparedness efforts for a number of organizations. Throughout October, demand for personal protective equipment (PPE) for health workers spiked. Stock prices surged for specialized manufacturers such as Lakeland Industries.

A surge in key supplies during an outbreak is not expected. In fact, UNICEF identified supplier lead times as a potential issue about one month earlier. As they were ramping up their supply chain in August, UNICEF was in close communication with manufacturers. By early September, the organization reported on the issue of manufacturing capacity for PPE and began more formal coordination with key suppliers.

UNICEF has been developing a process of close industry interaction for critical supplies over the past several years. In anticipation of the need to rapidly scale up supply for an emergency, they provide long-range forecasts, consult with suppliers, and establish Long Term Arrangements (LTAs). The LTA defines terms and conditions (product, price, etc.) over a period of time for a projected total volume. It is not binding but provides a fast-start foundation for contractual obligations that commence with a purchase order. This long-term commercial partnership is established with a non-exclusive set of suppliers as a result of a competitive bidding process, usually launched with a prebid event involving several suppliers.

UNICEF has cultivated this process over several years for products for situations where demand can suddenly spike for humanitarian purposes and there is limited global manufacturing capacity. Examples include Ready-to-Use Therapeutic Food (RUTF) that provides essential nutrition during a famine and Long-Lasting Insecticidal Nets (LLINs), which are critical in preventing malaria. UNICEF adapted its supplier collaboration process for the PPE in the Ebola response, conducting an industry consultation on November 11-12.

Supplier management is not necessarily innovative for many commercial supply chain leaders. But the ability to cultivate close supplier relationships and negotiate terms prior to, or in this case in the midst of, surging demand from a humanitarian crisis takes this practice in a new direction.

New Product Launch

In addition to scaling up its supply chain, UNICEF also conducted a new product launch. This new product was not targeted at the health facilities, but at households providing care while these facilities were constrained.

For example, during the peak of the crisis, Liberia did not have enough beds in ETUs to treat all patients with a confirmed Ebola diagnosis. With limited capacity, family members who were left to provide care for loved ones faced extreme risk.

Working in collaboration with the MOHSW and with funding from USAID and the Paul G. Allen Family Foundation, UNICEF created "household protection kits" for these caregivers. Each kit contained protective gowns, gloves and masks, soap, chlorine and a sprayer, and instructions on the use and safe disposal of materials.

The ability to cultivate close supplier relationships and negotiate terms prior to, or in this case in the midst of, surging demand from a humanitarian crisis takes this practice in a new direction.

While none of these items was innovative, the kit was new. Fortunately, when designing its global humanitarian warehouse with state-of-the-art automation, UNICEF also created a very flexible space for workers to assemble kits. This postponed production space is particularly critical for unique emergency kits that can only be assembled in reaction to needs identified in a dynamic crisis. UNICEF also had a flexible workforce ready to respond to the surge in labor requirements. On September 20, the organization issued a call to the Copenhagen community for a "massive scale-up of UNICEF kit packing." The 9,000 kits assembled on Saturday arrived via airlift the following Wednesday.

More Innovation Needed

These examples from UNICEF are illustrative. Much of the innovative work on the ground in West Africa will only become apparent after the crisis has ebbed and the people driving the efforts have time to document them.

When faced with a daunting challenge, people often look for a silver bullet in the form of a new technology. In fighting Ebola, this may prove to be the case, and we encourage innovation through efforts like the USAID Fighting Ebola grand challenge. To date, however, the progress of slowing the exponential growth in Ebola cases has ridden on the back of the innovative supply chains being implemented by organizations like UNICEF. We must maintain this focus and support ministries of health in West Africa to strengthen their supply chains.

GLOBAL LiNKS

BY PATRICK BURNSON

Emerging Nations Lose Their Luster with Evaluation of Risk and Reward on Localization

Will U.S. manufacturers begin to rethink their sourcing strategies as nearshoring and onshoring become more attractive? It depends on who you talk to.

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

A new study from the University of Tennessee's Global Supply Chain Institute suggests that there may be a reversal of outsourcing trends in the coming years as U.S. companies test the local waters. Research by The Boston Consulting Group (BCG) comes to a similar conclusion, while contrarian analysts at AlixPartners sound a note of caution.

Reducing total landed cost was the goal of many U.S. companies moving manufacturing to Asia in the past decade. But that may have been a faulty proof, say researchers at UT's Global Supply Chain Institute. Evidence from new research, suggests a more localized supply chain for many products may soon be making a comeback.

"Countless factors can harm performance when supply chains are stretched across the globe," says Ted Stank, UT Bruce Chair of Excellence and one of the co-authors of the study. "The most successful companies evaluate the local variables before jumping into a global supply chain and design a dynamic network less vulnerable to the pitfalls of modern globalization."

The report represents the fourth installment in the *Game-Changing Trends in Supply Chain* series from UT's supply chain faculty. It utilizes a framework of key national characteristics that appeared in *Global Supply Chains: Evaluating Regions on an EPIC Framework*, a book Stank co-authored with other faculty from UT and ESSEC business school in Paris (Stank and his co-authors also wrote *The Challenge of Globalization* in this issue of *SCMR*). Ten companies, with industries ranging from materials refining to health care, were then interviewed for the study. Real world examples of their experiences are presented to demonstrate best practices in global supply chain network development.

Stank adds that streamlined, global supply chains are still efficient for companies with complex technology and low logistical costs. However, supply chain network design must change and adapt as the world changes and adapts. The report highlights communication and visibility across the entire supply chain as a consistent element in successful businesses.

The research posits the notion that global supply chains will eventually break into a series of "pods" where regional procurement and manufacturing will supply the demand centers of the area with a significant percentage of its production needs.

Made in the USA

Meanwhile, new research by BCG comes to an even more startling conclusion. U.S.-

based executives at large companies remain bullish on American manufacturing, and their actions are starting to reflect their enthusiasm.

The firm's third annual survey of senior manufacturing executives at companies with sales of $1 billion or more found that the number of respondents who said that their companies are already bringing production back from China to the United States had risen 20 percent—from roughly 13 percent to 16 percent—in the past year. The number who said that they would consider returning production in the near future climbed 24 percent—from about 17 percent to 20 percent. And a majority (54 percent) expressed interest in reshoring, validating last year's result (also 54 percent).

"These findings show that not only does interest in repatriating production to the U.S. and creating American jobs remain strong but also that companies are acting on those intentions," says Harold L. Sirkin, a BCG senior partner.

Respondents predicted that the U.S. would account for an average of 47 percent of their total production in five years, reflecting a 7 percent increase in U.S. capacity compared with last year's results.

In addition, respondents predicted that the U.S. would account for an average of 47 percent of their total production in five years, reflecting a 7 percent increase in U.S. capacity compared with last year's results. Only 11 percent of their capacity would be in China, a 21 percent decrease from last year. Respondents forecast that the share of production in Mexico, Western Europe, and the rest of Asia would also drop.

By a three-to-one margin, respondents also predicted that reshoring would create U.S. manufacturing jobs within five years. Fifty percent of the respondents said that they expect to boost their U.S.-manufacturing workforces by 5 percent or more. Only 17 percent predicted that their companies would be employing at least 5 percent fewer manufacturing workers in the U.S. five years from now. The survey reinforces a previous BCG estimate that reshored production, along with rising exports, could create between 600,000 and 1 million direct manufacturing jobs by 2020.

Sobriety Check

Finally, a contrarian—and perhaps more sober view—on the "American manufacturing is back" enthusiasm is reflected in yet another recent survey. According to AlixPartners, the global business advisory firm, it pays for companies to separate the hype from the actual harvest when it comes to any manufacturing-sourcing decisions. Analysts here maintain that the real value of "what to source and where" will always depend on a thorough examination of the company's individual circumstances.

The AlixPartners survey finds that, for the first time in the four year history of the annual survey, the United States has surpassed Mexico as the preferred location for either the reshoring or nearshoring of previously offshored manufacturing for U.S. consumption. In this year's survey, 42 percent of manufacturing executives said they would choose the U.S. as their preferred location, up from 37 percent in last year's survey, while those who said they would choose Mexico (among various countries and regions in the Americas) dropped to 28 percent this year, from 37 percent in last year's survey and from 49 percent in AlixPartners' previous survey.

However, while America's comparative attractiveness has certainly increased, the study also points to several challenges. For instance, when the executives were asked the biggest challenges they have faced or expect to face with reshoring or nearshoring their operations, among the leading concerns cited were availability of skilled labor, quality of work, local government regulations, and labor law issues.

Foster Finley, managing director at AlixPartners and leader of the firm's Supply Chain Practice in the Americas, agrees with the UT and BCG reports that point to a more competitive homeland. Still, he advises that the decision as to where to source manufacturing should always be a clear headed one.

Today's global supply chain manager must still take into account long-term considerations such as type of individual products and capability of the local workforce, says Finley. Then they can evaluate the capability and flexibility of suppliers and whether current open capacities might quickly close if they suddenly lose government subsidies.

"And those are just a few of the myriad other issues," he says. "Companies should look before they leap."

Global Supply Chain Operations:

A Region-by-region

Nearly every organization today is expanding its global footprint, but many are discovering that not all regions are ready for global business. The EPIC framework provides a structure to help supply chain managers assess the readiness of global locations to support their supply chain operations.

By Theodore (Ted) Stank, Philippe-Pierre Dornier, Kenneth J. Petersen, and Mandyam M. Srinivasan

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On April 15, 1981, Coca-Cola Company opened its first bottling plant in China since the communist revolution in 1949. On that date, chairman Roberto C. Goizueta noted that it was "…one of the most important days … in more ways than one, in the history of the world." Regardless of whether or not that bold statement holds true, the return of Coke's manufacturing operations to China provides an example of how firms are implementing strategies that meet the needs of both developed as well as developing world markets.

To support this marked trend towards globalization, supply chain management has become an increasingly important function for firms that operate with a global footprint, regardless of size or location. What is true for large companies is also true for small- and medium-sized enterprises (SMEs). When a Turkish SME decides to go outside its domestic market to Africa, for example, it has to master not only the African market but also the way it manages the supply chain in this region.

The scope of global supply chain operations is increasing as firms expand their global footprint. According to The World Economic Forum, the ratio of trade to GDP for the world as a whole has increased from 39 percent in 1990 to 59 percent in 2011. Such globalization led to the rapid ascent of developing nations in the early part of the 21st century. Without question, firms in one nation increasingly depend on firms from other nations for the supply of material and services as well as for access to consumer markets. In fact, research into market trends has suggested that supply chains across the world will evolve into a series of regional demand and supply "pods" where regional procurement and manufacturing operations will supply the major demand centers of the area, at least for a significant percentage of production requirements.

For any company looking to expand its global footprint, these trends raise an important question: How ready are

Assessment of Readiness

the supply chain capabilities in the region where I would like to set up shop? More importantly, how can I, as a supply chain manager, make those assessments?

To that end, this article introduces the EPIC framework. It is a structure that will help supply chain managers assess the readiness of global locations to support supply chain operations based on four dimensions: Economy (E), Politics (P), Infrastructure (I), and Competence (C).

Assessing Supply Chain Readiness Across Regions

The EPIC framework was developed in part because the market trend towards both globalization and regionalization (regional demand and supply pods) creates the need for tacit knowledge about how to operate in this increasingly complicated global/regional/local environment. Most firms are generally not adept at making decisions that optimize the interactions between the many complex

drivers that are in play. For instance, corporate strategies often view the problem of managing global logistics as an afterthought, ignoring the potential negative impact on profit margins and asset investments that may be required to support a global initiative. If you consider the other supply chain costs that can vary across borders, such as order processing, materials acquisition and inventory, supply chain planning, supply chain financing, and information management, the potential erosion in profit margin is significant.

Supply chain managers attempting to build and operate efficient effective global supply chains must juggle a multitude of issues that include the risk of supply chain disruptions, governmental rules and regulations in the countries involved, supply chain competencies, and infrastructure issues within these countries. Most managers, however, don't have the luxury of spending time "in country" to learn the nuances of these issues prior

TABLE 1

EPIC Assessments

	Economy	Politics	Infrastructure	Competence	Overall Grade
Region 1: East Asia					
China	A	C+	C+	B+	B
Hong Kong	B+	A	A	A	A
Japan	B	A-	B+	A-	B+
South Korea	B+	B+	A-	B	B+
Taiwan	B+	B+	B+	A-	B+
Region 2: South Asia					
Bangladesh	B-	D	D-	C-	C-
India	B+	C+	C-	B	B-
Pakistan	B-	D	C-	C+	C
Region 3: Southeast Asia					
Indonesia	B+	C-	C–	B–	C+
Malaysia	B+	B–	B+	A–	B+
Myanmar	B	D–	D–		
Philippines	B+	D+	D+	B–	C+
Singapore	B+	A–	A	A	A–
Thailand	A–	C+	D+	B	B
Vietnam	B	C+	B+	C+	C+
Region 4: Australia					
Australia	B+	A-	B+	B+	B+
Region 5: Middle East and North Africa					
Algeria	B-	D	C-	D-	C-
Egypt	B+	C	C	C-	C+
Israel	B	B+	B	B+	B
Saudi Arabia	B+	B-	B+	B+	B+
United Arab Emirates	B	B+	A	A	B+
Region 6: Sub-Saharan Africa					
Angola	B-	D_	D-	D	D+
Dem. Rep. Congo	B-	F	F	F	D
Ethiopia	B-	C-	D+	D	C-
Kenya	C+	D+	C-	C-	C-
Nigeria	B+	D	D	D+	C-
South Africa	B	B-	B-	B-	B-
Sudan	C+	F	D	D-	D

to making decisions. Failing to understand the complexity and nuances of a region or nation could have serious consequences, such as labor challenges and higher procurement costs.

Thus, managers increasingly are pushed outside their comfort zones when making global supply chain decisions, rendering the ultimate success of global business initiatives as "hit or miss" propositions. The challenge for them is to be able to understand the intricacies of the supply chain environment of a specific region or country without a framework to help them master issues such as supply chain design and key constraints that enables better decision-making.

We believe global supply chain managers can benefit from a methodology that will help them assess their options in supporting global initiatives, identifying the strengths, weaknesses, opportunities, and threats of the different regions in the world—a framework that can help managers manage supply chains in both emerging and mature markets.

The EPIC Framework

The EPIC framework assesses the four key dimensions of a nation that are critical to managing efficient and effective supply chains. Each of these dimensions is evaluated using a number of variables to arrive at a weighted score for that dimension. In turn, the scores on these dimensions are used to arrive at a weighted score for the country.

Economy. The Economy dimension assesses the

Region 7: Western Europe					
Austria	B	A	A-	A-	B+
France	B+	B+	A-	B	B+
Germany	B+	A-	A	A-	A-
Italy	B	B	B-	C+	B-
The Netherlands	B	A-	A	A-	A-
Spain	B+	B	B+	B-	B-
Sweden	B	A	A	A-	A-
Turkey	B+	C+	B-	B-	B-
United Kingdom	B	A	A	A	A-
Region 8: Central and Eastern Europe					
Czech Republic	B	B+	B	B-	B
Hungary	C+	B-	B-	C+	B-
Poland	B+	B+	C	B-	B-
Romania	B-	C+	D	C	C
Russia	B+	C-	C-	C-	C+
Ukraine	B	D	C-	C	C
Region 9: North and Central America					
United States of America	B+	A-	B+	A	A-
Canada	B+	A	B+	A-	A-
Mexico	B+	C+	C+	B-	B-
Costa Rica	C+	B	C-	B-	C+
Panama	B	C+	B+	C+	B-
Region 10: South America					
Argentina	B	D+	C-	C	C
Brazil	A-	C+	C-	B-	B-
Chile	B+	B+	B	B	B+
Colombia	B+	C	C-	C+	C+
Peru	B+	C	C	C+	B-
Uruguay	B-	B	B-	C-	B-
Venezuela	C+	D-	D	D	D+
Source: By Theodore (Ted) Stank, Philippe-Pierre Dornier, Kenneth J. Petersen, and Mandyam M. Srinivasan					

economic output of the country, its potential for future growth, its ability to attract foreign direct investment, and how well it can generate a steady return on investments made in the country. The variables used to assess the Economy dimension are the Gross Domestic Product (GDP) and its growth rate, the population, foreign direct investment (FDI), exchange rate stability, consumer price inflation, and the balance of trade.

Politics. The Politics dimension assesses the political landscape with respect to how well it nurtures supply chain activity. The variables considered in the Politics dimension include the ease of doing business, bureaucracy and corruption, the legal and regulatory framework, tariff barriers, the risk of political stability, and intellectual property rights. These variables influence the environment within which supply chains operate.

Politics is particularly important in the initial implementation phase of a supply chain project, as it requires managers to have knowledge of the country and ports from which products will be imported, the safest location for warehousing facilities, and so on. Costly delays can result from such issues as licensing, hiring, and environmental compliance. Furthermore, the encoding of cultural and historical norms in the laws of the nation forms the legal framework for operations. Issues related to taxes, wage rates, regard for intellectual property, and regulations related to hiring and firing are all issues that managers have mentioned as being amongst the most difficult when operating in a global setting.

Infrastructure. The Infrastructure dimension tracks variables that strongly influence how supply chains in the country are managed and operated, and represents the potential for leveraging these activities. The variables considered in the Infrastructure dimension can be broadly classified into three categories, the physical, energy, and telecommunication infrastructures. The physical infrastructure covers the roadways, the railway network, and air and water transportation. The energy infrastructure is responsible for the supply of electricity and fuel. The telecommunications infrastructure is captured by the extent of telephonic and internet-based activity.

Decisions on infrastructure require a sound understanding of geography. Roads over tall mountains, across large deserts, and through jungles and marshes generally are not very effective or efficient. In addition, access to stable electricity, water, and telecommunications is essential. Even if a firm does not operate in an emerging market, it is likely that one or more of its suppliers do. As a result, supply chain managers must be knowledgeable about the conditions in which those suppliers operate so as to ensure top overall supply chain performance.

Competence. The Competence dimension assesses the general supply chain skill levels of both the work force and the logistics industry within a country that is available to firms seeking to manage supply chain activities within – as well as into and/or out of – the country. The variables used to assess the Competence dimension are labor productivity, labor relations, the availability of skilled labor, the education level of line staff and management, the logistics competence, and the speed with which customs and security clearances take place.

Assessing 55 Nations Across the Globe

The scoring system outlined above provides a grade for each variable. However, it must be emphasized that while the EPIC assessment provides a score for a country, it is not an absolute measure of the desirability or maturity level of that country from a supply chain perspective. It is essential to also understand other factors such as the history of each geographic region so that the reader can appreciate cultural roots and their implication for supply chain management in these different regions.

Data used to assess the majority of the variables in the EPIC framework were derived using results from in-depth studies conducted by established organizations. These studies include the World Bank's Ease of Doing Business Index (EDBI) and World Governance Indicators (WGI), the Central Intelligence Agency's CIA World Factbook, and the World Economic Forum's Global Competitive Index (GCI). Table 1 provides the EPIC assessment for 55 countries that were included in the analysis. This table is organized along 10 distinct geographic regions: East Asia; South Asia; Southeast Asia; Australia; Middle-East and North Africa; Sub-Saharan Africa; Western Europe; Central and East Europe; North America; and South America. See the table on page 12.

Strategic Imperatives: Know Before You Go

Supply chain managers must have the knowledge and information necessary to coordinate multiple inputs and outputs because the physical design of their supply chain networks often involve several enterprises spread across many countries. These managers will have to learn how to mitigate the significant time delays and cost distortions that often accompany supply chains spread across the globe. Understanding key variables in the macro-environment can help supply chain managers better understand the global supply chain environment and lead to better decisions and lower levels of uncertainty and risk. The following represent strategic imperatives that emerged from the EPIC assessment to help supply chain managers better understand key macro-environmental variables and trends.

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Standardized Solutions Across Regions are an Illusion

The EPIC assessment results support the notion that there will be a period of "semi-globalization" in business, where distance matters and different standards will persist across regions. Given the differences in geography and regulations, infrastructure, service level expectations, and competence of logistics service providers between different countries, it certainly cannot be expected that supply chain operations in different countries will be comparable. As a result, global supply chains will have to primarily deal with regional pods of demand that present unique supply challenges, rather than working with one standard global supply chain footprint.

The Role of Supply Chain

One truism of supply chain management is that supply chain managers typically do not influence highest-level strategic business decisions. Rather, they are required to manage the resulting supply chain structure with the set of constraints predicated by such strategic decisions. In this sense, supply chain managers tweak the knobs of the system to get the best performance, but others set the overall objectives. This may be changing in some leading edge organizations, but for the most part strategic business decisions are made based upon one or more dominant criteria, such as the size and growth rate of consumer markets, the labor and capital costs of manufacturing, or the cost of raw materials and sub-components. In emerging countries in particular, the costs and constraints of the logistics environment often obviates any perceived cost savings.

Total Cost of Ownership

It is not by accident that the concept of total cost of ownership was born in the supply chain discipline. By the

Emerging Themes from the EPIC Assessment

Three predominant themes emerge from the EPIC assessment that relate to key supply chain decision areas covering demand markets, sourcing and manufacturing, and global trade and logistics.

1. Demand Market Trends. Despite the fact that other regions of the world are closing the gap in economic activity, strong consumer markets for finished goods remain in the US and Canada, the European Union (although at a lower level than pre-2009 levels), Japan, South Korea, and Taiwan, as well as in the large emerging markets of the BRIC nations (Brazil, Russia, India, and China). In these countries, product volumes, diversity, and short product life cycles are key for consumer goods managers, in particular for managers of Fast Moving Consumer Goods (FMCG). Other nations with rising consumer markets include Mexico, Turkey, Saudi Arabia, Colombia, South Africa, Indonesia, Malaysia, and Thailand. In all of these countries, the speed of development, changing volume requirements, and varying geographies and transportation infrastructure are the most challenging issues.

2. Sourcing and Manufacturing. Significant reengineering of supply chain networks is currently underway. The top emerging areas of opportunity for supply chain sourcing, manufacturing, and logistics to support regional and/or global consumer markets include Vietnam, Malaysia, India, Chile, Colombia, Uruguay, Brazil, Mexico, Costa Rica, Poland, Czech Republic, Slovakia, Nigeria, South Africa, Kenya, Germany, and the southern and western regions of the U.S. In addition, many opportunities are just beginning to emerge in Africa, largely supported by the infrastructure investment from China. Even in certain regions of Africa, where the manufacturing network may not meet requirements for worldwide distribution, there are factories capable of efficiently and effectively serving as a source of supply for products delivered within the region.

3. Global Trade and Logistics Hubs. The changes in market, sourcing, and manufacturing locations will predicate changing trade lanes among business nodes. Usual locations for establishing global trade and logistics hubs, as well as minor assembly, packaging, and/or redistribution facilities include Hong Kong, Singapore, Shanghai, and Rotterdam. In addition, similar opportunities are emerging in locations such as the UAE (specifically Dubai), Panama, Colombia, Saudi Arabia (thanks to the developing trans-Arabian highway), South Africa, Egypt (assuming political stability returns in the near future), Algeria, and Morocco. Even within regions, trade flows are shifting to highlight new areas of focus for assembly and logistics operations. In Europe, the center of gravity for trade flows is slowly shifting from a western oriented logistics network to one that is more centrally focused on the continent. In North America, flows are slowly shifting from an east-west or west-east axis to a more south-north access as Mexican ports and manufacturing centers gain in prevalence. The opening of the new Panama Canal in 2015 also promises to increase trade volumes in Gulf of Mexico and Southeastern U.S. ports, further strengthening that trend.

same token, supply chain has generated a renewed focus on considering the "economic profit" of sales, incorporating such cost and asset considerations as transportation, taxes and tariffs, exchange rates, risk issues, pipeline inventories, and responsiveness. Operating a successful supply chain in the global environment is not a simple phenomenon. Because the supply chain crosses all internal functions as well as the external supply and customer networks of an organization, supply chain managers are often better versed in the service, cost, and asset issues associated with strategic decisions compared to most of their functional colleagues in an organization. After all, managing the supply chain is their business.

Looking Ahead

The passage of time continues to attest to the dynamic nature of the modern world. Supply chain managers are compelled to be closely in touch with cultural, historical, and political trends that can change the playing field virtually overnight. For example, in 2011 the social movement that would eventually overtake the Arab world and lead several nations in the Middle East and North Africa towards violent revolution—a movement that continues today—was only in its infancy.

Technology breakthroughs may also change the global playing field. For example, the breakthroughs in drilling technology that sparked oil production booms in the U.S. and Canada, as well as offshore oil production near Africa and South America, will have significant implications for supply chain activity in the future. These breakthroughs have increased global oil output by nearly a third since 2008. In fact, less than 5 years ago, major supply chain educational conferences were featuring keynote sessions focused on the end of affordable oil. Looking forward, emerging technologies such as 3-D printing and intelligent robotics promise to revolutionize concepts in sourcing, manufacturing, and logistics, and throw current supply chain wisdom topsy-turvy. The increasing sophistication of Big Data applications promises another technological impact on global supply chain management, potentially changing global network designs based upon insights gleaned from massive amounts of operational data.

The changing dynamics of economics and politics could also abruptly shift the tectonic plates of global business, further impacting today's accepted view of global supply chain wisdom. Lower salary growth in developed economies compared to those in emerging economies combined with changes in energy prices could change the sourcing and manufacturing attractiveness of a region in a very short period of time. The trend toward re-shoring—select manufacturing making a return to the Unite States—is a good example of this. Given the economic turmoil in the southern tier of Europe, this trend could accelerate in Europe as well. Such trends could hasten the prediction of less global and more regional supply chain focus.

A foundational change in global demographics also is underway. By 2050, the population is projected to be close to 9 billion, with the most significant part (over 70 percent) living in large urban areas. At the same time, every industrialized nation is experiencing population aging, with some regions, particularly in East Asia, experiencing aging at alarming rates. Yet the emerging world is growing. In Africa, for example, the majority of the population is under 25 years old, and in Angola, 46 percent of the population is less than 15 years old. Future supply chains will need to focus on the needs of this growing, urbanized population. At the same time, these needs will be not the same from region to region. A new variable will enter the supply chain puzzle: differentiating form, time, and place value by population age; location; and level of urbanization.

Finally, the growing effect of sustainable development will affect supply chain decision making. For example, imagine the changes in consumer choice for products if the printing of CO2 footprint information on packaging became mandatory. If this criterion were to become more important than the price in certain regions, supply chains would have to adapt to find appropriate solutions, potentially altering the focus on short delivery time to instead optimize CO2 consumption. Consider how that would change the model being pursued by Amazon in the U.S., for example, which is currently driving online consumer purchasing in a number of categories toward same day delivery.

Such unpredictable changes could discourage even the most experienced and confident global supply chain manager. The changing situation opens a world of permanent re-engineering of the supply chain, with solutions rapidly changing over time and across regions. Thus, a final piece of advice to those managers: Buckle your seat belts and arm yourself with knowledge of the nuances among the nations and peoples of the world that affect supply chain decision making and operations.

This article is adapted from Mandyam Srinivasan, Theodore Stank, Philippe-Pierre Dornier, and Kenneth Petersen, *Global Supply Chains: Evaluating Regions on an EPIC Framework–Economy, Politics, Infrastructure, and Competence* (New York: McGraw-Hill Professional; 2014).

Research Methodology

For the purposes of this analysis, we divided the world into 10 geographic regions: East Asia, South Asia, Southeast Asia, Australia, Middle-East and North Africa, Sub-Saharan Africa, Western Europe, Central and East Europe, North and Central America, and South America. Each region is highlighted by a set of countries that are chosen based upon their population and GDP. A total of 55 nations were chosen from around the globe, representing over 90 percent of global GDP and over 80 percent of the population of the world.

The EPIC assessment of the key variables affecting supply chain management within the 55 nations identified by region enables the development of an overall grade for each of the four dimensions, Economy, Politics, Infrastructure, and Competence as follows. Table 1 identifies the variables associated with each of these dimensions. These variables are scored using data drawn from analyses provided by organizations such as the World Bank, the CIA World Factbook, The World Economic Forum (WEF), and the World Trade Organization, as shown in the table. The analyses provided by these organizations are based on comparative data gathered on countries in the world, typically resulting in a ranking of these countries on various measures. Such studies usually either cover all the countries, as is the case for the World Bank or the CIA World Factbook studies, or they cover countries that collectively represent more than 95 percent of the world's global domestic product (GDP) as is the case for the WEF data.

The EPIC assessment assigns scores for each variable to the countries simply by dividing the 55 countries ranked in the study into 12 equal segments. Thus, the top three segments represent the first quartile of all the countries covered by a study while the bottom three segments account for the fourth quartile of all the countries covered in the study. The three segments in the first quartile get grades of A, A- or B+, depending on where they are positioned in the first quartile. Countries in the second quartile get grades of B, B- and C+. Countries in the third quartile get grades of C, C- and D+. Countries in the bottom quartile get grades of D, D- and F.

Some variables in the EPIC structure do not lend themselves to a purely quantitative scoring approach. Such variables are, therefore, assessed using more qualitative approaches combined with insights from interviews conducted by the authors.

The scores for the different variables are combined to form an aggregate weighted average score for each dimension. The weighted scores for each dimension are combined to provide an overall EPIC grade for each country.

RESEARCH TABLE 1

Supply Chain Decision Uses for EPIC Variables

Dimension	Variable	Supply Chain Decisions Affected by the Variable
Economy	GDP and GDP Growth Rate	Retail store location Supply network – node location
	Population Size	Retail store location Sales channel –direct sales stores vs. distributors E-commerce vs. retail store
	Foreign Direct Investment	Manufacturing location
	Exchange Rate Stability & CPI	Manufacturing location
	Balance of Trade	Sourcing & Manufacturing location
Politics	Ease of Doing Business	Retail store location Supply network – node location Sourcing & Manufacturing location
	Legal & Regulatory Framework	Retail store location Supply network – node location Sourcing & Manufacturing location
	Risk of Political Stability	Retail store location Supply network – node location Sourcing & Manufacturing location
	Intellectual Property Rights	R&D center E-commerce vs. retail store Decisions on product design
Infrastructure	Transportation Infrastructure	Logistics network design
	Utility Infrastructure (Electricity)	Sourcing, manufacturing, and logistics location
	Telecommunication & Connectivity	Sourcing, manufacturing, and logistics location Retail store location
Competence	Labor Relations	Sourcing, manufacturing, and logistics location
	Education Level	R&D center E-commerce vs. retail store Design school and champion Sourcing, manufacturing and logistics location Retail store location
	Logistics Competence*	Sourcing, manufacturing, and logistics location E-commerce vs. retail store (e.g. courier services)
	Customs & Security*	Sourcing, manufacturing, and logistics location

Source: By Theodore (Ted) Stank, Philippe-Pierre Dornier, Kenneth J. Petersen, and Mandyam M. Srinivasan

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Strategic Growth: Global Trade Com Tool for Success

By Jennifer Wade

Global sales opportunity—or supply chain snafu? Too often, the two go together when an organization embarking on global expansion discovers that its shipment is out of compliance with a trade regulation that had not been considered in advance.

When this happens, the story is almost always the same: "An overseas opportunity came up and we made a deal. But we ignored the fact that we had to cross an international border, and now our goods are hung up at Customs, we're paying warehouse fees that we didn't plan on, and we've just learned that someone has to go down and mark the goods."

Even today, in what's clearly a worldwide economy, that's how many companies embark on doing business globally. They probably have the "bones" of a global supply chain firmly in place, but they may lack the trade compliance programs that can make or break their cross-border supply chain activities. At best, they get themselves into all kinds of trade compliance hassles; at worst, they see those hassles as a sign that any further expansion into foreign markets is not worth it.

It doesn't have to be that way. To the contrary, for most of those companies, backing away from overseas engagements would be a much bigger mistake—a potential strategic mistake. The fact is that for companies that can appropriately and consistently manage the ins and outs of trade compliance across a supply chain, there are substantial opportunities for global growth. Instead of viewing global trade processes as "necessary evils," or even as barriers to business, companies should view them as crucial levers that can help create a competitive advantage. Reframing the situation in that light, a trade-compliant supply chain can enable a business to get more goods into new markets faster and cheaper than the competition. Better yet, it can open up fresh revenue opportunities that competitors cannot access when they lack the internal infrastructure to support business that might require a government license or authorization.

It's much easier to see and communicate the value of a trade-compliant supply chain when there are metrics to demonstrate the volume of business that can be enabled with a strong risk management infrastructure and use of compliance opportunities, such as licenses. For example, one company with robust metrics was able to pinpoint about $125 million in revenue related to authorized sales to two countries that had been subject to international sanctions.

Trade compliance is nothing new, of course, but it is playing an increasingly influential role in the effectiveness of global supply chains. The negatives are obvious: When managed poorly,

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pliance as a

Compliance with global trade regulations is rapidly becoming much more than an exercise in risk management. Increasingly, it is a strategic capability that can help companies increase their competitive advantages and grow revenues. That's especially so as governments worldwide crack down on non-compliance. Here is a glimpse of the upside of effective global trade compliance, and a way to rethink how supply chain leaders must engage with their companies' compliance experts.

global trade compliance can be not only a cost burden but a major liability. That is especially so as more and more regulatory agencies worldwide pursue more active enforcement—and as they levy ever higher penalties for non-compliance. Crack-downs are coming harder and faster: Increasingly, nations are favoring enforcement over customs duties as a means of generating revenue.

The positives are not so immediately apparent, but they become increasingly attractive as compliance requirements ratchet up. With sufficient awareness and planning, an effective global trade compliance team can often secure authorizations that can "make" a sale, or transact business that others without the requisite authorizations will certainly miss out on. Additionally, they may be able to take advantage of tariff and fee reductions in areas where regional trade agreements are in place to encourage trade. Part of doing all of this right is not just supporting the compliance team and enabling them with the appropriate resources, but also embedding them in the supply chain effectively.

Instead of viewing global trade processes as "necessary evils" or even as barriers to business, companies should view them as crucial levers that can help create competitive advantage.

This article will focus on the critical and strategic role global trade compliance can play in new market expansion when it is developed as a competitive advantage empowered to support a company's international footprint and growth strategy. Specifically, we'll look at the positives—the opportunities opened up by a more robust approach to compliance—and acknowledge the drawback of failing to adopt that approach. We will also examine the roles and responsibilities of those on a compliance team, looking in particular at where the team's job intersects with primary supply chain activities.

Getting Ready for the Opportunities

There is no shortage of opportunity in markets where trade licenses or authorizations are commonly required. That's true even during times that are less economically robust. The BRICS countries (Brazil, Russia, India, China, and South Africa), in particular, imported 83 percent more in 2013 than they did just four years earlier. In the same period, developing markets saw the value of their imports increase by 74 percent. (See footnote[1] at the end of this article for a complete list of developing market countries.) The year-to-year growth in both sectors did slow significantly in 2012 and 2013 as the global economic downturn hit, but many believe fast growth will return. Now is the time to build up your company's compliance infrastructure and supply chain capabilities so it will be properly positioned to take advantage of fast go-to-market strategies when import demand recovers.

An essential part of that effort involves having the right expertise on hand. To minimize the risks and maximize opportunities to deliver value, forward-looking supply chain executives include global trade compliance professionals when making strategic decisions about sourcing, supply chain design, or even about business partner selection. We'll come back to the topic of who should be on the team later in this article.

Specialized insights are crucial because trade factors are nuanced and constantly in flux. Regardless of how good your documentation and processes may be, you still have to contend with basic country infrastructure and capabilities. For example, countries have average import lead times that must be factored in—and which can change. (Customs clearance is obviously a critical aspect of this metric.) The World Bank publishes statistics, based on World Development Indicators, showing some improvements in those measures. Brazil's average import times dropped from 3.9 days in 2010 to 2.0 days in 2012, while India's imports moved through in 3.0 days in 2012 compared to 5.3 days just two years earlier. By contrast, import times are stretching out elsewhere: In that 2010-2012 period, China imports went from 2.6 days to 4.0 days and Russia's lengthened from 2.9 days to 3.0 days.

Many countries put significant emphasis and focus on certain trade data as part of the import process. This shift in focus over the years from focus on data elements such as value (because the direct benefit to the country was an increase in revenues from tariffs) to a focus on enforcement of accuracy of data elements which can be seen across shipping and trade documents, such as description or classification, further reflects the perspective of emphasis on enforcement and opportunities for revenue generation through penalties, rather than an emphasis on tariffs and value. One example of such trade data that must be proactively managed: the accuracy of weights listed

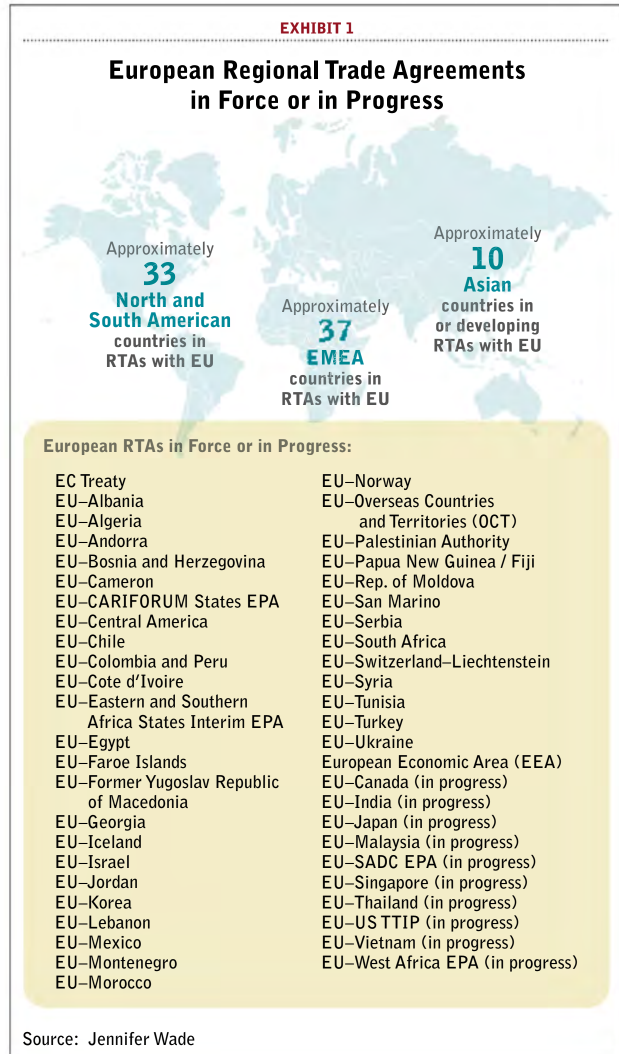
on the shipping documentation. This can be especially challenging when pro-forma invoices must be prepared prior to importation. If we look at Brazil as an example, many imports require an import permit; in such cases, a pro-forma invoice must be presented in order to obtain the permit. If information changes between the pro-forma invoice and the invoice used for actual importation, a letter of correction must accompany the import documentation.

It's also important to point out that in many countries, the tariff rate may be based on weight of the item instead of piece count. Therefore, not only are you looking at a compliance risk that can impact your total transit time and potentially your landed cost, but there are duty implications if weight is not properly assessed and documented. Although a focus on the weight of an item or shipment can be practical from a supply chain security standpoint — helping to expose pilferage or smuggling during transit, for instance —it can also be an operational burden if there are many touch-points and hand-offs among supply chain partners between origin and delivery. Knowing about such requirements and establishing compliant entry processes early on can save you plenty of pain and cost in the long run.

Detailed, up-to-date knowledge of free trade agreements (FTAs) or other duty reduction programs can also help maximize profits when companies are expanding into new markets. Significant savings may be possible if the items being sold into the new market are sourced from various locations, and those locations qualify for reduced or duty-free status under an FTA.

Interestingly, duty reduction programs are proliferating. (See Exhibit 1.) The World Trade Organization reports that there are currently 379 regional trade agreements (RTAs) in force out of a total 585 agreements about which the WTO has been notified. RTAs and customs unions have been expanding at a rapid clip since the 1980s: From the 1990s to the 2000s, there was a 120 percent year-to-year increase in the numbers of agreements entered into force. And over the last four years, 20 percent more agreements have been signed than between 2000 and 2004. Of the RTAs currently under negotiation, more than 90 percent are FTAs and the rest are customs unions. (Customs unions are agreements in which countries pool certain trade-process resources such as an import tariff code or classification. Companies can benefit from such unions because they may be able to extend a favorable classification ruling in one country to other nations, for instance.)

Governments see the value of these duty-reduction



agreements on the country-wide or regional scale. The United States (US) alone has FTAs in effect with 20 countries. The European Union (EU) has more than 30 current bilateral or regional agreements in place; if it were to complete all current free-trade talks in progress, the EU estimates it could add €275 billion, or 2.2 percent, to its gross domestic product. For businesses, the upside is equally attractive: Sourcing items from a nation that is party to an RTA could result in a zero percent duty rate, for example.

At the same time, companies can get a leg up on their competitors by participating in voluntary public-private partnership programs such as the Trusted Trader program in the US or the Authorized Economic Operator (AEO) programs in some Asian and European countries. These kinds of voluntary programs typically require a company to conduct its own risk management, share those practices and the results of the risk management activity with the government, and possibly even provide

early access to shipment information, in exchange for special treatment during customs clearance. For example, a company may choose to set up a cross-functional trade council to oversee annual assessments of compliance, commit to resolving issues identified in the assessment, and share those results with a customs agency if requested or required. In return, the government agencies provide early access in the form of reduced inspections and holds for standard transactions, or they promise "front of the line" access should a natural disaster, strike, or other activity temporarily shut down a port of entry.

Such partnership programs are expanding. The WTO's SAFE Framework of Standards to Secure and Facilitate Global Trade (SAFE Framework) and the growing trend of mutual recognition agreements indicate that more and more emerging markets may start using these programs to make the most of their scarce border resources, so they can focus on revenue collection or non-compliance, or both. The SAFE Framework is based largely on AEO programs and on the US Customs-Trade Partnership Against Terrorism initiative. Companies that may be considering investing in such programs can anticipate future benefits across multiple markets – not just in a handful of countries. As of 2014, there were already some 53 operational AEO programs worldwide, and 10 more being launched. Additionally, there are 23 Mutual Recognition Agreements in place, and 12 under negotiation. This means that efforts put toward joining one country's AEO program are increasingly likely to pay off in other countries in the future.

Acknowledging the Consequences of Poor Compliance

Given the complexity of and constant change in global trade conditions, it is critical for companies to invest in building the controls necessary to ensure that business is conducted within the pertinent regulations and laws. In the past, when companies weighed their risk tolerance, it might have been easy for some to say: "100 percent compliance is not achievable, and the chances of getting caught are so slim. I'm just going to roll the dice and I'm sure we'll be fine." But in today's environment of increased scrutiny and enforcement, this strategy is more careless than calculated — especially because the penalties for flouting trade regulations are reaching levels never seen before.

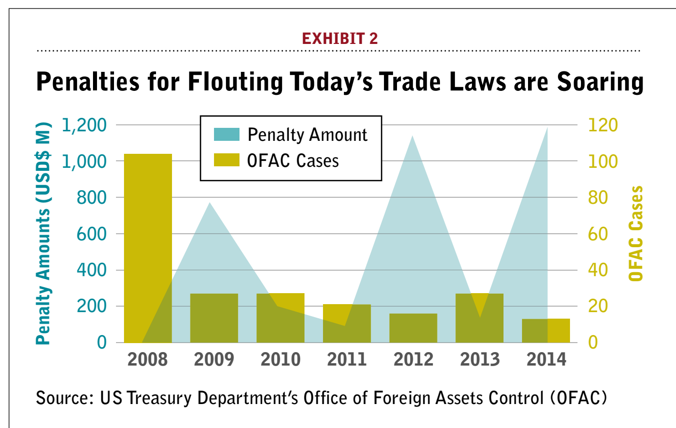
One need look only at the pattern of enforcement carried out by the US Treasury Department's Office of Foreign Assets Control (OFAC) to see the scale of the challenge: Total annual penalties have gone from $3.5 million over a total of 104 cases in 2003 to nearly $1.2 billion spanning just 13 cases to date in 2014. (See Exhibit 2.) Yes, each OFAC case is unique in terms of the number and severity of its compliance failures and the associated penalties. But supply chain leaders must not overlook the fact that the US government appears to be spending its limited resources on pursuing big cases that have significant penalty implications rather than a large number of smaller cases. Significant attention is also being paid to companies large and small that are doing business with either embargoed or sanctioned countries, or companies doing business with persons and entities on the restricted party lists.

Ignorance of the law is no defense. Lack of knowledge is still punishable in many cases. So this is a good time to become familiar with the "strict liability" criteria and to assess the severity of the fines and penalties levied for non-compliance with certain trade regulations and laws. In the US, where regulations and laws can have extra-territorial reach and apply to persons and entities outside of the US (if US jurisdiction applies), fines and penalties for violations of import and export regulations and laws can range from $10,000 up to $1 million per violation, in addition to potential personal liability, including jail time, or loss of the company's export or import privileges. The trend of increasing penalties is on the rise in other countries, too, with fines soaring up to five times the value of the imports in some cases.

Making things worse: significant growth in the numbers of simultaneous audits undergone by multinationals. For example, a company may be under a valuation audit in Germany and Mexico, and at the same time undergoing import audits in China and a supply chain security assessment in the US and Singapore. This trend is because governments are getting better at leveraging data to identify potential areas of non-

EXHIBIT 2

Penalties for Flouting Today's Trade Laws are Soaring



Source: US Treasury Department's Office of Foreign Assets Control (OFAC)

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compliance, and at sharing information among each other. Governments are benefiting from technology too: They are finding ways to more efficiently utilize their resources, streamlining their ability to conduct audits and utilize their new penalty structures.

Companies with strong compliance infrastructures can more easily and quickly respond to these increased levels of government inquiry. Those that have automated their order management and trade compliance activities can, within just a couple of hours, give their supply chain teams the visibility and access to data they need to respond to a government inquiry into something as fundamental as import volumes and shipment values.

Assembling the Right Team

As noted earlier, it is essential for supply chain executives to leverage the expertise of those who specialize in global trade matters. Just as the supply chain organization partners with the marketing department to better understand anticipated future sales and market growth plans and with product development teams to plan for new product introductions, so it must invite the company's global trade compliance professionals to the table to ensure that classifications are completed in a timely fashion, that licenses and other government authorizations are in place within the required time frames, and that all opportunities for minimizing risk and supporting reliability are identified and leveraged.

In larger companies in particular, it is common for there to be a "trade policy" group within the finance or legal functions. This group typically focuses on managing and assessing the company's trade compliance risk by establishing corporate policies and procedures, and potentially partnering with corporate audit, or conducting assessments independently to ensure compliance with internal policies and the law.

It is also common for there to be an operationally focused team, often within the supply chain function, that has country or regional-level responsibility for executing import or export activities, or for managing the business partners that conduct such activities on the company's behalf. But it is not typical for those trade specialists to be woven into the fabric of ongoing supply chain operations; particularly when it comes to supply chain design and strategic decision-making.

In some companies, the global trade person or team may actually be a brake on an effective global supply chain. That's the case when the person or team tends to say "no" to more complex compliance challenges because they have no tolerance for risk, or because the company lacks the controls it needs to bring risks within acceptable levels. In many smaller companies, the situation may be even more precarious: There may be no global trade compliance point person or team at all.

Regardless of the organizational structure, the inclusion of the global trade compliance team in supply chain activities opens up new strategic opportunities. While supply chain managers may have direct access to information on landed costs, say, the global trade compliance team can further advise on any tariff or non-tariff barriers which may not be calculated as directly as freight rates, but which could have significant impact on the overall cost of delivery, or even on the company's ability to meet customer delivery commitments.

The company noted earlier—which had identified more than $125 million in annual revenues in traditionally restricted markets requiring general and specific licenses—provides a good example of how to rethink the role of global trade compliance experts. The company already had a trade compliance program in place at the operational level, within the supply chain. However, while implementing an improved corporate-level program within its legal department, its managers spotted further opportunity if they were to expand the license management program.

Crack-downs are coming harder and faster: increasingly, nations are favoring enforcement over Customs duties as a means of generating revenue.

As a result, the company hired a professional whom it dedicated to managing US export licenses. This person manages authorization applications, handles training for and management of compliance with license conditions, does a random sampling of transactions under obtained licenses to manage risk, and is proactive with all license renewals to ensure that the supply chain operates with as little trade friction as possible. The company's investment in one expert hire pales into insignificance next to the additional $125 million it has won.

Having a knowledgeable trade compliance team on board is excellent insurance against increasingly prevalent trade penalties. In the OFAC and other cases published, penalties are regularly mitigated when the authorities acknowledge that a trade compliance program was in place, risks were identified and disclosed, and the company took appropriate action to identify

and correct the root cause of the problem. On the flip side, OFAC and similar agencies take a dim view of well-established multinational corporations that, in their view, lack the compliance infrastructure appropriate to their size and sophistication, and they penalize those corporations accordingly.

Many companies—particularly small and mid-sized organizations—may think it is formidably difficult to attract properly credentialed trade experts. Yes, years ago, it may have been tough to find an experienced trade professional who could think about compliance strategically and effectively. But much is changing. Professional organizations such as the Society for International Affairs, the American Association of Importers and Exporters, the International Compliance Professionals Associations, and others are seeing their numbers of experienced, well-trained members growing; some organizations estimate growth at between 15 percent and 20 percent a year.

So what kinds of credentials are necessary? Although it is absolutely acceptable to bring someone into a trade compliance program who has not dealt with importing or exporting in many years, or who perhaps is looking to make a career shift into trade compliance, it would be a mistake to rely on this person as the sole driver of the company's trade compliance program. Indeed, regardless of how skilled a compliance professional may be, it is a huge liability to have just one person responsible for the function. There have been numerous references to this liability not only in relation to stated fines and penalties but in the best-practice recommendations from both government and professional organizations.

The necessary skills for trade compliance today involve business and financial acumen for sure, along with strong written and verbal communication skills. At the same time, strategy, leadership, and program management capabilities are just as important as detailed knowledge of the regulations, a legal degree, or a license or certification. With detailed and always up-to-date knowledge of trade regulations as a fundamental capability, today's global trade compliance executive must be exceptionally adept at business leadership—especially at influencing others to drive the change and execute on the compliance-based supply chain strategy required to be successful. A strong trade compliance team should be led and staffed by people who understand and can persuasively, powerfully communicate their group's direct impact to the company's objectives and bottom line.

Market expansion is obviously not a simple endeavor. But it's not a zero sum game either. When global trade compliance is managed well, everybody can benefit from the increase in economic activity. In this article we have argued that companies that master the fine points of global trade compliance—and properly harness the necessary expertise—can establish significant competitive differentiation. The message is clear: Invest in, support, and utilize your global trade compliance program in strategic ways and your competitors will struggle to keep up.

1 Developing Market Economies, as grouped by the International Trade Centre, and based on the UN COMTRADE statistics, include China, Hong Kong, Korea, India Mexico, Singapore, Russia, Turkey, Thailand, Brazil, United Arab Emirates, Malaysia, Indonesia, Vietnam, Saudi Arabia, South Africa, Chile, Ukraine, Argentina, Israel, Egypt, Philippines, Panama, Colombia, Algeria, Kazakhstan, Nigeria, Venezuela, Morocco, Iran, Pakistan, Belarus, Iraq, Peru, Oman, Bangladesh, Qatar, Ecuador, Tunisia, Libya, Kuwait, Angola, Jordan, Lebanon, Croatia, Serbia, Dominican Republic, Myanmar, Costa Rica, Guatemala, Sri Lanka, Kenya, Azerbaijan, Ghana, Marshall Islands, Liberia, Tanzania, Uzbekistan, Paraguay, Cambodia, Uruguay, El Salvador, Yemen, Bosnia and Herzegovina, Zambia, Mozambique, Bahamas, Kyrgystan, Honduras, Congo, Bahrain, Georgia, Turkmenistan, Sudan, Zimbabwe, Namibia, Botswana, Bolivia, Cuba, Trinidad and Tobago, Macedonia, Afghanistan, Ethiopia, Mongolia, Cote D'Ivoire, Lao, Senegal, Papua New Guinea, Nepal, Syria, Cameroon, Uganda, Moldova, Mauritius, Democratic Republic of Congo, Nicaragua, Albania, Armenia, Jamaica, Tajikistan, Benin, Brunei, Netherland Antilles, Gabon, Guinea, Mauritania, Haiti, Madagascar, New Caledonia, Aruba, Equatorial Guinea, Malawi, Djibouti, British Virgin Islands, Fiji, Montenegro, Cayman Islands, Mali, Togo, Burkina Faso, French Polynesia, Barbados, Maldives, Guyana, Niger, Swaziland, Suriname, Rwanda, Lesotho, Sierra Leone, Chad, Bermuda, US Minor Outlying Islands, Somalia, Saint Lucia, Gambia, Belize, Vanuatu, Greenland, Seychelles, Burundi, Cabo Verde, Palestine, Mayotte, Timor-Leste, Saint Vincent and the Grenadines, Eritrea, Solomon Islands, Saint Kitts and Nevis, Samoa, Antigua and Barbuda, Guinea-Bissau, Turks and Caicos Islands, Bhutan, Dominica, Comoros, Grenada, Cook Islands, Sao Tome and Principe, Nauru, Malvinas, Tonga, Central African Republic, Kiribati, Anguilla, Micronesia, Tuvalu, Palau, Saint Helena, British Indian Ocean Territories, St. Pierre and Miquelon, French South Antarctic Territories, American Samoa, Christmas Islands, Northern Mariana Islands, Montserrat, Wallis and Futuna Islands, Cocos Islands, Norfolk Island, Tokelau, Niue, Pitcairn, Western Sahara, and Guam.

Contracting in China: A Contract Worth the

Supply chain contracts in emerging markets like China were once not worth the paper they were written on. As the market and legal systems mature, savvy organizations are using supply contracts to protect the integrity of their global supply chains.

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By Chris Carr and Dan Harris

Supply chain professionals rarely view issues such as counterfeiting, intellectual property, and contracting as supply chain issues. But in today's economic environment, these can play a crucial role in protecting the integrity and security of global supply chains. This article focuses on one of those issues: the important role of supply chain contracting, using China sourcing as the example.

Over the years, numerous U.S. buyers have been content to purchase from Chinese suppliers without a written contract and with no long-term commitment from either party. We also know of companies that have purchased product from the same supplier for years on a per-purchase-order basis.

This approach is changing, as more and more buyers begin to understand the benefits of establishing long-term, written purchase contracts with their suppliers. There are several reasons why these buyers are beginning to use contracts for their China product purchases.

Major retailers have diverse sources of product and all of their product must meet a basic standard to fit smoothly into their operations. Product delivered late or that does not meet specifications fouls up the supply chain. Product that is subject to an intellectual property infringement challenge or contains pirated, non-standard parts or components that raise safety issues also disrupt the supply chain.

In the early days of buying product from China, the price was so cheap that U.S. buyers were willing to absorb the costs of non-compliance issues. But with rising prices in China and tight supply chain management, these disruptions and cost overruns can no longer be easily tolerated by retailers that are already under financial stress. Many buyers now have no choice but to impose by contract the same standards on their Chinese suppliers that they are expected to provide to major retailer customers.

Paper it's Written On

The reason for these written agreements is simple. They are being used to make sure that the Chinese manufacturer understands exactly what is required of it and to make sure that the Chinese company knows it will face legal repercussions if it fails to abide by those requirements. In other words, the smart buyer is now saying: "I will no longer absorb the costs caused by your lack of compliance with the conditions of sale. If you don't perform, I will suffer a loss and I am going to pass that loss on to you."

This contract trend is just part of an inexorable overall maturation we are seeing in China's manufacturing system. Smart buyers are getting standardization and accountability through good contracts or moving on to another factory. Chinese manufacturers that get the message and comply with detailed purchasing and manufacturing agreements will survive; those that do not won't. It is that simple.

We have discussed these shifts with Chinese factory owners and none have disagreed. Note, however, that this Darwinian evolution in the product world applies with equal force to foreign buyers. Buyers that continue absorbing the cost of Chinese manufacturer non-compliance will be swept away. We are already aware of a number of U.S. product buyers who have gone under after getting badly burned by a per-purchase-order product buy.

The Legal Landscape for Resolving Business Disputes in China is Maturing

Now that we have your attention, we come to the part of the discussion where we usually hear a Western manager say: "Fine, the ground is shifting in China, but so what? Everybody knows that corruption remains rampant and contracts in China are not worth the paper they are printed on, so why bother?"

While there may have been some truth to that argument in the past, it misses the mark today. Litigation rates in business and commercial disputes in China are rising. This is important because rational business people only decide to file a lawsuit after having determined that the benefits of suing outweigh the costs of pursuing other options to resolve the dispute. Thus, the continuous rise in litigation rates in China shows that the Chinese court system is delivering more of the benefits desired by business litigants than not. Further, World Bank data on enforcement of judgments in China commercial disputes will surprise people. As of 2013, China ranked 19/185 in this category, up from 37/185 in 2007. Finally, Chinese appellate court data, as evidenced by the gradual decline in the percentage of trial judgments revised or reversed on appeal, suggests that the quality of judgments and justice rendered by Chinese courts of first instance in commercial disputes has improved over the years.

So the question becomes: What are the attributes of a winning China supply chain contract? Based on our experience, a winning contract addresses the following:

Have a written contract, and write it in Chinese. A good contract is more than a series of e-mails, a purchase order, oral understandings or conversations, memorandum of understanding (MOU), or guanxi (a business relationship). This statement seems obvious, but we can't tell you how many clients we see fail at this initial step. Further, the overwhelming majority of the contracts we draft for our Western clients doing business in China are in Chinese. We draft the contract in English first so that the client can review it. Once our client approves the English language version, one of our lawyers fluent in Mandarin translates it into Mandarin. To give you a look under the hood of the legal industry, we believe one reason so many U.S. law firms do not write their agreements in Chinese is because they do not have lawyers who can read and write Mandarin fluently.

If the contract is in well written and clear Chinese your Chinese supplier is more likely to read, understand, and actually comply with it, and a Chinese court will be more likely to understand and enforce it.

We also favor using clear, simple, normal language for our contracts, as opposed to the usual legalese. Why is this important? If the contract is in well written and clear Chinese your Chinese supplier is more likely to read, understand, and actually comply with it, and a Chinese court will be more likely to understand and enforce it.

Identify how disputes are to be resolved and pick the right forum and law to be applied. We often recommend that foreign firms agree to a written contract specifying that a lawsuit in a court in China (usually) or an in-China arbitration (sometimes) be the sole and exclusive forum to hear and decide the case, and with Chinese law to apply. This advice often rattles the sensibilities of Western managers. Why would a rational litigant waive its home field advantage? There are a number of reasons.

For starts, there is usually no alternative. Consider a U.S. company that has a contract with a Chinese manufacturer that has no assets outside China. The Chinese manufacturer delivers a defective product and the U.S. company suffers substantial lost profits as a result. The contract states that in the event of a dispute they "shall" litigate in the courts of California under California law.

The U.S. company and its lawyer, both based in the Los Angeles area, are feeling good for having out-negotiated the Chinese side by convincing it to accept a dispute resolution clause with such onerous terms. Part of the thinking behind inserting this dispute resolution clause into the contract was that it would also force the Chinese side to file a lawsuit outside of China that subjects it to foreign law and procedure. However, this is a mirage. How many times will a Chinese manufacturer file a lawsuit against the U.S. firm, especially because most China manufacturing contracts require all or most of the cost be paid up front? Virtually always it is the U.S. firm that wants to file a lawsuit, not the Chinese seller of products.

Now here is where the problem of suing in the United States arises. If the U.S. firm sues in a state or

federal court in California and wins, its judgment will be worthless because Chinese courts will not enforce it.

But wait, you say. The U.S. company was thinking ahead when it provided in the contract for arbitration (not litigation) in the U.S., because China is a signatory to the New York Convention on the enforcement of arbitral awards. China will therefore enforce a private arbitration award coming out of California in favor of the U.S. company. Right? Not necessarily. In fact, statistics that show China has a good record at enforcing foreign arbitration awards are misleading. Though they show a low incidence of cases in which Chinese courts have explicitly ruled not to enforce an award, they fail to account for the number of times Chinese courts have simply stalled for years the enforcement of the foreign arbitration award.

We have on many occasions had to tell American companies with U.S. judgments that all the time and money they spent obtaining such a judgment was for naught. At that point, they often suggest that we "start all over and just sue the Chinese company in China," as though the U.S. litigation never happened. That, however, is not a realistic option.

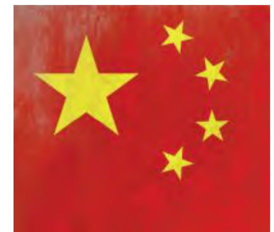
At the start of litigation in China, the court will first look at the dispute resolution provision of the contract, and if the contract provides for dispute resolution outside China the court will usually refuse to hear the case. Not only that, the American company has already sued and won in the United States so the Chinese court would also be likely to dismiss the case on what is called res judicata grounds as well—a doctrine that a matter may not be re-litigated once it has already been judged.

And trust us when we tell you that Chinese lawyers, and by extension their Chinese clients, know exactly what they are doing when they "play tough" by acting as though they do not want disputes resolved in U.S. courts. Once a contract has been signed that calls for U.S. litigation, Chinese companies with all of their assets in China (this is most Chinese companies) know that they can breach the contract with impunity.

How can U.S. companies avoid the above minefield and headache in the first place? Simple: Draft the contract in Chinese and have it specify that any dispute be resolved by lawsuit in the appropriate Chinese court (usually) or through an in-China arbitration proceeding (sometimes), and with Chinese law to apply. With respect to selecting whether to litigate or arbitrate in China, note that if you put the appropriate damages provision into your contract, the Chinese courts likely will allow you to seize your Chinese manufacturer's assets (up to the amount of the contract damages) almost immediately after you file your lawsuit. Arbitration in China generally does not allow for this. There are several other hallmarks of a good China supply chain contract:

Lay out, in great detail, what the Chinese supplier must do to comply with the contract. If your written contract does not clearly specify it, your Chinese supplier will almost certainly not supply it and a Chinese court will not require it. Period. If you are buying red umbrellas, your contract must say more than "my standard is a red umbrella." It should state the Pantone Color Guide # of red required and the exact size and material of every part of your umbrella and it should be clear on the damages your Chinese manufacturer must pay you if it fails to comply. Putting something like "good quality" in a contract with a Chinese manufacturer is a non-starter. The term "good quality" in China has virtually no legal meaning and even if it did, what constitutes good quality there is very different from what constitutes good quality here. Standard terms that typically should be clearly addressed in a Chinese manufacturing contract include price, quantity, Incoterms/terms of trade, payment terms, warranty terms, tooling use and ownership details, contract damages for missed delivery dates, contract damages for defective product or late delivery, the buyer's end product and in product-raw material quality control standards and expectations, IP protection details, non-disclosure/non-compete/non-circumvention details, CSR details, choice of law and forum, and indemnification.

> **If your written contract does not clearly specify it,** your Chinese supplier will almost certainly not supply it and a Chinese court will not require it. Period.



Use a contract damages clause. One of the hallmarks of a good China supply chain contract is that it

provides for specific contract damages if the Chinese side fails to abide by its crucial terms. Chinese courts tend to enforce damages provisions as long as they are not unreasonable.

Have the Chinese seal ("chop") the contract. Each Chinese company has only one "legal representative," which is a term of art under Chinese law. That person is identified as such on the company's business license. Any agreement signed by a company's legal representative is binding, but if it is signed by someone other than the legal representative it may not be binding unless it is appropriately sealed ("chopped"). Agreements affixed with the company chop are binding, regardless of who signed the agreement. Each Chinese company has only one seal or chop (no copies) for the signing of contracts and Chinese companies typically store it under lock and key, accessible to only a few trusted people within the company. If your contract has been appropriately chopped, it will be nearly impossible for the Chinese company to claim that its contract with you was done without company authority.

Final Thoughts and Recommendations

The above analysis assumes you have done your due diligence. If not, and you pick the wrong supplier, you will likely be burned (See sidebar for more information on how to conduct due diligence on a Chinese supplier). But this is a very different issue than whether contracts in China are worth the paper on which they are written. Also, in the prep work leading up to the formal signing of the contract with your Chinese supplier, be aware of

China Sourcing Due Diligence

There is no contract, attorney, judge, or legal system in the world that can make you whole if you pick the wrong person or firm to do business with. If you select a supplier that can't produce the products or quality you want, or if they are a scam business or on the verge of bankruptcy, the supply chain story will not end well for you. Below we discuss several due diligence items to consider when evaluating potential Chinese sourcing partners. This is not a complete list, but a starting point.

Obtain and Study the Business License. First, ask the Chinese company to send you a copy of its business license. This is something Chinese companies are asked to do frequently. If the Chinese company refuses, walk away. Once you receive it, you then need to have someone fluent in Chinese—and Chinese business licenses—examine it to determine whether it is real or fake. For example, compare the information on the business license provided to you with the corresponding information on the relevant Chinese government Website—typically the local State Administration for Industry and Commerce (SAIC). If the business license you have been provided is fake, you obviously walk away.

Look to see when the company was formed. We like to compare what the real business license says against what we were told, by e-mail or other, and also what the Chinese company says on its English language and Chinese language Websites. If there are different years given in different places, we get suspicious and ask more questions. We also pay attention to where the company is located, and compare this against what we were told and what the Chinese company says on both its English language and its Chinese language Website. Again, if different addresses are given in different places, we get suspicious and we ask more questions.

Further, study the scope of the Chinese business, as listed on its license and registration documents. If the scope is "consulting" and our client thinks it will be ordering 10 million dollars worth of widgets from a factory, we get really suspicious. Looking at the scope is a good, though not always a fool-proof, way to determine whether you are dealing with a manufacturer or a middleman-broker. Also try to verify the amount of registered capital. If the amount is too low, the odds are good that it is not a manufacturer. If the amount is really high, the odds are good that this is a big company.

Trust but verify. Just because your Chinese partner or its lawyer tells you this is how it's done in China, that doesn't mean it's true or that you should abandon your moral compass or common sense. Don't rely just on your gut. Everything you do with a company in China, or in any foreign country for that matter, should be proven and verified with your own eyes and ears or those of a reliable third party.

Hire a legitimate quality assurance/inspection firm and business/competitive intelligence firm. These folks are much better at this than you will ever be or have time to be, so just hire them and be done with it. A quality assurance/inspection firm can be invaluable to confirm that the target Chinese firm can make and deliver the product it promised you, in a timely and quality manner. Based on current rates and scope of work, this will cost you in the range of $300 to $500 USD per day for a one-day factory visit by a quality inspector and

some of the nuances of China's civil law based legal system and how it differs from the West.

For example, if you are going to litigate in China, either as a plaintiff or defendant, you should gather up your evidence and have it ready to go before you even file the case. This is because once a business case begins in a Chinese court, things move fast. Within a month or so after the case is filed the court normally issues a notice to produce evidence, sometimes in as little as 14 days. This means you will need to provide the opposing side and court with enough evidence, in Chinese, to win the case. Chinese courts strongly favor documentary evidence over live testimony. So have your documents ready to go at the outset, and realize that the Western manager you were planning to use to prove an important part of your case may not even be allowed to testify. This is not all bad: It is one reason business cases in China are often resolved in six months to a year.

China and its legal system have come a long way in enforcing business contracts, including supply chain contracts. Because of this, there is significant value in negotiating and preparing a well-thought-out contract with your Chinese supplier. Doing so helps you protect the security and integrity of your goods and your global supply chain.

Note: A portion of this article is adapted from an article to be published in the *Thunderbird International Business Review*, by Wiley Periodicals, Inc. (Carr, C. & Harris, D., Strategic Contracting in China for Foreign Firms, forthcoming 2015).

$3,000 to $5,000 USD for a business intelligence firm to determine if the Chinese company is a viable, sound, healthy, and sustainable business. If you can't afford this basic due diligence up front you either are not ready for China or you will need to find a way to do these steps yourself.

View the target supplier as a local. Try to discover what the China customers of the target supplier see and think. It's harder for a Chinese company to defraud one of their own than to defraud a foreigner. This is because the local companies and customers demand to look under the supplier's sourcing hood. You should do the same.

Avoid middlemen. Middlemen still seem to be everywhere in China. There are historical, cultural, and economic reasons for this. A middleman can be good or bad, but in our experience, they are usually bad. On the surface, they claim guanxi with the government or an intimate relationship with the target Chinese supplier, but if they don't allow you to communicate directly with the official or supplier, then you are dealing with a middleman and their value to you is minimal. In most instances, it makes more sense to build your own networks in China to help you understand the government, company, or industry.

Be cynical. Early in the relationship think about how you would make or build everything you've seen, been shown, heard, or done with the company. Ask yourself how the driver knew to take you to "this" factory. Could the equipment or raw materials you saw in the warehouse have been moved there just to fool you? How could the manufacturing steps you are seeing be skipped? How could the product you are seeing be mislabeled? Are the "workers" you see really company employees or people paid a small amount to show up just that day? Again, a good quality assurance or competitive intelligence firm can help you here.

Put the paper you receive from the supplier under a microscope. Color printers today cost less than $200. 3-D printers are now prevalent. It's therefore hard to understand why people today still play by the U.S. audit playbook and place so much faith in bank statements, invoices, and contracts. Forgery is a real problem in China, so don't take the documents you see at face value. If you put the documents you receive under a microscope you can find that a fraudulent company nearly always makes some mistake in the document that throws up a red flag. Some examples we've seen:

- Company claimed to have a multi-million dollar account at a non-existent bank.
- Company documents showed a subsidiary in the Marshall Islands, yet always spelled the country as 'Marshal Island'. It had no such subsidiary.
- Company claimed to have a branch office in a particular city, yet its documents on that branch office (including supposed government documents) put that city in the wrong province.
- Company claimed to be bringing in twice as much product as physically possible on a particular ship.
- Company claimed to have won an IP lawsuit in a country's Supreme Court (they produced the alleged judicial decision), but there had never been such a case.

Talk to competitors and former employees. While you should always view what competitors and former employees say with a narrow lens, they can be excellent resources to help root out the fraudsters.

Supply Chain's New Protecting Your IP

Role in

Intangible assets and intellectual property (IP) are increasingly important in today's knowledge-based economy. Yet, all too often protection of a company's intellectual capital is controlled by the legal department, with most companies failing to take effective action to protect IP. Instead, organizations will find value from basing IP protection on more proactive supply chain practices, and on embracing a holistic approach to target social, environmental, and ethical responsibility throughout the supply chain.

By Barchi Gillai, Sonali V. Rammohan, and Hau L. Lee

Intellectual property (IP) has become the coin of the realm over the last few decades. In a knowledge-based economy, organizations are creating value through creations of the human mind, which can be commercially used, and may take the form of copyrights, patents, trademarks, registered designs, and trade secrets. By some estimates, as much as 75 percent of most organizations' value and revenue sources are in intangible assets, IP, and proprietary competitive advantages. Yet, the importance of IP is often overlooked by the supply chain.

While firms are adopting a more holistic approach to addressing social, environmental, and ethical issues, IP protection is rarely considered part of this approach at an operational level. Instead, IP protection is often managed by the legal department, with most companies failing to take effective strategic and operational action to lower their litigation risk and improve the likelihood of keeping their IP secure. In fact, a 2012 survey conducted by the Center for Responsible Enterprise and Trade (CREATe) with the Conference Board of Canada found that for 93 percent of surveyed companies, the legal department had primary responsibility for IP protection. Yet the same survey highlighted a lack of confidence in this traditional approach and a lack of results. Another hurdle limiting the effectiveness of IP protection strategies is the tendency of firms to operate in silos, with different organizational units determining their own IP strategy.

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For more information, visit http://www.gsb.stanford.edu/value-chain-innovation.

Given the shortcomings of common strategies, it is not surprising that IP rights violations and the lack of enforcement are widespread, creating a serious problem for multinational firms. The magnitude of the problem has been especially significant in China, where in 2011 the software piracy rate for personal computers was 77 percent. The commercial value of this unlicensed software was US $8.902 billion, according to the 2011 BSA Global Software Piracy Study. The impacts of other IP violations are even higher. A 2013 report of the Commission on the Theft of American Intellectual Property estimates the scale of American IP theft reaches over US $300 billion per year. The International Chamber of Commerce estimated the global economic and social impacts of counterfeit and pirated products at about US $775 billion in 2008; this was estimated to more than double to US $1.7 trillion by 2015. In addition to financial losses, illicit activities harm company brands and reputations. And at a higher level, IP theft is undermining both the means and incentives for entrepreneurs to innovate, which can slow the development of new inventions and industries, impeding growth.

Given the growing importance of IP and the limited success of existing strategies, should firms modify their approach towards IP protection? Could IP protection be modeled on successful socially and environmentally responsible practices?

While IP protection has been mostly siloed, a growing number of companies have been working to integrate socially and environmentally responsible (SER) practices into supply chain operations. Methods to promote responsible practices have become more sophisticated, and more resources have been dedicated to preventive measures and building supplier capabilities. For the most part, this more holistic and proactive approach seems to be having a positive impact on firms' abilities to drive improvement and reduce the rate of SER violations throughout the supply chain.

Given the growing importance of IP and the limited success of existing strategies, should firms modify their approach towards IP protection? Could IP protection be modeled on successful socially and environmentally responsible practices? We believe there are enough similarities where greater integration could prove valuable.

The Case for a Holistic Approach for Social, Environmental, and Ethical Responsibility

SER issues and IP rights violations differ in multiple ways. They may have a different impact on a company's top-line revenue, bottom-line cost, reputation, and brand image. Their origin points along the supply chain may not be identical. And while issues related to IP infringements vary based on the type of IP in question (preventing trade secret theft is managed differently than software piracy), the industry a company belongs to may have more of an impact on the SER challenges it faces.

Despite the differences between SER and IP, their underlying causes are often very similar. Consider, for example, the lack of visibility into suppliers' practices. Over the last two decades, companies have taken advantage of low material and manufacturing costs in countries like China, India, Indonesia, and Brazil. But geographic distances have made it very challenging to gain visibility into supplier practices. This limits the ability of companies to monitor and prevent labor and environmental violations as well as IP leakages.

In addition, suppliers often lack sufficient incentives to comply with social and environmental requirements or with IP laws. Providing workers with fair wages, limiting the number of overtime hours, and providing proper working conditions can cut from suppliers' profits in the short run; developing ways to reduce waste and minimize environmental impact may require large upfront investments; and using counterfeit parts or avoiding the payment of software license fees carries with it obvious financial benefits, at least in the short term.

Weak legal frameworks and law enforcement in emerging countries also contribute to the problem. China, for example, faces severe environmental challenges, yet the lack of legal environmental protection results in toxic living conditions and leaves advocates without tools to protect the environment and themselves. As for IP protection, while China has acceded to the major international conventions on IP rights protection and has created a comprehensive legal framework to protect both local and foreign IP, these laws have rarely been enforced due, in part, to the short-term economic benefits of piracy and misuse of IP.

Cultural differences also contribute to the problem. Consequently, China is now the world's single largest producer of pirated goods, with an extensive and sophisticated network of infringers who pirate products of virtually every industry. It is important to note that while beneficial to China in the short run, piracy has had unsettling

long-term effects on the Chinese domestic economy and economic goals. Consequently, China has started taking more steps to strengthen IP protection. But even with this new focus, it is likely to be a while before adequate levels of IP enforcement can be achieved.

Another similarity between the two areas that has been identified is the important role that employees play in implementing corporate strategy. In the context of IP thefts, research has shown that employees are often the leakage points of confidential information. With SER, employee awareness and understanding of corporate values are the basis for the successful implementation of SER into daily work.

The similarities between some underlying causes behind these issues suggest that several responsible supply chain practices linked with reduced SER violations may also be helpful in tackling IP infringements. Next, we'll explore this idea in more detail.

Responsible Supply Chain Framework

Exhibit 1 shows a proposed "Sense and Response" Responsible Supply Chain Framework, which is comprised of three main areas:

1. Management Systems. The management system lays the foundation for responsible practices across the supply chain, and is based on buy-in and leadership from top executives; dedication of sufficient resources; establishment of uniform policies and procedures across the supply base; and collaboration with peer companies on development of responsible practices.

2. Visibility Methods. Visibility can be defined as the increase of available data that can shed light on issues in the supply chain, and inform strategies to strengthen the supply chain. Visibility methods should help identify violations as well as shed light on areas of risk.

3. Response Practices. Response practices are actions taken in response to violations, or preventative measures that avert issues from developing into major problems. Actions taken in response to violations may include root cause analysis, corrective action plans, as well as monetary fines and other penalties. Preventive measures may include incentives to encourage compliance, supplier capability building, and proactive practices such as product and process redesign, improved information sharing, and providing suppliers with resources to allow them to address root causes independently.

A research study conducted as part of the Stanford Initiative for the Study of Supply Chain Responsibility identified a positive link between many of these practices and reduced SER violations. Our research suggests that senior management involvement, supplier collaboration and capability building, supplier incentives, and proactive practices aimed at preventing problems from occurring in the first place are associated with SER performance improvement and lower operating costs. We will explore how the same framework can be used to improve IP protection.

IP Protection in the Context of a Responsible Supply Chain Framework

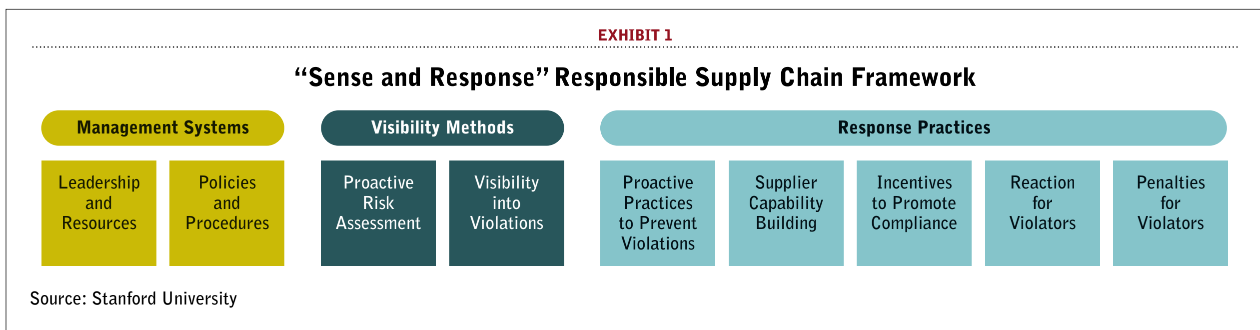
IP issues may involve criminal activity, such as theft of trade secrets or trafficking in counterfeit goods, or misuse of IP by legitimate businesses due to poor procedures, low awareness, and loose controls. Management literature provides guidelines on addressing these issues. Many of the recommended practices fall within the Responsible Supply Chain Framework, as illustrated in the following examples which are based on a 2014 research by A.M. Schneider.

• **Management Systems.** A mature management system can supplement the work currently done by the legal department, weave IP protection into the culture of the company and its operations, help to prevent IP infringement throughout the supply chain, and eliminate unintentional lapses. We highlight four aspects of management systems that can strengthen IP protection.

• **Leadership.** Because leakages can originate in various company departments and multiple nodes along the value chain, IP protection is difficult to coordinate and control. Large firms would do well to establish a central department, with head office support and cross-divisional

EXHIBIT 1

"Sense and Response" Responsible Supply Chain Framework



Source: Stanford University

function, to oversee IP management within the firm and throughout the value chain. Involvement of senior and top management as well as R&D is likely to further improve the protection of valuable IP. Having top management involved ensures awareness and enforcement of IP protection.

• **Policy.** Instead of different divisions and business units overseeing their own IP protection policies, the International Chamber of Commerce recommends establishing a corporate-wide policy from which to develop and implement IP strategies, procedures, and practices. The IP policy should also provide a framework for discussions with suppliers and other business partners regarding their own obligations with regards to IP. The IP policy should be refined periodically to ensure it continues to address evolving challenges. Siemens is one example of a company that has established a central Corporate Intellectual Property department, which coordinates the company's IP policies, protection measures, and strategies, while still allowing individual divisions to align their IP strategy to their business plans, environmental factors, and the institutional framework in the respective region of activity.

• **Evaluation and Assessment.** Naturally, not all IP affects a company's competitiveness in the same way. In order to improve resource allocation and increase the overall effectiveness of IP strategies, it is recommended that companies classify their at-risk IP into categories—e.g. high value, medium value, and low value—and develop tailored policies for each type.

• **Collaboration with Peer Companies and Associations.** Collaboration may help expose the sources of IP leakages and further the development of methods to resolve IP issues in developing nations. A number of related associations that aim to enhance IP protection already exist, such as the Open Group Trusted Technology Forum, CREATe, The International Electronics Manufacturing Initiative, The Conference Board, and The Common Criteria.

• **Visibility Methods.** While higher visibility alone cannot increase compliance, it is an important part of the process. Companies must first gain an understanding of risks and existing issues before they can determine how to address them.

Experts recommend that firms conduct risk assessments of new products, services, and business opportunities to identify IP protection risks. Due diligence and risk assessment on all relevant supply chain members are also recommended. Furthermore, firms should establish a system to routinely monitor their performance and that of supply chain members in meeting the company's relevant IP policies.

Suppliers can be monitored as part of holistic supplier assessments. Companies may also rely on supplier firms to control and communicate their IP protection policies and procedures, or they may monitor suppliers through audits. Audit results should be regarded cautiously though, as audit fraud can be widespread in countries such as China. An indirect way to detect IP infringement is through the review of suppliers' patent and trademark portfolio. The frequency of supplier monitoring should be based on the supplier's risk level for IP infringement and theft.

• **Response Practices.** Companies should use their available information to determine how to respond to violations that have already occurred, or to mitigate potential risks. Below are examples of response strategies that can be used to reduce the risk of IP infringements.

• **Proactive Practices to Prevent IP Leakages**. Companies should maintain physical and electronic security to protect their IP. Trade secrets and other propriety information should be made available to employees and third parties on a need-to-know basis, and subject to company procedures and confidentiality agreements. Technological innovations can also be used to safeguard IP, examples of which include encryption of confidential information; and restrictions on electronic documents so that they exist only for a limited amount of time, can only be accessed with a special code, or are restricted from being saved, forwarded, or printed. Similar mechanisms can also be integrated into products, such as the cryptosystem integrated into Microsoft's Xbox.

Another strategy involves system decomposition of the R&D process, in which only non-core, well protectable R&D activities are executed in emerging countries. System decomposition may also take place at the production level. For instance, Cree Inc., a U.S. based manufacturer of light-emitting diode (LED) lights and components, manufactures LED wafers in the U.S., then transports the components to China for integration into the final product. Former Sony Ericsson has restricted its international outsourcing to the production of aging products only, so as to protect new and highly valuable IP and product ideas in countries with strong enforcement.

Because employees are among the most vulnerable IP leakage points, attention should be paid during the recruiting process to the related risks, and new employees should be required to sign non-compete and non-disclosure agreements. Employees and suppliers who operate with confidential business information and high-value IP should also be trained periodically so they understand the importance of IP for the company, the need

EXHIBIT 2

SER and IP

		Social and Evironmental Responsibility	Intellectual Property
Similar	Cause of Lapse	Lack of enforcement, incentives, visibility, training	Lack of enforcement, incentives, visibility, training
	Effect of Penalties	Limited	Limited
	Supplier Selection	Very important	Very important
	Management Framework	Management systems, "sense" and "respond"	Management systems, "sense" and "respond"
	Proactive Practices	Product/process redesign, capability building, incentives	Product/process redesign, capability building, incentives
Different	Tangible vs. Intangible	More tangible (e.g., product sustainability, child labor)	Tangible (e.g., counterfeits) and intangibles (e.g., trade secrets)
	Lapses Occur...	Mostly upstream	Upstream and downstream

Source: Stanford University

to protect the company's and third party's IP, and what is required of them.

• **Supplier Selection and Capability Building.** Enforcing IP protection at a supplier site is a challenge, given the little control companies have on suppliers' internal operations. Therefore, managers should assess new suppliers' abilities and willingness to protect third party's IP. The supplier selection process should include evaluating the maturity of their IP protection program, and characteristics such as their technological capabilities and level of integrity. Since theft can take place at multiple nodes along the value chain, distributors should also be assessed in addition to suppliers.

After selecting suppliers, the type of relationship developed may impact the supplier's access to sensitive and high-value IP, as well as their motivation to avoid IP violations. Relationships should therefore be based on the complexity and novelty of the supplier's products or components, and the type of information that must be shared with them.

Sometimes, suppliers and other business partners may need guidance to determine the best way to safeguard IP. Buying firms can provide training, help identify risk factors, share best practices, and more.

Rather than working with unaffiliated suppliers, some companies may prefer to set up majority-owned joint ventures in emerging nations. Terex Corp. is one such company, which prefers Chinese joint ventures with majority ownership to oversee IP handling within the company. Still, companies should be careful when participating in such a form of collaboration, as joint ventures have been often used in the past by Chinese companies to get access to and steal confidential corporate information.

• ***Incentives:*** It is uncommon for multinationals to offer suppliers any incentives to elicit IP compliance. But IP infringements may carry with them financial benefits to the violating party, and safeguarding confidential information requires financial resources. Companies would therefore do well to re-evaluate this practice, and consider offering their suppliers incentives tied to IP protection. The prospect of a long-term relationship with the buying company is one way to motivate the supplier to take action to minimize IP theft. Some companies, such as Microsoft, incorporate IP protection into their supplier scorecard. If future business engagement and financial relationships depend on the supplier's score, they may be more prone to protecting IP.

• ***Reaction to Violations:*** When an IP rights violation is identified, one choice is to take legal action. But the buying company should also investigate how the IP leakage was made possible and build and help implement a corrective action plan. It can be valuable to involve the violating supplier in this process. Sometimes companies may prefer to forego the legal route and focus on corrective action. This was the case with a global consumer electronics company, which discovered in 2010 that its largest licensed distributor was selling knockoffs to retailers, mixed in with legitimate product. Even though legal action was warranted, it was not an attractive option. Instead, the company implemented new procedures to prevent counterfeits from entering the supply chain and rolled out new controls, resulting in complete elimination of the counterfeit problem within a year, while maintaining good business relations with the distributor.

• ***Penalties:*** Large firms may try to enforce their IP rights through legal measures, which in some cases may lead to high fines and prison sentences. However, legal frameworks and laws for IP rights vary around the world, and law enforcement is often weak, especially in emerging nations. This may limit the effectiveness of lawsuits as an instrument for deterring IP violations.

In summary, with the growing importance of intangible assets and IP and the shortcomings of existing IP protection strategies, the time is ripe for revising these strategies. Moreover, companies' stronger emphasis on IP protection is likely to cascade to their direct partners, and then to further tiers of the supply chain, creating greater value for all parties involved.

Faster

Fulfillment as a Competitive Advantage

Almost every company is working to reduce the time it takes to get an order to a customer's home and replenish its stores. But while faster fulfillment and small order sizes make marketing, customers, and store managers happy, that faster fulfillment comes at a cost. Companies that take the time to build a business case for faster fulfillment often find the benefits far outweigh the investment costs.

By Russ Meller

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The bar has been raised. Almost every company is working to reduce the time it takes to get an order to a customer's home or to its stores. They are following Amazon's lead in offering next-day, and even same-day delivery. A recent survey showed that 65 percent of buyers want next-day delivery. And another survey showed that 24 percent of online buyers said same-day delivery was important to them. All of this is putting pressure on retailers as well as industrial distributors to rev up their cycle times for fast, faster, and fastest fulfillment times compared to their competitors.

While Amazon is in the news, this is not just an e-commerce arms race. Companies are moving faster to replenish their stores too, in order to keep less inventory at each retail location and cut inventory across the entire network.

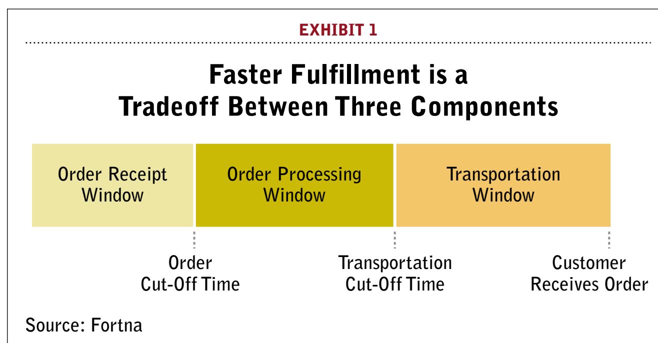
It's not just cycle and fulfillment times that are changing; there has also been a fundamental change in the profile of those orders being fulfilled. E-commerce orders are typically one to two items. Store replenishment order profiles are also getting smaller, and are beginning to resemble e-commerce orders, as stores receive cartons and mixed cartons several times a week rather than pallets and mixed pallets less frequently. One specialty retail client now carries only a single unit of its slowest-moving products on its retail shelves. Yet, thanks to a faster store replenishment model, the retailer has increased its in-stock position from 90 percent to 97 percent while decreasing inventory by 25 percent. As with e-commerce, single item and partial case orders are harder and more expensive to process. Any company in the retail or industrial fulfillment business has to balance the competitive pressures to satisfy its customer expectations while minimizing the costs of extra handling and speedier delivery. We believe the following methodology demonstrates that an investment in faster fulfillment can deliver a competitive advantage for a wide variety of companies.

A Model for Considering Faster Fulfillment

Faster fulfillment is a tradeoff between three components of an order: the Order Receipt Window, the Order Processing Window, and the Transportation Window. A useful model as we consider the challenge of faster fulfillment is represented in the figure below (Exhibit 1).

EXHIBIT 1

Faster Fulfillment is a Tradeoff Between Three Components

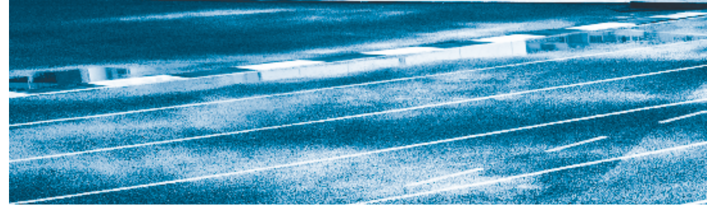


Source: Fortna

The three components are defined as follows:

• **Order Receipt Window:** The time window in which orders are received between two consecutive order cut-off times.

• **Order Processing Window:** The time it takes to process an order in the distribution center, including picking, packing, labeling, and loading it on a truck for shipment to the customer or store before the transportation cut-off time.



• **Transportation Window:** The time it takes to transport the good to the customer or store once it has been shipped from the distribution center.

With this model, it is clear that faster fulfillment (i.e., shortening the Order Processing Window) will allow a company to move the order cut-off time to the right (and a later cut-off time provides better service to customers) and/or move the transportation cut-off time to the left (doing so will allow access to a larger market or may allow for a reduction in transportation costs). Which response a company chooses depends on many factors, from the strength of its brand, to its average price per unit, to the competitive environment, as well as the cost to achieve a particular order processing window.

Fast, Yes, But at What Cost?

Faster fulfillment makes a lot of people happy. Marketing people are thrilled to offer later cut-off times to grow their online business. They also like that their stores are replenished more often.

But as we stated above, faster fulfillment and smaller order sizes come at a cost. In fact, a recent article in the *Wall Street Journal* estimated that filling e-commerce orders can run as high as 25 percent of sales for retailers that outsource their fulfillment. Moreover, high-profile retailers such as Kohls, Walmart, Target, and Best Buy are seeing reduced margins or outright losing money on e-commerce sales. While faster fulfillment and replenishment are becoming the cost of doing business, the CFO might not appreciate why distribution costs are going up compared to the good old days of weekly fulfillment in bigger batches of cartons and pallets.

The impacts go beyond distribution. It may also require you to:

• *Rethink your network strategy;* where you place your physical buildings and how to allocate inventory among those nodes to speed up delivery to the customer and reduce transportation costs.

• *Rethink your transportation strategy;* trying new carriers or processes, like zone skipping, for a cost and service impact.

• *Make big changes to your distribution centers.* A distribution center with a day-long window for processing orders looks very different than a distribution center with a one-hour window. And some changes to enable speed may be counterintuitive. Parallelizing processes and consolidating orders before packing can add "touches," which seems to go against the basic principles of lean distribution, but with the goal of faster order fulfillment overall.

The reality of all of this is hitting home. How do companies get thousands of smaller orders accurately picked, packed, and on the back of a truck before that crucial "order cut-off" time? And how do they pay for it all?

Don't Overlook the Benefits

While a significant investment may be needed to speed up fulfillment, there can be significant benefits, too. The problem is that those benefits often lie outside the area of the company that is incurring the cost to make it happen. To justify investments, you and your CFO have to take a very broad look at the benefits—beyond your distribution operations—in purchasing, forecasting, sales, and inventory management.

Later order cut-off times that increase sales. In the e-commerce channel, faster fulfillment means you can offer a later order cut-off time. If your last UPS pickup is at 4 p.m., and you speed up your order processing to under an hour, then you can move your order cut-off time to as late as 3 p.m. and still get the order on the truck that day. And in e-commerce, the company with late order cut-off times and fast delivery often wins. The trick is to get the revenue owner to agree that a later order cut-off time will have a positive impact on sales and to quantify that impact.

Faster fulfillment that expands your potential customer base. Faster fulfillment may open the market to additional customers. You may gain e-commerce customers who are speed sensitive. Or, for companies that have strict delivery deadlines, like pharmaceutical companies shipping to hospitals and pharmacies, faster fulfillment might give you more time to transport the goods and realize a larger geographic reach.

Faster order processing that cuts expediting fees. Some companies are forced to expedite a fair percentage of shipments to meet their service-level commitments and delivery promises. By speeding up fulfillment, they may be able to ship orders using less expensive shipping options and cut their transportation costs.

More frequent fulfillment that reduces inventory. In retail replenishment, the benefits are equally appealing. When a retail store is confident it will receive replenishment orders quickly, it is freed from the burden of keeping high levels of inventory as safety stock. Across a distribution network, that can result in a significant reduction in inventory and significant savings. By speeding up fulfillment, decisions about where to deploy inventory can be made later in the process, increasing the chance that product ends up in the place where it's most needed to meet demand. Utopia is a "sell one, replenish one" model, where a purchase today

sparks a replenishment by tomorrow, or even today.

The Virtuous Cycle

There are additional benefits derived from an investment in faster fulfillment beyond the immediate payoff we just described. Think of them as a "virtuous cycle." By that we mean that once the planned benefits at the distribution center are realized, an organization begins to realize unplanned benefits. Those unplanned benefits, in turn, cycle back to the distribution center and result in additional benefits. This can often have a cascading effect.

Take for example a sporting goods company that made an investment to reduce its order lead time. This resulted in the distribution center providing better service to the retail stores. That was the planned benefit. The virtuous cycle? Over time, due to the better service, store managers began to keep less safety stock because they knew they could get any item replenished the next day. As a result, orders from the stores were smaller and once combined at the distribution center, there was less "lumpiness" in the demand placed upon it that allowed the distribution center to carry less inventory. In addition, there were fewer expedited orders, which led to a smoother process in the distribution center. By carrying less inventory and improving its processes, the distribution center was able to reduce its order lead time further. The virtuous cycle.

Along with these changes, less safety stock at the stores freed up space in the backrooms and on store shelves, which was redeployed to offer a broader array of products and hence, additional revenue. Meanwhile, the backroom was redeployed to enable "ship from store" orders that further improved fulfillment time to local customers and helped the retailer sell through inventory and avoid markdowns. A snowboard in a store in Virginia might be shipped to a customer in Colorado rather than get marked down at the end of the season. In short, the long-term payoff is broader as short-term improvements build on each other.

Justifying Investments in Faster Fulfillment: Case Studies

How you develop a business case for faster fulfillment is based on the factors listed above in conjunction with the decision on whether to move order cut-off times, transportation cut-off times, or both. As examples, here are three case studies of companies that found a positive ROI in faster fulfillment based on the broader business case. The case studies will be contrasted by showing the leverage points of order cut-off time and transportation cut-off time.

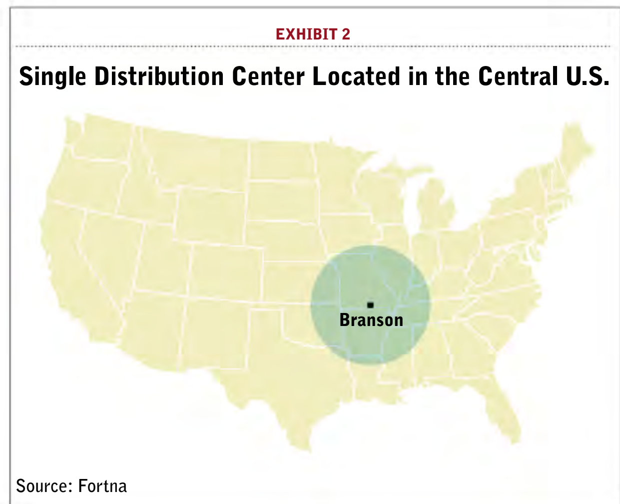
Case Study #1: Regional Pharmaceutical Distributor

Order Processing Window: Reduced from 4 hours to 1.5 hours (63.5%)
Transportation Window: Extended from 7 hours to 8.5 hours
Investment: $11 million
Impact: $100 million in additional annual revenue

This regional pharmaceutical distributor has a single distribution center located in the central U.S. (see Exhibit 2, not their actual location). In this market, next-day delivery is essential, with most hospitals requiring that their orders arrive by 6 a.m. the next day. With an order cut-off time of 7 p.m., and a four-hour order processing window, that gave them from 11 p.m. until 6 a.m. to deliver their goods. This seven-hour transportation window gave them a range, or market size, of approximately 350 miles around their distribution center.

EXHIBIT 2

Single Distribution Center Located in the Central U.S.



Source: Fortna

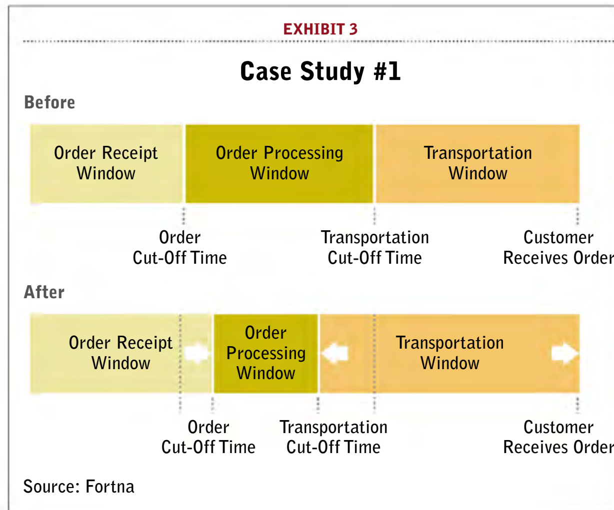
After careful analysis, they invested in distribution center automation to shrink their order processing window. They implemented two different highly automated solutions for their fast-movers and slow-movers that allowed them to process a large number of small orders at a low operating cost. The solution they chose processed over 2,400 orders an hour—a significant improvement over their manual picking process.

In addition, they "parallelized" the picking process in their distribution center. Rather than have a single tote travel the length of the building, they split the distribution center into zones. The items in each zone were picked

concurrently and the totes were consolidated into a complete order at the end, cutting the processing time.

The combination of changes reduced their Order Processing Window by two and a half hours, from four hours down to one and a half hours. They chose to invest some of that two and a half hour savings into moving their cut-off time one hour later to make them more in line with competitors. The net impact increased the Transportation Window by 90 minutes (Exhibit 3).

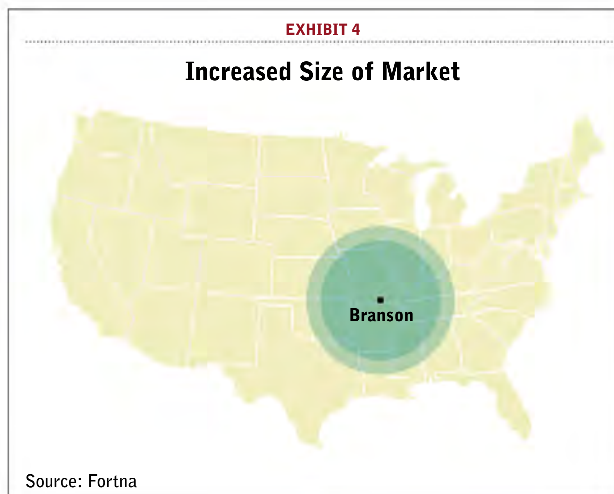
EXHIBIT 3



Source: Fortna

With the longer transportation window, the company's trucks could travel an additional 75 miles before the 6 a.m. delivery time to hospitals. That additional 75 miles increased the size of the market they served by nearly 50 percent, including some key metropolitan areas, and helped them acquire new accounts (Exhibit 4). The additional customers brought about by these changes boosted revenue by over $100 million annually.

EXHIBIT 4



Source: Fortna

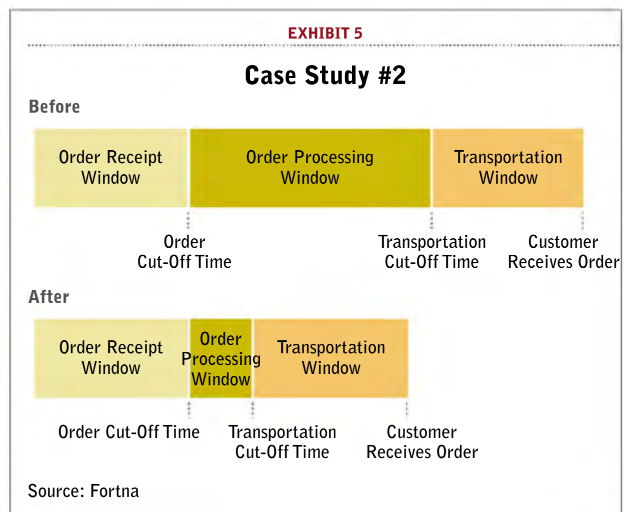
Case Study #2: Off-Price Outlet Retailer

Order Processing Window: Reduced from 8 days to 2 days (75%)
Investment: $9 million
Impact: $6 million in annual savings

This off-price outlet buys in bulk when they find great deals on clearance and off-season merchandise. That inventory comes to a central distribution center where it is allocated and then transported to each individual retail store. The retailer has ownership of approximately $250 million of inventory, with about 10 percent of that "in process" in their distribution center at any point in time.

With time-consuming manual processes like double sorting (by color and size) and value-added services like inserting hangers, the Order Processing Window was a lengthy eight days (Exhibit 5). If the retailer could cut Order Processing Time to two days, taking six days out of the process, it could significantly cut inventory levels and the associated investment.

EXHIBIT 5



Source: Fortna

To do that, existing manual operations required significant changes. The retailer implemented:

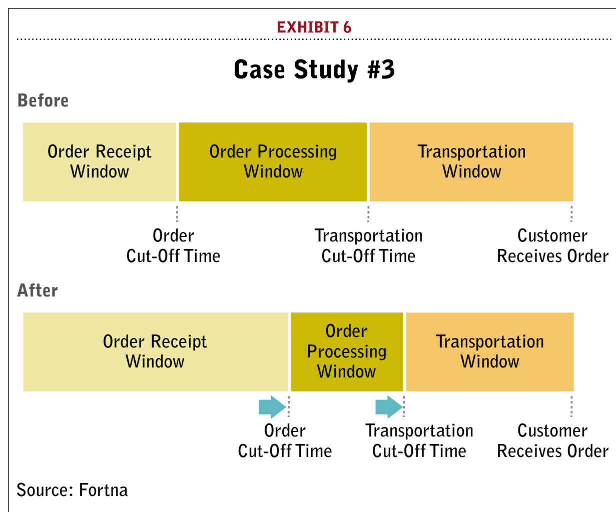
- technology that uses lights to improve the productivity of pickers;
- materials handling systems for conveyance, sortation, and automatic tote labeling to enable parallel processing; and
- new systems for warehouse control (WCS) and warehouse management (WMS).

All in all, approximately $9 million was spent on the upgrades, with roughly 75 percent on materials handling equipment and 25 percent on software upgrades. But the results included a permanent reduction of almost $6 million in inventory holding costs, freeing up that capital to be reinvested in the business.

Case Study #3: Global Electronics Distributor

Order Processing Window:	Reduced from 4 hours to under 30 minutes (85%)
Order Cut-off Time:	Moved from 6 p.m. to 8 p.m.
Investment:	$24 million across 4 Distribution Centers
Impact:	Doubled revenue (over $1 billion) with no corresponding increase in distribution cost.

This large electronics distributor competes by focusing on high-end customer service. Customers, who use their equipment in the manufacture of their own products, are willing to pay for this added service. This distributor goes so far as to offer a money-back guarantee if items are not received the next day. Their goal was to have the latest order cut-off time in the industry—as late as 8 p.m. in some markets—and still meet their promise of next-day delivery. With over 600,000 items in their distribution centers, this was an aggressive goal.



Source: Fortna

To meet this aggressive order cut-off time, they implemented:

• a new Radio Frequency (RF) system that sends orders to pickers electronically;

• a parallel picking process where orders are split and sent to associates who pick the items in their areas then place them in totes that are consolidated through an automated sorter;

• an automated packaging system that right-sizes a carton around an order, inserts promotional materials, and labels and seals the carton without manual intervention; and

• transportation "zone skipping," where the order is transported by company trucks to a UPS hub with a later shipping cut-off time to allow more time for processing orders.

The investment in technologies and process improvements across four distribution centers totaled over $24 million. But the late order cut-off time and the service promise of "next day delivery on qualifying orders placed before 8:00 p.m." contributed to the company doubling its revenue over the past few years (Exhibit 6). Moreover, implementing these new technologies and services resulted in a 70 percent gain in productivity with no corresponding increase in distribution costs.

Fast, Faster, Fastest

With all the talk of drones, ship from store, and same-day delivery in urban areas, it's unlikely we'll see a cease fire in the arms race for fast, faster, and fastest fulfillment any time soon. If anything, the stakes will continue to get higher. At the same time, based on the experience of major retailers like those cited by the *Wall Street Journal*, faster fulfillment comes at a cost and has far-reaching impacts beyond distribution operations. The winners in the arms race will be the retailers and distributors who can control their costs even as they speed up their fulfillment operations. The best—those who make investments in fulfillment—will gain a competitive advantage in the market.

The first step is to quantify the benefits that faster fulfillment will bring. To do that, you need to look broadly—beyond the distribution center and beyond supply chain. You need to find the justification for the investment outside of the area of the company that will incur the cost to make it happen.

But don't doubt that the benefits can be justified. Faster fulfillment, when executed correctly, can lead to significant inventory benefits, fewer markdowns, later cut-off times that attract more customers, and a more consistent fulfillment process overall. When these benefits start to show up, a virtuous cycle begins that accelerates those benefits even more by lowering costs at the distribution center.

How They Did it: Purchasing Competency Procurement Innovation *at* Molson Coors

By Hamish Walker and Patrick Penfield

Hamish Walker is the Chief Procurement Officer of the Molson Coors Brewing Company. He has worked in the brewing and leisure industry for over 20 years and is a veteran of a number of acquisitions and mergers, and subsequent international procurement synergy programs. He can be reached at Hamish.Walker@molsoncoors.com.

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Innovate, innovate, innovate. That could be the mantra for business today, as the battle to be first to market with a new product intensifies. Regardless of the industry, companies are launching new products and extensions of existing products at a dizzying pace. Every facet of the organization is under pressure to come up with new ideas.

In many businesses, product innovation is driven through the marketing and engineering departments. However, several progressive organizations are now driving innovation through their procurement groups. Top management is tasking these purchasing organizations to tap into the expertise of their supply base to collaborate on the development of new product opportunities. This is a different way of thinking about procurement that requires new processes and a structure to support innovation. Can all companies move down this innovation path? And if so, what processes should be employed to help purchasing professionals drive innovation from their supply base?

Those are questions asked—and answered—every day in the procurement organization at Molson Coors Brewing Company. This is the story of how we implemented a five-step process to drive procurement innovation.

Building on a History of Product Innovation

Product innovation is as central to Molson Coors' culture as the Rocky Mountains. In 1959, Bill Coors and his team developed the first recyclable aluminum beer can. This innovation reduced

In many businesses, innovation is driven through marketing and engineering. At Molson Coors, procurement has deployed a five-step process to drive innovation at one of the country's best-known brewers.

packaging waste and also allowed beer cans to be recycled. Coors also made this innovation available to the rest of the beverage world. Today, Molson Coors continues that tradition of innovation through its cold activated bottle and cans, vented can ends and other aluminum packaging innovations, as well as multiple new flavors and styles of beer.

Despite that heritage, developing innovations is a constant challenge for Molson Coors, as it is for all organizations. While innovations can be found within all facets of an organization in today's business climate, we made a conscious decision several years ago to work with our suppliers on the development of new products. After all, suppliers are often experts in the materials and services they offer. Moreover, suppliers are exposed to best practices across their customer

base, where a company like ours has a view that may be limited to our operations. At Molson Coors, we wanted to tap into this rich resource.

Change like this, however, is not easy. When we started down this supplier innovation path, we knew it was important that our suppliers understood our commitment to work with them on this new process. Over the years, we had challenged our suppliers to be more innovative. Too often, they were frustrated, and eventually cynical, when they submitted ideas that disappeared without a trace, never to be heard from again. In procurement, we often struggled to convince our marketing colleagues that a supplier had delivered a truly innovative idea. Meanwhile, like many companies, we spent money with creative agencies on ideas that took a long time to commercialize. Unfortunately, communication often broke down and our marketing team viewed procurement as focused only on cost savings and our suppliers as stuck in their ways.

The goal of the initiative (supplier innovation process) was to facilitate a process that could create real value from combining the creative value of Molson Coors and our relationships with our supplier community.

Launching Supplier Innovation

The status quo began to change three years ago, when we introduced a supplier innovation process. The goal of the initiative was to facilitate a process that could create real value from combining the creative value of Molson Coors and our relationships with our supplier community. The first step to making this a reality was to ensure that our suppliers understood the challenges we were setting out to tackle throughout the organization. In procurement, we had to ensure that our marketing teams and our suppliers were closely involved from start to finish. Decisions had to be clear, communicated well, and understood. Done well, great ideas would have an opportunity to thrive without the risk of the "not invented here" syndrome. Those goals led to the development of a five step process.

Step 1: Focal Point: Select a Person to Drive the Innovation Process. The first step to kick-start the process was to appoint a Procurement Innovation Manager. This person's sole purpose was to drive innovation from our suppliers all the way to the marketplace. The Procurement Innovation Manager designed an approach that would allow innovation to flourish, but at the same time was disciplined to ensure that a process was repeatable. The manager's first objective was to help suppliers "connect" with Molson Coors' challenge by giving them as much information as possible to help them understand what we were trying to achieve. Without this understanding, it would hardly be surprising if suppliers failed to meet expectations.

Step 2: Communication: Develop a Brand Brief for the Supplier. Step 2 was to work with our marketing and technical innovation colleagues to create and present a brand brief to our suppliers. Each brand has a personality, or an essence, that combines its functional characteristics with its emotional benefits. How an innovation from a brand is interpreted by a consumer will depend on that brand's personality. For example, a consumer's expectations from a brand such as Coors Light is quite different from what consumers expect from Staropramen, a Czech beer we acquired in 2012. Coors Light is a beer that is all about cold refreshment; Staropramen has a story that defines the quality and heritage of the Czech brewing tradition. That's not to say that the same innovation might not work for both brands, but the reason it works may be quite different. Those brand nuances needed to be explained from our perspective.

Rather than start with a product or pack type, we chose instead to start with a specific brand. The organization felt this was the best way to define the challenge. The objective of the brand brief stage was to help our suppliers get "under the skin" of the brand and understand its identity. The brief also discussed the challenges we face and what we want to do to

Continued on page 50

Developing a Purchasing Competency Model

By Hamish Walker and Patrick Penfield

While Molson Coors now relies on its supply base for innovative new ideas, not all marketing and innovation professionals will accept or be excited by innovation brought forth by its procurement organization. However, many times procurement personnel can connect the right people within the various organizations and ensure that the needs of both sides are clearly articulated and understood. In today's world, branded consumer goods are seeing the most benefits from this approach. Other industries can also benefit from using procurement personnel to stimulate innovation.

What's needed to drive procurement innovation within an organization? A purchasing department must have the right skill sets and culture to bring innovation to an organization. Purchasing departments throughout the world are at different levels of competency which could impact their ability to extract innovation from the supply base. The model above defines where a purchasing department maybe operating from in regards to a level of competence.

Purchasing Competency Model

Purchasing Competency Model
4th Phase—Innovation
3rd Phase—Stategic
2nd Phase–Tactical
1st Phase—Transactional

Purchasing's State of Competence

The first phase in the purchasing competency model is called the transactional phase. Purchasing departments are more focused on making sure materials and services are brought in for the company to make or sell. Usually, a new company is more focused on sales and trying to grow their business versus purchasing excellence. Many times the people in this department have not received proper training in purchasing and innovation is almost non-existent.

The next phase in the competency model is the tactical phase. A purchasing department within a company begins to mature and become more integrated in the operations of the company. This purchasing organization is starting to use processes and develop procedures on how to manage their supply chain from a day-to-day standpoint. The purchasing skill sets within the department are now starting to develop through experience, training and the hiring of new employees who are experienced in sourcing. The innovation focus at this stage is usually on streamlining processes and procedures.

The third competency phase is the strategic phase, where the purchasing group is now focused on reducing costs while improving the quality of the materials and services they purchase. The personnel in this department are experienced and have great purchasing skill sets. The innovation process is focused more on new sourcing tools and strategies to drive down costs, improve quality and service, and to improve the supplier's capabilities.

The fourth and final phase is the innovation phase. Companies look for purchasing to continue reducing costs and improving quality, but are tasking the purchasing organization to help drive innovation within the company. In this phase, purchasing creates value or extra revenue through the supply base. Suppliers are now an extension of the new product creation process. The purchasing personnel are very experienced and function well in cross-functional teams. Product innovation ideas are now starting to flow from the suppliers to the business.

In order for sourcing departments to participate in the product creation process, they should be at the innovation stage. The purchasing organization can act as a catalyst within a company to drive innovation. In order to do this a system and structure must be in place to facilitate this process.

In the beginning of the innovation phase, purchasing departments must ensure that suppliers understand their brands and their significance to the marketplace. If a supplier comes up with their own brand assumptions, they can be misaligned with what the organization is trying to do with the brand and this could quickly damage the credibility of the purchasing innovation process. This could have a disastrous impact on the organization and bring the supplier innovation process to a standstill. The ideas that are generated from suppliers are then taken via purchasing to the organization and are rated on the revenue or cost-saving opportunities they could generate. Once a consensus is reached by senior management the ideas are then prioritized based on best opportunity for the firm. They are then taken to the product creation process and worked on until product introduction.

Once the product is introduced, the supplier's ideas are measured to determine success. Remember that sometimes innovations may be ahead of their time. For instance, Corning invented a product known as Gorilla glass in the 1960s that found little commercial use until the invention of the smartphone nearly fifty years later. The lesson is that it is not uncommon for an innovation to take many years to become an overnight success; an idea that does not work now, may work in the future.

change or reinforce our consumer's understanding of the brand. According to Steve Jobs: "Creativity is connecting things….." In that light, the intent of the brand brief was to give our partners as many high quality data points as possible to connect.

Today, the brand briefs are part of our presentation when we first sit down with a supplier. As part of the Molson Coors procurement innovation process, we use a cross-functional team (procurement, technical innovation, and marketing) to make the presentation and to drive the innovation process. This ensures that all the right expertise is in the room to address questions and to have an informed discussion about the brand. This also helps to make sure each discipline is equally invested in the process and is fully motivated to make it work.

Close involvement of supplier partners through timely decision making and feedback is critical to making a supplier feel that it is time well spent.

Step 3: Supplier Engagement on Innovation Ideas. Once our suppliers have this deep understanding of the brand, we ask the supplier to develop ideas for our products. We insist they look at everything about the product and give them free reign on idea generation. The supplier needs to make linkages between what we want to achieve for the brand and what they know about the materials they make and supply. During our second meeting, the supplier presents its ideas. In this meeting, we are looking for ideas that are directly linked to the brand. Our cross functional team is present to hear the ideas first hand; usually the supplier will also have its own cross-functional team at the meeting. Having all the right people from both sides allows us to quickly address any questions or concerns (e.g. questions on practicality and operational efficiencies). Many ideas will be collected at this stage of the innovation process.

The Molson Coors Procurement innovation process requires us to capture all of these ideas and place them in an innovation knowledge bank. This can then be reviewed on a regular basis to see if a particular innovation idea makes sense to pursue at this time. It's not uncommon for an innovation to take many years to come to fruition. Even if an idea is not right for the market now, it may work in the future. The innovation ideas that are presented at our meeting are now discussed by both teams and filtered down into a manageable selection that will be put into consumer testing. This is a great way to understand how customers will accept the innovation proposed by the supplier. The process takes time, money, and effort. However, having the right commitments and resources agreed up front helps the process run quickly and effectively.

Close involvement of supplier partners through timely decision making and feedback is critical to making a supplier feel that it is time well spent. That way, the integrity and credibility of the process is maintained, even if a supplier's idea is not carried forward. Momentum is also important so that progress and tangible results are apparent as soon as possible. Once we have a positive consumer response and formal acceptance by the Molson Coors innovation team, the innovation will enter our stage gate process.

Step 4: Product Innovation Release. Within Molson Coors, new innovations ideas and concepts go through a formal project management product creation stage gate process. A new product idea is presented by members of the team and must be approved by management before it receives any funding. Once funding is received, the product innovation team is required to meet its deliverables before it can move on to the next stage. At each stage of the product creation process, the team must show how the innovation will improve or innovate the brand. Once this is demonstrated, the resources and funding are allocated for the next stage. It is also possible that changes will be made to the scope of the project as more information is learned. Once again, all relevant functions are represented at the stage gate meetings to ensure that all aspects of the project are taken into account. Having made it through the entire process, an innovation will be launched into the

market. How long this takes varies greatly and depends on a number of factors, such as the level of technical development required, and the alignment with marketing and customer plans. Very often new innovations are launched in a limited market. These pilots reduce risk and allow us to test and refine the innovation under real market conditions.

Step 5: Measuring the Success of the Innovation. Once a new product is launched, all new innovations are tracked on a monthly basis in order to evaluate their performance against the original business case. That allows course corrections to be made as required. During the annual planning cycle, commitments are reviewed based on ongoing performance. Contractual requirements with suppliers are also reviewed to ensure that suppliers are meeting their goals. Quarterly debriefing sessions are an opportunity to review what went well, what did not go well, and to discuss how to improve the process in the future. Many times, successful new innovations are analyzed to see if they can be used elsewhere within Molson Coors.

Continual Innovation

The desire of everyone involved in many innovation programs is to come up with "the next big thing." Companies must realize that failure does occur within the innovation process. "Home run" innovation ideas come along very infrequently and part of the innovation focus has to be on innovating current products. In a highly competitive and overcrowded market, the winners will be companies that can identify or create new niches and then exploit them through innovation. It's very difficult to predict what these opportunities will be, and most innovations will be challenged. If we look at nature, we see that organisms evolve and survive by generating multiple variants each generation, and it is the variants that happen to be best suited for the particular set of circumstances at that time which is successful.

Companies must realize that failure does occur within the innovation process. "Home run" innovation ideas come along very infrequently and part of the innovation focus has to be on innovating current products.

Similarly, consumer markets are increasingly fast moving and unpredictable. It is the role of an innovation program to create a full pipeline of relevant ideas that can be rolled out to market as opportunities arise. In order to develop an innovation pipeline, more expert minds have to be engaged. In today's world, the opportunity exists to involve people across the supply chain. As we have learned through our five step process at Molson Coors, suppliers can assist in keeping this pipeline full. To tap into this rich well of potential ideas, organizations need to develop relationships with their supply bases that will invigorate the innovation process. Having a disciplined process behind this not only helps increase efficiency, but also helps to build trust and credibility with all involved. That, in turn, should create a strong track record of success. To predict what our consumers will be doing and how they will be using products in 10 years' time is difficult to determine. If we challenge ourselves on a daily basis to refine and improve innovation processes, we should be able to keep up with the consumers changing preferences and win in tomorrow's world. That's among the most important lessons we have learned over the last three years at Molson Coors.

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SUPPLYCHAIN MANAGEMENT REVIEW

2014 VIRTUAL CONFERENCE

Supply Chain Transformation: Meeting the Omni-channel Fulfillment Challenge

In our 10th annual Virtual Conference Event, thought leaders across all facets of logistics and supply chain management set out to help managers better understand evolving omni-channel trends and shed new light on the best practices for effectively managing this complex operational environment.

By Bridget McCrea, Contributing Editor

For both retailers and manufacturers, the pressure is on to deliver anything, anytime, from anywhere—and the momentum to improve service levels is only building. Welcome to the new world of omni-channel fulfillment, a place where mobile technology, wireless networks, and e-commerce capabilities have collided to create a new slew of challenges for supply chain managers, logistics and transportation managers, as well as warehouse and distribution center professionals.

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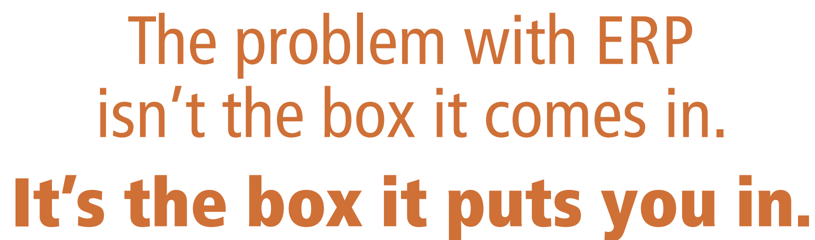

The old-fashioned software-based approach to supply chain management definitely has its limits. But what's really unfortunate is the limit it puts on your company's global trading potential. At GT Nexus, we set you free by putting your entire supply chain in the cloud. ERP is slow; the cloud is fast. ERP is expensive; the cloud is cost-efficient. ERP leaves you talking to yourself; the cloud gets you talking with your whole network. On-demand and in real time, you'll be able to respond to every opportunity and every challenge with the kind of speed and precision you've never known before. It all translates into higher profits. Isn't it time you started thinking outside the box?

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This year, *Logistics Management* and *Supply Chain Management Review* joined forces to develop an exclusive Virtual Conference Event designed to help logistics and supply chain professionals better understand evolving omni-channel trends and shed new light on the best practices for effectively managing this new operational environment.

Titled *Supply Chain Transformation: Meeting the Omni-channel Fulfillment Challenge*, the conference assembles an impressive lineup of educational sessions, top-notch speakers, and valuable resources. From an exploration of omni-channel's effect on supply chain management to creating the mobile supply chain to the critical nature of transportation management systems (TMS) in this new world, the event sessions span a broad range of best practices and critical information for today's supply chain professionals.

Let's explore each of the sessions and share what attendees took away from the event, which is now available on demand online at **scmr.com/2014_vc_bestpractices**

Keynote: Omni-channel's impact on supply chain management

In this year's Keynote address, Sears' supply chain leaders give attendees a 30,000-foot-view of the state of omni-channel fulfillment from their unique perspectives and offered their insight into best practices and top strategies for logistics managers.

During the keynote, Bill Hutchinson, senior vice president of supply chain for the venerable retailer, and Jeff Starecheski, vice president of logistics services, explore how they implemented an omni-channel fulfillment strategy as a way to improve the overall customer experience.

"Managing a business today is fundamentally different than it was 30 years ago," says Starecheski. "The most profound difference is the level of complexity people have to cope with." For example, he points to the fact that many companies that once functioned within simple, self-contained markets now face competition from unexpected players.

"Retail is now constantly changing, and changing fast. Digitally-enabled customers are empowered with information at their fingertips that wasn't available to them just a few years ago.

—Jeff Starecheski, vice president of logistics services, Sears

"Retail is now constantly changing, and changing fast," adds Starecheski. "Digitally-enabled customers are empowered with information at their fingertips that wasn't available to them just a few years ago. Today, customers have a mall in their hands and they can shop using finger strokes versus footsteps."

The question remains: How does the retailer differentiate its brand in this new, omni-channel environment? "Why should people shop at your store?" asks Starecheski. "Will it be the shopping experience, price, services offered, the assortment, the location, fulfillment options—or all of these—that will attract the digitally empowered consumer to that retail establishment?"

According to Hutchinson, Sears approaches these and other questions by using a simple mission: to serve, delight, and engage members while they shop their way. "The customer is in charge," says Hutchinson. He points to Sears' single pile of inventory, which gives customers access to inventory regardless of its location in the supply chain, its "always on" network, and the retailers final-mile solution—same-day delivery 6 or 7 days a week—as a few of the company's top omni-channel strategies to meet new, pressing consumer demands.

Going forward, Hutchinson says that the smartest retail supply chains will be those that transform from traditional hierarchical supply chains to omni-channel supply chains, invest in relevant technology platforms, and invest in talent. "Cross-functional skills and leadership are required," says Hutchinson. "Being in an industry that is rich in hard analytical skills is no longer sufficient."

3PL Management: Optimizing your 3PL relationship in an omni-channel world

The evolution of omni-channel fulfillment and the subsequent "digital supply network" that makes it all work often depends on just how well logistics operations and their third party logistics provider (3PL) partners can work together to take costs out of the system—while making improvements in flexibility and speed.

In this session, Barry Blake, vice president of research at SCM World, explains how shippers and their 3PLs can better partner to tie together talent, mobility, social media, analytics, Big Data, and physical locations into a real-time, digital supply network. The presentation is based on data collected from 20,000 SCM World members across three different surveys.

According to Blake, the omni-channel reality is a channel transformation that's occurring in industries where an explosion in demand volatility is driving everything from customer ordering patterns, order size, order frequency, attributes of the facilities and distribution networks, facility location, and facility automation. "It's also driving the shift in skill sets needed in 3PL partners and the logistics professionals that manage them," says Blake.

In one particular survey, the SCM World community was asked how the top six 3PLs fared with regards to reliability, speed, scale, value for money, and innovation. "The surprising results for all 3PLs was that they were all

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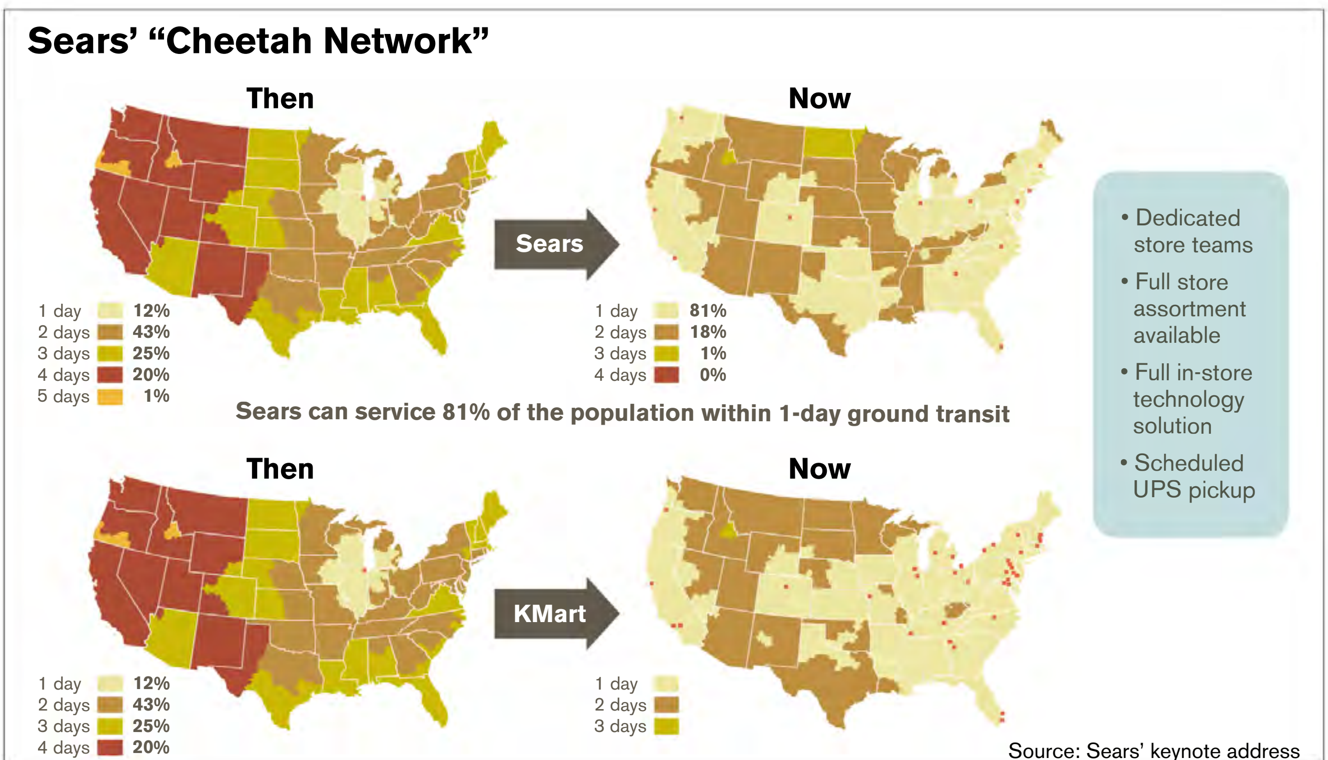

lacking in innovation," says Blake, who adds that primary skill sets for logistics professionals now involve the management of both information and relationships, and that "while good operators are important, they aren't nearly enough anymore."

Distribution: What does it take to be an omni-channel fulfillment DC?

The decision to use retail fulfillment or e-commerce distribution is no longer an either/or question. Driven by the need for flexibility, speed, and maximum uptime, shippers are turning to a new generation of technologies and innovative processes to handle and fill pallet, case, and single line orders.

In this session, Bryan Jensen, vice president and principal at St. Onge Company, highlights the strategies, technologies, and best practices leading companies are taking to move to omni-channel distribution. Jensen launches the session by explaining that there are several basic network types and configurations for servicing retail, wholesale, and direct-to-consumer customers, including:

- Combination Center: Stores, wholesale, and on-line customers serviced from the same facility.
- Dedicated Centers: Stores, wholesale, and on-line customers serviced from separate locations.
- Store Distributed: On-line customers are serviced from stores.
- Hybrid: Combination of the above strategies based on geography and SKU segment (type or velocity).

Jensen explains each of the three configurations, highlights how each works, and shows the pros and cons of each. Single fulfillment centers, for example, have the greatest concentration of volume to leverage both economies of scale and technology investment, for example, yet they generally result in longer cycle times to customers. And while multiple locations offer the advantage of lower cycle times, they also give shippers multiple inventories to manage.

Regardless of how an organization's DCs are configured, each must be equipped with the right balance of order entry and the proper warehouse management system (WMS). If, for example, the facility is to function for store replenishment, wholesale, and direct to consumer facility then the WMS must be able to support channels simultaneously and provide the necessary inventory visibility and positioning.

"The system must have an understanding of multiple-site inventory locations and inventory by locations," says Jenson. "This enhances multi-line ordering, enables multiple pick types for a single SKU, and opens up the potential for inventory-sharing among channels."

Technology: Creating the mobile supply chain

Driven by omni-channel retailing and the increasing demand for real-time supply chain visibility, the fully mobile supply chain is becoming a reality. As mobile devices and wireless functionality continue to penetrate our everyday lives, the same technologies are having

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considerable impact on the supply chain and are playing a vital role in omni-channel fulfillment.

In this presentation, David Krebs, executive vice president of mobile computer research firm VDC, takes a closer look at how operations can put mobility to work inside the four walls of the warehouse—and also within that vital area that stretches from the dock door to the end delivery point.

Krebs illustrates how mobile and wireless technologies are helping supply chains work smarter and faster in today's competitive business environment and gives attendees insight into how mobility can enable improved overall supply chain performance.

Krebs opens his session by explaining that omni-channel retailing and fulfillment are focused on a more seamless approach to the consumer experience through all available shopping channels—including mobile devices, computers, brick-and-mortar, television, radio, direct mail, and catalogue. "Mobile solutions untether us," says Krebs, noting that omni-channel is redefining warehouse and DC design with multiple channels supported by a common facility. "Mobile is also helping to support a shift towards a more agile customer engagement model."

Where traditional models measured total response time from order to retailer in days or weeks, today's modern models have narrowed those time frames down to hours or days. And while omni-channel mobile adoption is still in its early phases, Krebs says that the need for better customer service, order flexibility, inventory accuracy and visibility, and system integration are all driving the need for greater warehouse process efficiencies and flexibility.

"Mobility is only becoming more integrated with a variety of workflows providing greater end-to-end visibility," says Krebs. "The next generation warehouse platforms and infrastructure are evolving to more seamlessly support a greater variety of materials handling and mobile technologies."

Freight: Understanding "dimensional pricing"

The increase in freight volume due to logistics operations looking to improve service levels across all channels is pushing less-than-truckload (LTL) carriers away from the standard National Motor Freight Classifications rating system and over to a dimensional weight-based rate formula that sets the price based on package volume—the amount of space a package occupies in relation to its actual weight.

In this presentation, Peter Moore, a member of the program faculty at the University of Tennessee Center for Executive Education and adjunct professor at The University of South Carolina Beaufort, demystifies the shift to dim by explaining the details behind why it makes sense for carriers.

Moore also shares an example of a major shipper that successfully leveraged the new system by condensing product and packaging, and explains how shippers need to use this opportunity to open the dialog with their carriers and begin collaborating on multiple levels to optimize service and cost.

According to Moore, the real opportunity for shippers comes with tearing up the old tariff. "Now is the time to act," he says, noting that while the old, classification-based rating system uses "average for value," a simple, dimension-based tariff will average other cost factors.

To reduce carrier costs in the dimensional pricing environment, Moore says that shippers should focus on the following four strategies: Know the dimensions, weight, and value of your products; learn what factors you can control that affect carrier cost; investigate cloud-based exchanges that can handle complex rate structures; and open a new collaborative contract initiative with your best carriers.

Transportation: Importance of TMS in omni-channel fulfillment

The very foundation of successful omni-channel fulfillment is built on a well-managed transportation infrastructure that makes freight movement and deliveries through the various nodes of the supply chain as seamless as the consumer-facing technologies on which the orders are being placed.

In this session, Shanton Wilcox, vice president of supply chain management for Capgemini Consulting, focuses on the increasingly important role transportation management systems (TMS) play in helping both manufacturers and retailers reduce the cost and complexity of omni-channel transportation networks.

According to Wilcox, recent Capgemini survey data highlights the immaturity of omni-channel supply chains and the fact that 33 percent of companies currently have "no capacity" to handle omni-channel retailing. In assessing the key factors that are holding companies back on this front, he says that companies are having to add SKUs to meet diverse needs; manage less predictable and more frequent orders; and increase service offering variety—via same or next-day, bulk, and economy shipping, for example. Wilcox sees TMS as a critical facilitator for companies that want to overcome these and other omni-channel-related hurdles.

—Bridget McCrea is a Contributing Editor to SCMR

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Where's the Next China?

After a decade long offshoring boom, companies are seeking new destinations to optimize their gross profits and asking: Where's the next China?

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The last decade or so witnessed an offshoring boom. At the start of the boom, companies decided to outsource their operations internationally to low-cost countries in order to benefit from the economy of scale and scope offered by vendors, to mitigate technological risks and uncertainty, and to improve their focus on retained core competencies.

China became the first choice for international outsourcing of manufacturing. The country was propelled by the devaluation of its currency, a reduction of tariffs from its entrance into the World Trade Organization, generous tax incentives, cheap industrial land, and low labor rates. By becoming the "hot spot" for international manufacturing, China experienced an influx of foreign capital, which not only simulated its economic growth and development but also eroded its costs advantage over the years. China's increasingly urban population now has higher expectations in terms of wages and working conditions.

A study conducted by The Boston Consulting Group suggests that it is time to "reassess" China and estimates that for some products, the country's overall cost advantage could disappear in 2015. Additionally according to *The Economist*, as wage advantages disappear, firms are discovering the disadvantages of distance. The cost of shipping heavy goods halfway around the world has been rising sharply, and goods spend weeks in transit. The magazine also states that companies have found that manufacturing somewhere cheap and far away but keeping research and development at home can have a negative effect on innovation; a succession of wars and natural disasters in the past decade has highlighted the risk that long supply chains might become disrupted.

The result: Many companies expanding their global footprint today are seeking new destinations to optimize their gross profits. Some questions they are now asking include: Where's the next China? Where should we outsource our manufacturing to optimize gross profits? There are a few options companies could consider. They could outsource their operations in the inland of China, in Mexico, or in Vietnam. They might even reshore manufacturing domestically in the United States. We will review each of the options, assess strengths and weaknesses, and offer a solution to these issues.

Companies that would consider moving or manufacturing in the inland China will find lower wages. However, this option might not be attractive to many industries. Chinese cities in the interior of the provinces do not have an abundant pool of skilled labor, established supplier networks, or an efficient transportation infrastructure; these factors would offset much of the savings afforded by slightly lower labor costs.

Vietnam is developing rapidly and offers significant cost advantages, especially in terms of labor. However, the country is still acclimating to Western manufacturing methods and standards; therefore foreign companies will have to accept some tradeoffs and be vigilant

about quality. Vietnam is also often perceived as being part of a China Plus One strategy, in which firms maintain production in China but add operations in another Asian country to spread out risks and avoid supply chain disruptions. One important drawback is that Vietnam is experiencing skills shortages; many workers lack basic workforce readiness. Companies might have to invest in training to meet the production and quality standards of American consumers.

Mexico has the advantage of geography: A shared border with the United States and proximity to markets means that lead times are shorter; thanks to the North American Free Trade Agreement (NAFTA), goods imported from Mexico can enter duty-free. Additionally, the wages in Mexico are significantly lower than in China and the country has a skilled labor force. By some estimates, Mexico graduates some 115,000 engineering students per year. Unfortunately, the country's drug war and income disparity could deter foreign investment due to concerns about safety.

When the Boston Consulting Group conducted research about U.S. domestic outsourcing, it concluded that by around 2015, it might start to be more economical to manufacture goods in the U.S., leading to a potential renaissance of American manufacturing. U.S. federal, state, and local governments have increased incentives to outsource activities domestically. Companies would enjoy increasingly competitive U.S. labor costs and productivity, shorter lead times, a better synchronization of production with other business functions, and a greater ability to innovate. Currently, it is still more cost effective to manufacture in China, and many companies are still wary to come back in the United States because of investments they have already made overseas.

According to the consulting firm McKinsey, "companies continue to indulge in herd behavior" when deciding where to base their operations and how to arrange their supply chains. The consulting firm also states that many companies follow each other around to low-cost countries or are drawn by foreign government incentives.

So, where is the next China? Unfortunately, there is no one clear answer to that question, especially for companies looking for low wages. Rather than fixating on labor rates, companies should instead undertake a rigorous and product-by-product analysis of their global supply networks that takes into account the total cost of production. Firms should also think about proximity to the consumers they are planning to serve; doing so will allow them to earn a competitive advantage because companies would have to enhance their ability to customize their products to adapt to the new market trends. Being closer to the customers would be a way for companies to spur innovation, and quicken the delivery time. Firms that are looking to expand their production capacity to better respond to the customers' needs should also take into consideration the following factors:

- location (i.e. effective infrastructure of the country, cultural compatibility and differences);
- the availability of skilled labor;
- quality of products from primary suppliers and their suppliers;
- sustainability throughout the supply chain;
- the business environment (i.e. protection of intellectual property, sound business regulations, corporate taxes);
- political stability of the targeted country (i.e. war, level of corruption);
- the environment (whether the country is subject to regular natural disasters);
- and other factors such as lead time and transportation costs.

Like the expression goes, you shouldn't put all of your eggs in one basket and in this case you shouldn't put all of them in the same region.

It's clear that choosing the right location for producing a good or a service is not an exact science; it will vary from industry to industry. If a company is considering expanding its production capacity in a cost-effective way it should identify its targeted customers and analyze the total production costs. According to *The Economist*, firms are moving away from the model of manufacturing everything in one low-cost place to supply the rest of world. To distinguish themselves and earn a competitive advantage, firms should distribute their production more evenly and selectively by being closer to their main customers.

Like the expression goes, you shouldn't put all of your eggs in one basket and in this case you shouldn't put all of them in the same region. Most important, once a company decides that they should move part or all of the sourcing from China or any location for that matter, the implementation of that decision should be planned with a laser-like focus.

Big Data: Is the Energy Industry Starting to See Real Applications?

The oil and gas industry has always collected data, even if it was hard to access. With new systems and analytic tools, procurement can use Big Data to make smarter sourcing decisions that have a real impact in the field.

By Vivek Chidambaram, Hugo Evans, and Kristen Etheredge

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Imagine a scenario where a category manager could connect field valve, combustor, or artificial lift failure rates across a variety of operating environments to specific brands and models of equipment. Or imagine another scenario where a supply chain professional could more precisely predict necessary replacement parts usage by understanding the level of experience of the service crews maintaining the equipment. These are increasingly real applications of Big Data across the manufacturing space. Procurement organizations are at the nerve center of this data and have the ability to significantly impact operational performance, costs, and project performance metrics by using data that has historically been available but hard to access.

We will specifically explore the applications to the oil and gas industry (O&G) in this article, but these applications are relevant across multiple industries.

The oil and gas industry operates at the forefront of technology applied to exploration and production. High performance clusters, large reservoir models, seismic models, and large volumes of production data are regularly analyzed. Working with large data sets and advanced analytic modeling (Big Data), therefore, is not a new concept.

Traditionally, Big Data has centered on data sets with significant volume, variety, and velocity of data. However, recent advances have O&G executives in the industry struggling to play catch-up with industries such as financial, media, and consumer products. These are using a wide variety of unstructured data sources (video-, text-, and social media-based analytics) to generate differentiated competitive insights. They have quickly incorporated new analytic techniques to mine data and enhance their traditional analytics capability. Big Data analytics is not so much about the literal handling of large volumes of diverse data quickly, but rather implementing a program with the requisite mechanisms in place—execution requires expanded levels of cross-organization data access, insight generation through advanced analytics, and value creation by proactively identifying opportunities and resolving issues.[1] Adoption of a successful Big Data program involves more than just technology; it is a fundamental shift in skill sets (for the business and IT organizations) and a mandate from the C-level to create and foster a culture of analytics.

Fundamentally, the industry includes many specialized oil field service (OFS) providers, long project cycle times with high potential for cost escalations, disparate systems, and a varied range of sophistication among suppliers. This complex structure has led to data being captured across multiple suppliers or departments within the organization. Big Data advances have now enabled the industry to look at old data through a new prism—capturing existing data across disparate platforms and connecting it in a way that enables meaningful business decisions.

Similar to how the Internet brought a huge change to information accessibility, leveraging

existing data to predict future trends and support procurement decisions can fundamentally change how procurement organizations function within O&G companies.

Oil and Gas Industry Data

All O&G companies collect a wide variety of performance data; for example, in exploration and production (E&P) companies collect geologic and geophysical information and logs, supplier information, project data, sensor outputs, and human resource information. Processing this data in each of the operational silos allows individual organizations to continuously improve established measured metrics. For example, costs for services and equipment can be managed, service provider downtimes are monitored, and production deferment measurements are continuously improved. Consequently, areas are optimized individually, rather than collectively, which limits the overall value realized across the organization. True breakthroughs in performance can only be achieved by looking at interrelated activity across the value chain and analyzing implications.

Internal efforts to go across silos and consider total costs are often stymied by the nature of the data access—the data is housed in different systems or software, time cycles for project data are long, and paper and mixed format data are difficult to process. Recent technology advances have spurred increased capability and sophistication to identify correlations and bubble up insights that could not be identified at in the past, including:

- For the same specification, which pieces of similar equipment (for example, combustors or separators) result in higher operating cost? Which suppliers make them? What kind of operating impact does the equipment have over time?
- How should maintenance frequency be optimized across different shale fields with unique characteristics?
- What supplier interfaces and KPIs need to be improved?
- How does staffing and talent management affect project performance?

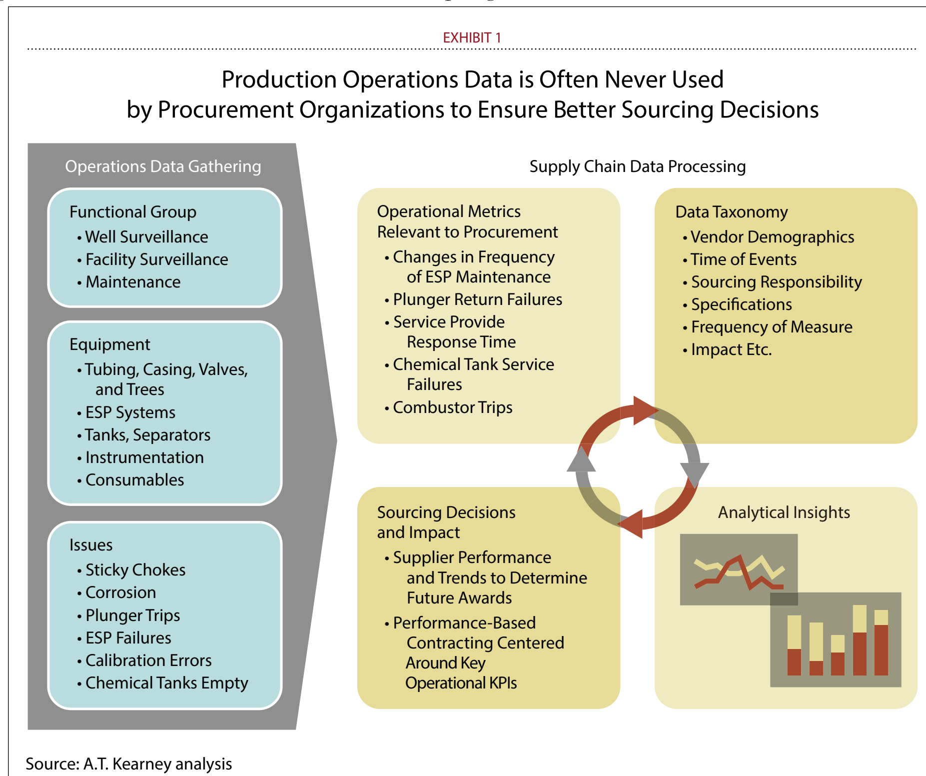
These types of questions yield Big Data applications that O&G companies are beginning to aggressively leverage. One such new domain is procurement.

Procurement Applications

A procurement organization's biggest challenge is an unhappy facilities engineer or field surveillance engineer who faces operational issues with equipment or services that were technically sourced per specifications. Operational issues, such as a combustor from a supplier that performs poorly for no apparent reason, a dehydrator tank that requires maintenance, valves that stick, or tubing and casing that corrodes too rapidly, cause a variety of performance difficulties at the field level for various procurement sourcing decisions. If operations data could be processed in a systematic fashion, it can be used to improve procurement performance and pinpoint specific quality improvements for equipment and services. However, procurement decisions rarely incorporate actual field data and performance for procured parts—this data exists, but the inherent life cycle of projects and the limitation of traditionally available Excel-based analytics often result in the information not being used. Without actual data and feedback on performance, the procurement team is not armed with critical total-cost-of-ownership-type input to make holistic equipment selection. The next set of productivity improvements in procurement are going to come by integrating operational data and adopting a data-driven mind set.

EXHIBIT 1

Production Operations Data is Often Never Used by Procurement Organizations to Ensure Better Sourcing Decisions



Source: A.T. Kearney analysis

Even when operations data is used, it is often used simply to optimize KPIs associated with well-known cost buckets such as installation and service costs. It rarely incorporates operator feedback and data on specific parts, suppliers, or equipment design. Leveraging Big Data concepts can help procurement teams gather more information quickly and collaborate with operational teams to make more informed procurement decisions across the equipment life cycle. This requires gathering data across disparate systems and diverse organizations. The next step is applying an appropriate hierarchy and taxonomy to identify relationships and trends across these data sets and functions. Creating the taxonomy and organizing the data requires three critical components: functional industry knowledge; deep operational expertise; and analytical and data expertise.

Leveraging data-driven decision making also captures and codifies legacy data in an industry that is facing a talent gap as experienced personnel retire. Incorporating Big Data analytics will not only improve ongoing operations, it can lay the organizational foundation to secure critical information and empower teams to make better decisions across the value chain.

An example of operational production data typically involves groups involved in surveillance (wells and facility) and maintenance (see Exhibit 1). Several equipment failure modes exist. Some are reservoir-driven and difficult to control, but others—such as correlating vendor demographics, event timing, and specifications to field performance—can be improved with procurement data analytics.

More often than not, systems and data experts lack the operational and functional knowledge to leverage data effectively. Combining systems and operational O&G expertise helps organize the data in a fashion to search for operational issues across a desired data taxonomy, develop the required analytical insights associated with specific parts or suppliers, and arm procurement organizations to make better sourcing decisions. Further, as a function, individuals within the procurement organization will need to become more conversant in the language of analytics. Talent development is a topic for a future paper, but it is important to note that people should be comfortable with basic analytic concepts so that they can be directly involved with the development and dissemination of analytic insights.

Conclusion

As an industry, O&G inherently knows how to handle large masses of data; however, expanding that competency to improve the velocity and depth of analytical insights will bring a significant competitive advantage. Making advanced data applications in procurement involves breaking down silos, developing taxonomies, studying correlations, and visualizing the findings to unleash the power of data-driven insights. Typically, IT and systems personnel do not have the industry knowledge and expertise to make sense of vast data, while those with industry expertise do not typically have functional analytics skills; however, combining the analytics capability with industry expertise becomes a powerful combination.

Leveraging data-driven decision making also captures and codifies legacy data in an industry that is facing a talent gap as experienced personnel retire. Incorporating Big Data analytics will not only improve ongoing operations, it can lay the organizational foundation to secure critical information and empower teams to make better decisions across the value chain. Ultimately, a comprehensive Big Data program will enable procurement organizations to engage in activities such as being able to connect operational issues and corrective actions with individual suppliers to create a 360-degree view of supplier performance.

1 Advanced analytics refers to sophisticated techniques that include statistical modeling, predictive analytics, text mining/analytics, simulation, optimization, and visualization.

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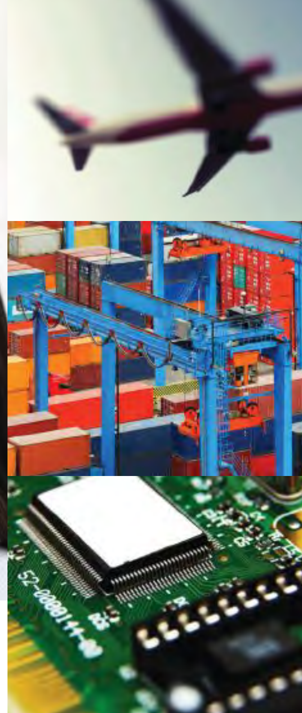

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EXECUTIVE EDUCATION SUPPLEMENT
SUPPLYCHAIN MANAGEMENT REVIEW

5 Ways to Fill Supply Chain Knowledge Gaps

Tim Engstrom
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EXECUTIVE EDUCATION

5 Ways to Fill Supply Chain Knowledge Gaps

By Bridget McCrea

Is your organization suffering from supply chain knowledge and skillset gaps? Here are five strategies to get back on track.

As the world's largest chemical company, BASF's operations span 80 countries, six integrated production sites, and 390 other production facilities in Europe, Asia, Australia, Africa, and the Americas. Domestically headquartered in Florham Park, N.J., the company faces some unique challenges when it comes to keeping its supply chain managers and employees around the globe well informed and up to speed with the latest knowledge and information.

"As the company has expanded, that proposition has become exponentially more difficult," says Dirk Hopmann, BASF's vice president of supply chain strategy. Establishing common supply chain nomenclature across BASF's operations, for example, and particularly in light of the firm's many recent acquisitions of other entities, has been especially challenging. To address that obstacle, the global manufacturer puts its new and existing employees through APICS' certification process – starting with BASF's supply chain managers.

"We know that management is the key driver of supply chain knowledge and skill sets, so everyone from the supply chain manager all the way up to our divisional presidents are certified," says Hopmann. "We push the APICS courses out as prerequisites for development in our supply chain division." In addition, he says supply chain sales professionals also use the course as a "key ingredient" of their training programs.

Going a step further, Hopmann says BASF has also used the certification courses with its business partners, particularly for orchestrating sales and operation planning processes. "Our goal is to help everyone understand the broad, end-to-end process that we're handling here," says Hopmann, "and all of the nomenclature and definitions associating with marketing, sales, and supply chain." To work toward that goal, BASF reinforces its training by recognizing and celebrating employees that achieve certification. "Division presidents hand over the certificates to the students, who, in turn, feel very positive about the experience," says Hopmann.

In addition to the nomenclature knowledge gaps that it's trying to fill, Hopmann says BASF also wrestles with the notion that not everyone understands why they are doing what they're doing. "We want to make sure everyone is on the same page when we talk about audit cash, demand planning, and S&OP," says Hopmann, "whether the employees are working here in the U.S., in Brazil, or in India." And because getting face-to-face with remote employees isn't always feasible, he says APICS' online coursework helps fill in the gaps nicely.

"We like the first, basic training to happen live, but then continuous training

takes place mostly online," says Hopmann, whose team utilizes video-conferencing and Webex-type platforms to administer the training. The setup has proven especially beneficial over the last five years as BASF has expanded globally. "We have global processes, regulations, and supply to manage around the world now. Having a single source of knowledge and certification at our avail ensures that everyone is speaking to one another in the same supply chain language."

Tackling Supply Chain-Specific Challenges

As companies like BASF have come to realize, gaps in the supply chain talent pool are both prevalent and pervasive. Whether they are keeping current workers up to speed, introducing new supply chain professionals to the mix, or a little bit of both, today's organizations are taking the steps necessary to make sure there are no critical gaps in those workers' supply chain knowledge.

Panos Kouvelis, professor of operations and manufacturing management at Washington University in St. Louis' Olin Business School, says supply chain knowledge gaps present key challenges for many companies. The fact that the discipline itself is "fairly new" contributes to the challenge. "Companies have always had inventory analytics and material procurement professionals," Kouvelis points out. "And while a lot of people moved up through organizations via these positions, most of them don't have the required skills for supply chain management."

So what's so different about supply chain management? According to Kouvelis, it's a discipline that requires the individual to have cross-functional perspectives on operations, marketing, sales, and finance, among other components. "A supply chain manager has to be able to assess the entire organizational system," says Kouvelis, "and then effectively interact with suppliers, distributors, and end users to figure out how to best integrate information, materials, and finance."

Here are five different ways that organizations are tackling that challenge and filling in the open gaps that exist within their supply chain talent pools:

1. **Executive Supply Chain Education.** It takes on different forms, all of them aimed at a similar goal: to bring existing employees and/or new graduates up to speed on the fine points of managing today's complex supply chain. According to Kouvelis, executive education is targeted mainly at younger candidates that already have graduate degrees in other fields (business, economics, engineering, or math, for example). "Most have strong analytical backgrounds and are now interested in studying supply chains," says Kouvelis, "and developing the skills needed to plan and manage such systems." Executive education generally requires a 12- to 24-month time commitment, depending on the school and the course format. Portland State University in Portland, Ore., for example, offers a 2-year, part-time online Masters of Science in Global Supply Chain degree. Cliff Allen, the program's academic director, says the program covers all of the steps in the sourcing and logistics process – "from the product's initial concept to its end-of-life."

2. **Supply Chain Certifications.** Through the professional certification process, individuals gain knowledge, experience, and skills to perform a specific job. When the coursework is completed the student must earn a passing grade on an exam that is accredited by an association or organization that oversees and upholds the standards for the industry in question. Course length varies according to the offering organization and in most cases the instruction is either self-directed or instructor-facilitated. Abe Eshkenazi, CEO at Chicago-based APICS, says certification helps companies fill in some of the newer gaps that are surfacing in supply chain knowledge, such as big data and analytics. He says companies want real-world experience in such areas, yet the typical college education doesn't necessarily address these newer points. "In many cases, a certification program can help differentiate the individual in the marketplace," says Eshkenazi. Tom Derry, CEO of the Institute for Supply Management (ISM) in Tempe, Ariz., says certification helps address a broad range of supply chain skillset gaps for everyone from entry-level employees to department heads. "Through the certification process, companies can effectively identify the skills that are lacking and then hone their training around closing those gaps," says Derry, who sees general business acumen and analytics as two areas that companies want to see their supply chain managers handle better. "Employees need a broader understanding of their businesses beyond just the mastery of technical foundations," says Derry, "and then relate their individual value to the company's overall strategy and success."

3. **Peer-to-peer mentoring and cross-generational collaboration**. In some cases, enhancing supply chain knowledge is a task that can be handled within the organization, where a goldmine of knowledge and hands-on experience lies within the existing workforce. "With the Baby Boomers heading into retirement, and with a high number of supply chain

job positions to fill, we definitely need to be mentoring younger folks and driving leadership within supply chain positions," says Lisa Angell, department chair and instructor of supply chain management at Fox Valley Technical College in Appleton, Wis. Angell says mentoring and cross-generational collaborations can help new employees gain the knowledge and skillsets they need to succeed in their positions while also assisting older workers with concepts and technology that they may not be familiar with. "Put Baby Boomers, Generation Xers, and Millennials together and not only will they understand one another better," says Angell, "but the process will also open everyone's eyes to new ways of doing things."

4. **Cross training and job rotation.** Sometimes all of the education and certifications in the world can't replace the hands-on experience that supply chain professionals gain from cross training on different jobs. "It gives individuals different perspectives on the supply chain," says Eshkenazi. "If you truly expect someone to grasp all aspects of the supply chain and your organization, then you must give them job rotation activities to participate in." A warehouse manager, for example, would benefit greatly from understanding how the procurement, production, and marketing departments operate, what are those departments' core goals, and what strategies they use to achieve those goals. "Go beyond finance and supply chain," says Eshkenazi, "and introduce your supply chain employees to all aspects of the organization."

5. **Partnering with universities and colleges.** When developing coursework for its supply chain programs, Portland State University reaches out to area organizations to find out what skills and knowledge would help them operate more efficiently in today's business world. "We've built out our curriculum around those needs," says Allen, who advises shippers to use a similar approach to partnering with their own local universities and/or colleges. By working with a business school, for example, companies can help establish programs that fill real-world needs. "Today's higher-ed world is very competitive," says Allen, "and we're all looking for ways to better engage our local communities and organizations."

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Boeing Center for Technology, Information, and Manufacturing (BCTIM)

BCTIM fosters interactions between industry and academia on issues relating to supply chain, operations, innovation, and real-time impacts on internal and external organizational management. Together with Boeing and other member companies, BCTIM advances best practices to optimize firms' global enterprise process. Team-managed, faculty-led, and company-developed projects produce tools that enhance supply chain agility, efficiency, and sustainability.

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olin.wustl.edu/seminars

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—Panos Kouvelis, PhD
Director of The Boeing Center for Technology, Information, and Manufacturing and Emerson Distinguished Professor of Operations and Manufacturing Management

UNIVERSITIES AND EDUCATIONAL INSTITUTIONS

Arizona State University

W.P. Carey School of Business
480-965-2100
wpcarey.asu.edu/

To propel your supply chain career, you need to learn the latest developments, the common language, and the best solutions to supply chain challenges. Taught by faculty experts in the highly ranked Department of Supply Chain Management at the W. P. Carey School of Business, the online supply chain management certificate will hone your skills and prepare you for the road ahead. The online certificate program, created to provide a graduate-level understanding of the supply chain, consists of five courses designed for:

- Professionals with at least 2–3 years of supply chain experience who want to broaden their expertise
- Seasoned supply chain leaders looking to capitalize on current best practices

Auburn University

334-844-4835
www.auburn.edu

Auburn's Raymond J. Harbert College of Business offers the supply chain management major, which equips students to handle the complexity of the flow of goods across the global marketplace by combining logistics and operations management training and provides a practical understanding of procurement, operations, and logistics.

Brigham Young University

801-422-5367
Marriott School
marriottschool.byu.edu

The supply chain consists of all the steps which lead to the production of goods and services, including suppliers and distribution channels. Supply Chain managers optimize all the steps so that the right amount of the right goods and services are delivered to customers at the right time. Effective managers must coordinate the links of the supply chain so as to maintain quality and customer satisfaction, while at the same time keeping costs under control. Students considering a career in supply chain management should have the ability to see the big picture of production, have good analytical skills, and be detail oriented. They must also be able to work in teams and have effective written and verbal communication skills.

Cranfield University

School of Management
+44 (0)1234 751122
www.cranfieldmsc.biz/log

Established over 26 years ago, the University offers one-year full-time Master's in Logistics and Supply Chain Management. It is widely recognized as one of the top Logistics courses in the world. Whether you are already a professional in this field or are looking to move into this area, this course provides you with the specialist knowledge and skills to further your career in supply chain management.

Georgia Institute of Technology

Executive Master's in International Logistics and Supply Chain Strategy
404-894-3808
www.emil.gatech.edu/

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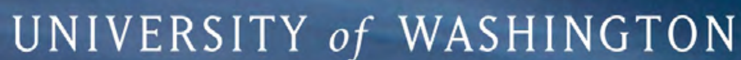
Golden Gate University

Edward S. Ageno School of Business
415-442-6500
www.ggu.edu

The graduate Global Supply Chain Management (GSCM) Certificate provides the theories and practices to be successful in this critical area of modern business. Students take two core operations management (OP) courses, two elective OP courses, and two other elective courses, as approved by the program director for a total of 18 units. The two core OP courses cover key strategic, design, tactical, and execution management knowledge. The two elective OP courses allow students to tailor their certificate in GSCM. The two other elective courses allow students to broaden their knowledge either in GSCM or in related areas such as marketing, finance, technology, project management and international business.



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SUPPLY-CHAIN-TRANSPORTATION.UW.EDU

W

Illinois Institute of Technology

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

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

Indiana University

Kelley School of Business
812-855-8100
www.kd.iu.edu

For master's level students interested in global supply chain management, Kelley's Department of Operations and Decision Technologies has many options.
Master's degree students in the department can pursue one of these majors:

- Master of Business Administration (MBA) in Supply Chain and Operations
- Master of Science in Global Supply Chain Management (MSGSCM), designed for the working professional and offered online)

Loyola University Chicago

Supply and Value Chain Center
312.915.6574
jcaltag@luc.edu
www.luc.edu/quinlan/scm

The Supply and Value Chain Center (SVCC) of Loyola University Chicago's Quinlan School of Business was instituted in 2013 for the purpose of acting as an intermediary between academic research and industry practice. The Center's work is a result of the collaboration of academic research, professional organization benchmarking, insight of industry leaders, and the inquisitive minds of the students of Loyola University Chicago. Workshops scheduled are:

- April 16, 2015 - The Lean Supply Chain
- June 25, 2015 - Total Cost of Ownership
- August 20, 2015 - The Value Stream and Integrated Solutions
- October 20, 2015 - The Fourth Annual Chicago Supply Chain Summit

Massachusetts Institute of Technology (MIT)

Center for Transportation and Logistics
617-253-5320
ctl.mit.edu/

In a volatile global marketplace, the largest and most influential organizations must depend on the strength of their supply chain strategies. At the MIT Center for Transportation & Logistics, these organizations can rely on the latest supply chain research that emerges from the intersecting front lines of technology and business.
Events scheduled are:

- Supply Chain Management: Driving Strategic Advantage —January 6, 2015 starting at 10:00AM EST to January 9, 2015 ending at 2:30PM EST. Held at MIT CTL Headquarters, 1 Amherst St., Building E40- Room 394,Cambridge, Massachusetts

Michigan State University

Broad College of Business
517-353-6381
www.bus.msu.edu/supplychain/

Firms are interested in individuals who have sound business skills, decision-making capabilities and a solid understanding of the latest technology applications. In Supply Chain the search widens for professionals who understand business alignment and value creation, who are aware of social and environmental responsibility and who value risk management. MSU Supply Chain graduates understand real-world strategies and have been taught the tactics employed by leading practitioners around the world.

North Carolina State University

Poole College of Management
919-513-7100
www.mgt.ncsu.edu

The Master of Supply Chain Engineering and Management program is designed to develop professionals who are familiar with the quantitative tools employed in supply chain analysis and planning, and who are capable of interfacing effectively with both business and technical professionals. Qualified candidates will have earned, by the program enrollment date, an undergraduate degree in engineering, or in a related discipline that requires a strong mathematics background. They will also express a clear desire to pursue a career in supply chain management, operations or logistics.

Northeastern University

D'Amore-McKim School of Business
617-373-3282
www.damore-mckim.northeastern.edu/

The Supply Chain Management program benefits include:

- Develop an integrative management approach critical in supporting supply chain cost and service improvements.
- Learn how different supply chain practices, strategies, and decisions can converge to tackle domestic and global supply chain challenges.
- Acquire an understanding of contemporary challenges, international trade, and development issues that affect the design of international supply chain systems.
- Gain valuable insights from professors who are thought leaders in the field.
- Apply the course credits acquired through the Certificate toward the Online MBA, pending admittance into the program

Northwestern University

Kellogg School of Management
847-467-6018
www.kellogg.northwestern.edu/execed

Create opportunities for revolutionizing your operations through increased efficiencies in the design and management of your supply chain. In this program, faculty present state-of-the-art models and practical tools for supply chain management and multi-plant coordination. You will learn effective logistics strategies for companies operating complex networks and be inspired to integrate supply chain components into a coordinated system to increase service levels and to reduce costs. The effective management of facilities, inventories, transportation, information, outsourcing and strategic partnering to improve operational performance are presented with real-world case studies. Each participant receives the book, Supply Chain Management: Strategy, Planning, and Operation.

Upcoming Sessions scheduled:

- March 1-4, 2015
- June 9-12, 2015

The Ohio State University

Fisher College of Business
614-292-0331
fisher.osu.edu/centers/scm/executive-education

The Supply Chain Management Program will focus on how to implement The Global Supply Chain Forum framework. The framework is comprised of eight essential cross-functional, cross-firm business processes. Examples are provided on how they have been implemented by major corporations. The seminar listed is designed specifically for executives who are striving to achieve cross-functional integration within their organization and with key customers and suppliers:

- May 19-22, 2015 – Ponte Vedra Beach, Florida
- Sept. 15-18, 2015 - Columbus, Ohio

Penn State University

Smeal College of Business
814-865-3435
www.smeal.psu.edu/psep

Smeal offers highly regarded supply chain programs at every educational level. For undergraduates, the college offers a bachelor's degree in Supply Chain and Information Systems. At the graduate level, the Smeal MBA Program offers a concentration in supply chain management and, together with Penn State World Campus, Smeal offers an online, 30-credit professional master's program in supply chain management. The college also offers a Ph.D. in supply chain, and Smeal's Center for Supply Chain Research and Penn State Executive Programs offer three certificate programs in supply chain management. Upcoming events for 2015 at the Executive Center, University Park Campus:

- March 3 – Developing Strategic Supply Chain Leaders
- March 24- Achieving Supply Chain Transformation
- April 21- Processes and Tools for Supply Chain Success
- April 28- Essentials of Supply Chain Management
- May 5- Aligning Supply Chain Organizations
- June 11- Introduction to Supply Chain Analytics

Rutgers University

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

The Supply Chain Management major is designed to help students master a variety of the latest supply chain and technologies. Upon graduation, graduates will have the ability to re-engineer the business processes involving multiple firms and different functional departments to achieve a higher level of business performance and profitability.
Sample Courses:

- Global Procurement and Sourcing Strategies,
- Business Logistics and Transportation
- New Product Planning
- Supply Chain Environmental Management/Green Purchasing

Stanford University

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

Information and ideas. Logistics and relationships. It's the powerful mix of these interdependent flows that drives supply chain excellence. Strategies and Leadership in Supply Chains course is taught by supply chain pioneers and thought leaders, including the founder of AAA and Bull Whip theories, Strategies and Leadership in Supply Chains focuses on the innovative ways in which organizations can leverage the supply chain to create and capture value.

Syracuse University

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

Supply chain managers very often hold the key to corporate profitability. Economists and employers single out supply chain management for its strong growth potential. Home to the nation's first supply chain program (established in 1919), the school's Supply Chain Management program is well attuned to the needs of this dynamic specialty. Whitman offers an undergraduate degree program and an MBA degree program in Supply Chain Management.

Texas A&M University

Mays Business School
979-845-1216
www.business.tamu.edu

Supply Chain Management (SCM) includes all the activities that must take place to get the right product into the right consumer's hands in the right quantity and at the right time – from raw materials extraction to consumer purchase. SCM focuses on planning and forecasting, purchasing, product assembly, moving, storage, distribution, sales and customer service. SCM professionals are involved in every facet of the business process as they strive to achieve a sustainable competitive advantage by building and delivering products better, faster, and cheaper.

The World Academy

855-496-8394
www.theworldacademy.com

The Academy provides training programs and seminars for organizations in all phases of export/import logistics, hazardous materials (HAZMAT), letters of credit, communications, harmonized tariff schedules, and INCO terms. A full list of webinars and workshops can be found on the Academy's website.

University of Arkansas

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

The Supply Chain Management Research Center links students, faculty and industry to develop tomorrow's supply chain leaders. We offer programs and opportunities for collaboration in a neutral setting where academics and industry can come together to influence the field of supply chain management. Thanks to our corporate partners, these are exciting times of growth and advancement for supply chain management at the University of Arkansas. Join us as we influence the future of the profession in academia and industry.

Upcoming event:
SCMRC Annual Conference- Wednesday, April 22, 2015- 8:00 A.M. to 4:00 P.M. CST

University of Denver

Daniels College of Business
303-871-3416
daniels.du.edu/

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

University of Maryland

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

Whether you're a recent graduate with an interest in how goods move around the globe, or a manager who would like to broaden your understanding of the global supply chain, the Smith MSB in Supply Chain Management will help you develop strong managerial skills and make connections with supply chain executives from a cross-section of industries. You'll be prepared to lead innovation that drives business growth, promotes efficiency, and helps sustain the planet - and gain the relevant, real-world experience most sought after by recruiters.

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University of Michigan

Ross School of Business
734-763-1396
execed.bus.umich.edu/

Students in our Ross School's Master of Supply Chain Management Program (MSCM), learn from Ross' world-renowned faculty in operations and management science, as well as top-ranked researchers in all business disciplines. MSCM students are admitted to the Tauber Institute for Global Operations, a partnership between the Ross School and U-M's College of Engineering.

University of San Diego

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

The Supply Chain Management Institute (SCMI) supports the development of exceptional professionals who are sought after by industry and the public sector alike. In addition to supporting the educational opportunities and curriculum of the Master of Science in Supply Chain Management (SCM), the MBA concentration in SCM, and the undergraduate BBA minor in SCM, we offer various symposiums, forums, and seminars for supply chain professionals throughout the year.

University of San Francisco

415-422-5555
www.usanfranonline.com/ism

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

University of Tennessee

College of Business Administration
865-974-5001
supplychain.utk.edu

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

University of Washington

Department of Civil & Environmental Engineering
206-221-6407
www.supply-chain-transportation.uw.edu

The University of Washington online Master of Supply Chain Transportation and Logistics (SCTL) program prepares you to take a leadership role in the end-to-end management of transportation in a global supply chain, an increasingly critical capability for companies that want to prosper in today's world of heightened international competition. The program is a part-time, online degree program designed for working professionals. Courses are delivered over the Web using interactive technologies that facilitate collaboration and interaction. There is a one-week, on-site course held on the UW campus at the start of the program. Enroll in this program and gain a comprehensive understanding not just of transportation systems, but also of how these systems function in the larger context of a complex global supply chain ecosystem.

University of Wisconsin-Madison

Grainger Center
608-262-1550
bus.wisc.edu/centers/grainger-center-for-supply-chain-management

The Wisconsin MBA in Supply Chain Management, supported by the Grainger Center for Supply Chain Management, provides students with a personalized, industry-focused program which partners with companies known for supply chain excellence. We provide students with an exceptional interdisciplinary education that builds on fundamental knowledge and incorporates the latest in supply chain thinking. The strategic, cross-functional curriculum takes an integrated business process view of supply chains, including marketing, sourcing, logistics, operations, and customer service. Students connect with and learn from real-world supply chain leaders and are part of a strong, close-knit community.

Walden University

1-866-492-5336
www.waldenu.edu

Whether you are a manufacturer, retailer, or service provider, if you conduct business globally, you need to understand how products and services move from concept to deliverable. Learn the systems required to identify sources of personnel and material

and how to ensure that supply chains conform to the highest global standards. In addition, you will explore new ways of applying technology to help cut costs, increase customer satisfaction, and find new business opportunities. Coursework focuses on the development of writing and critical-thinking skills at the doctoral level.

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Olin School of Business
314-935-9494
www.olin.wustl.edu/EN-US/Pages/default.aspx

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Session dates: April 27 through May 1, 2015

PROFESSIONAL ASSOCIATIONS

APICS

1-800-444-2742
www.apics.org

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

CSCMP (Council of Supply Chain Management Professionals)

630-574-0985
cscmp.org/

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

ISM (Institute for Supply Management)

480-752-6276
www.ism.ws/

ISM offers certification programs, seminars, professional development services, and online courses for the supply management professional. It also features an annual Conference and Educational Exhibit. Conference events:

- ISM Annual Supply Chain Diversity Summit- February 18 - 20, 2015- Atlanta, Georgia

NITL (National Industrial Transportation League)

703-524-5011
www.nitl.org/

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

SIG (The Original Executive Sourcing Network)

904-310-9560
www.sig.org

SIG is acknowledged by many as a world leader in providing "next" practices, innovation, and networking opportunities through its: global and regional events, online webinars and teleconferences, member peer connection services, content-rich website, and online Resource Center, which was developed by and for professionals in sourcing and outsourcing. The organization is unique in that it blends practitioners, service providers, and advisory firms in a non-commercial environment.
Events planned include:

- Global Summit – March 10 -12, 2015 – Amelia Island, Florida

Supply Chain Council
202-962-0440
supply-chain.org

Supply Chain Council (SCC) is a global nonprofit organization whose framework, improvement methodology, training, certification, and benchmarking tools help member organizations make dramatic, rapid, and sustainable improvements in supply chain performance. Events, conferences, and training calendars are available on our website.

TRB (Transportation Research Board)
202-334-2934
www.trb.org

Transportation practitioners, researchers, public officials, and other professionals need credible, high-quality information and research results to address the transportation challenges of the 21st century. The Transportation Research Board engages professionals worldwide in a broad range of interdisciplinary, multimodal activities to lay the foundation for innovative transportation solutions.

VICS (merged with GS1 US)
609- 620-0200
www.vics.org

The apparel and general merchandise industries are most concerned with improving inventory accuracy and speed-to-market capabilities to satisfy consumer demands, while still addressing requirements around business process efficiencies and product safety. Learn more about the GS1 US Apparel and General Merchandise Initiative and the EPC Item Level Readiness Program that can help your organization benefit from adopting GS1 Standards.

WERC (Warehousing Education & Research Council)
630-990-0001
www.werc.org

WERC offers resources that help distribution professionals stay at the leading edge including educational events, performance metrics for benchmarking, practical research, expert insights, and peer-to-peer knowledge exchange. WERC members are from companies across the gamut whose focus is on warehousing and distribution.

PRIVATE FIRMS

Accenture Academy
312-842-5012
www.supplychainacademy.com

The Accenture Academy supply chain curriculum offers hundreds of courses covering supply chain fundamentals, product innovation and lifecycle management, supply chain planning, sourcing and procurement, manufacturing, logistics, and customer and service management. We integrate these supply chain-specific courses with the specialty skills and broader business management capabilities needed to help the supply chain workforce become more versatile business professionals. Accenture Academy also supports industry certifications provided by leading professional societies.

Vantage Partners
888-547-8852
www.vantagepartners.com

At Vantage Partners, we advise chief procurement officers, lead supply chain transformation initiatives, support development of category strategies, design and implement supplier relationship management programs, advise on high-stakes supplier negotiations, and provide a range of training solutions to procurement leaders and professionals.

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FEATURES

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2014 marks the 10-year anniversary of the Gartner Supply Chain Top 25 ranking. There are lessons to be learned from these supply chain leaders, many of whom have led their industries over the past decade.

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Intel has long had superlative internal supply chain processes within its vertically integrated operations. But until recently, the same could not be said of the work that it outsources to subcontractors around the world. Here's how a determined team championed a powerful supply chain collaboration model that is getting real results.

26 Warehouse Control in the Age of the Internet of Things
In the age of the Internet of Things, an increasing number of materials handling systems are gaining both sensors and intelligence. If warehouses and distribution centers are to utilize these new technologies to optimize performance, we need a new conception of the software systems that control them.

30 Packaging: Think Inside and Outside the Box
Packaging has traditionally been disconnected from the rest of the supply chain. With the growth of e-commerce, smaller and more frequent deliveries, and proposed changes in shipping charges, packaging may be the next frontier in supply chain optimization.

40 Change the Incentives, Engage the Whole Organization
In most organizations, the goal of maximizing profits is clear—it's what's done and rewarded, it's what's stated, and it's what most executives believe. But when it comes to environmental or social performance, there's a breakdown. Andrew Winston, author of *The Big Pivot*, offers new ways for supply chain managers to put in place specific incentives that drive greener operations, longer-term thinking, and different priorities.

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Supply Chain Management Review® (ISSN 1521-9747) is published 7 times per year (Jan/Feb, Mar/Apr, May/Jun, July/Aug, Sept/Oct, Nov, Dec) by Peerless Media LLC, a Division of EH Publishing, Inc., 111 Speen St, Ste 200, Framingham, MA 01701. Annual subscription rates: USA $199, Canada $199, Other International $241. Single copies are available for $60.00. Send all subscription inquiries to Supply Chain Management Review, 111 Speen Street, Suite 200, Framingham, MA 01701 USA. Periodicals postage paid at Framingham, MA and additional mailing offices. **POSTMASTER: Send address changes to: Supply Chain Management Review, PO Box 1496 Framingham MA 01701-1496.** Reproduction of this magazine in whole or part without written permission of the publisher is prohibited. All rights reserved. ©2014 Peerless Media LLC.

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FROM REDEFINING SUPPLY CHAIN MANAGEMENT

TO GAINING THE COMPETITIVE ADVANTAGE

The Global Supply Chain Forum at The Ohio State University Fisher College of Business has been helping top companies around the world drive profits for almost two decades.

We have worked with leading-edge companies to redefine supply chain management and develop **the framework for success**.

- **Integrated**
  SCM is cross functional and cross firm.

- **Relationships and Key Business Processes**
  Customer relationship management & supplier relationship management form the critical links in a supply chain.

  Coordinated through these links are: customer service management, demand management, order fulfillment, manufacturing flow management, product development and commercialization, returns management—all forming the framework for long-term success.

Want to learn more about this framework for success and how to implement it? Enroll now in one of our upcoming seminars:

May 19-22, 2015 in Ponte Vedra Beach, Florida
September 15-18, 2015 in Columbus, Ohio

Visit **go.osu.edu/gscf-scm15** today—and start defining your SCM future.

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