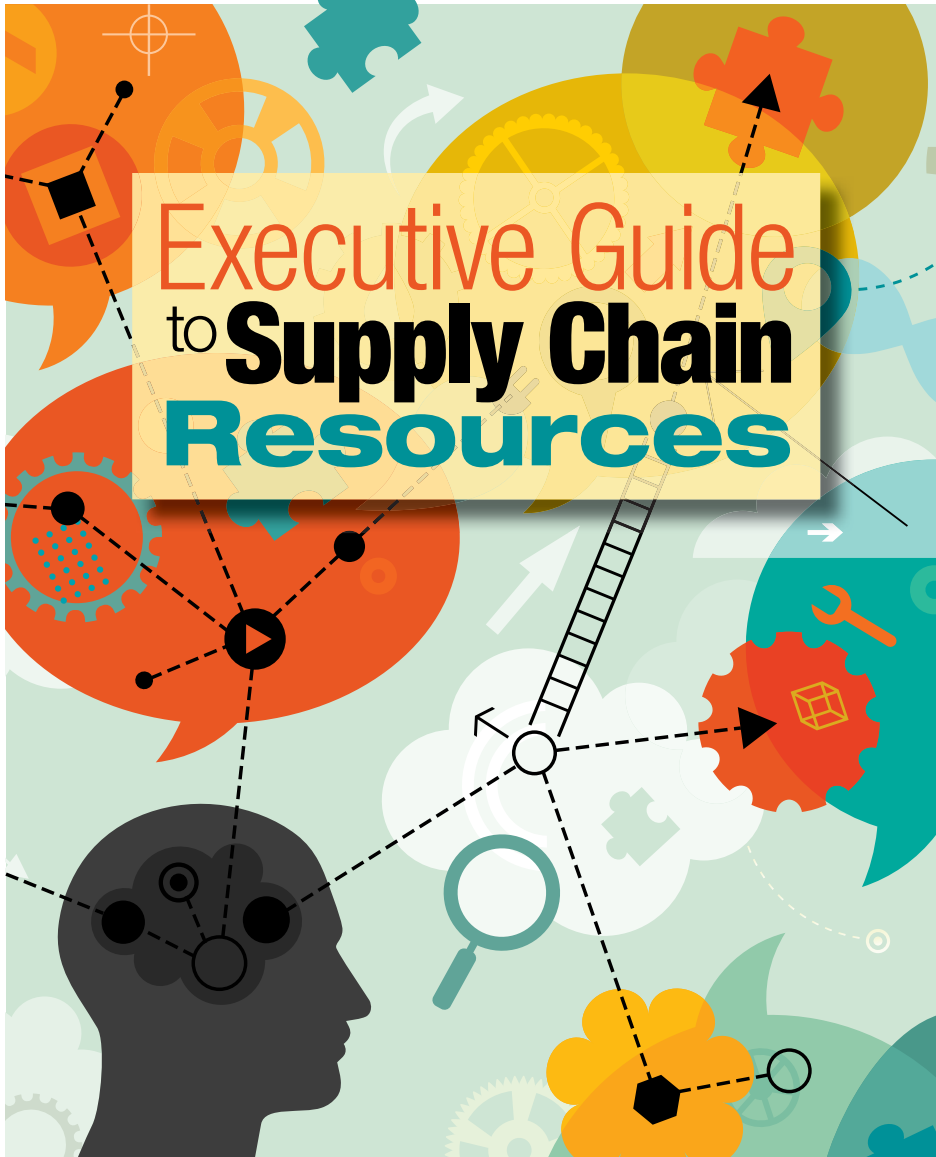


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A resource for the year ahead

It's December and time once again for our annual Executive Guide to Supply Chain Resources. This is a comprehensive guide to services, products and educational opportunities targeted specifically to supply chain professionals. As with years past, we're also featuring several articles we trust will offer food for thought in your supply chain throughout the coming year.

First up is executive editor Patrick Burnson's annual outlook for the economy and supply chain management in the year ahead. Burnson surveys a wide variety of published reports and brings them together in one concise outlook feature. As a complement to this outlook, for the first time, we're running insights from the Council of Supply Chain Management Professionals' 2017 State of Logistics Report authored by A.T. Kearney. The authors identify four scenarios that have the potential to significantly affect profitability, and even the future viability of some logistics sectors. And, they walk through the major trends they believe will have an impact on logistics in the coming year. Together, they're a good reference point for any supply chain professional planning for 2018.

We're rounding out the issue by republishing two articles on the future of supply chain management and supply chain managers from Steven A. Melnyk. These are the first two articles in a series *Supply Chain Management Review* will be publishing over the next year or two. In the first, Melnyk, a frequent contributor to *SCMR*, looks at how the "new" supply chain requires a "new" breed of supply chain manager. In the second, he looks at how customer service requirements—rather than cost reduction—is the most important driver of the supply chain of the future.

Additionally, I hope you'll glean insights from the column on last mile delivery by David Widdifield.

The editors at *Supply Chain Management Review* wish all of our readers a successful year to come. We hope that the information and insights contained in this issue will play some part in that success.



Bob Trebilcock,
Editorial Director
 btrebilcock@
 peerlessmedia.com

Bob Trebilcock

SUPPLYCHAIN MANAGEMENT REVIEW

EDITORIAL OFFICES
 111 SPEEN ST., SUITE 200
 FRAMINGHAM, MA 01701-2000
 1-800-375-8015

Bob Trebilcock
 EDITORIAL DIRECTOR
 btrebilcock@peerlessmedia.com

Frank Quinn
 EDITORIAL ADVISOR

Patrick Burnson
 EXECUTIVE EDITOR
 pburnson@peerlessmedia.com

Sarah Petrie
 EXECUTIVE MANAGING EDITOR
 spetrie@peerlessmedia.com

Chris Lewis
 CREATIVE DIRECTOR
 clewis@peerlessmedia.com

Wendy DelCampo
 ART DIRECTOR
 wdelcampo@peerlessmedia.com

Gary Forger
 SPECIAL PROJECTS EDITOR
 grforger@gmail.com

Jeff Berman
 ONLINE NEWS EDITOR
 jberman@peerlessmedia.com

Kelly Jones
 PRODUCTION MANAGER
 kjones@peerlessmedia.com

Brian Ceraolo
 PRESIDENT AND GROUP PUBLISHER
 bceraolo@peerlessmedia.com



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When we look beyond the hype of all the new, innovative services and suppliers in this logistics space and view things through the perspective of the past, we can find this delivery service capability has been used efficiently and successfully before.

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The last mile, history repeating

*“History merely repeats itself.
It has all been done before. Nothing
under the sun is truly new.”*

—Ecclesiastes 1:9

BY DAVID WIDDIFIELD

As King Solomon noted nothing new is ever really created, just updated to meet the current environment or situation. This is true of last mile logistics delivering products to consumers. When you look beyond the hype of all the new, innovative services and suppliers in the logistics space and view things through the perspective of the past, we find this delivery service capability has been used efficiently and successfully in the past. We only need to look back to the 1940s and the successes America experienced on the battlefields of World War II.

Rise of the importance of final mile logistics

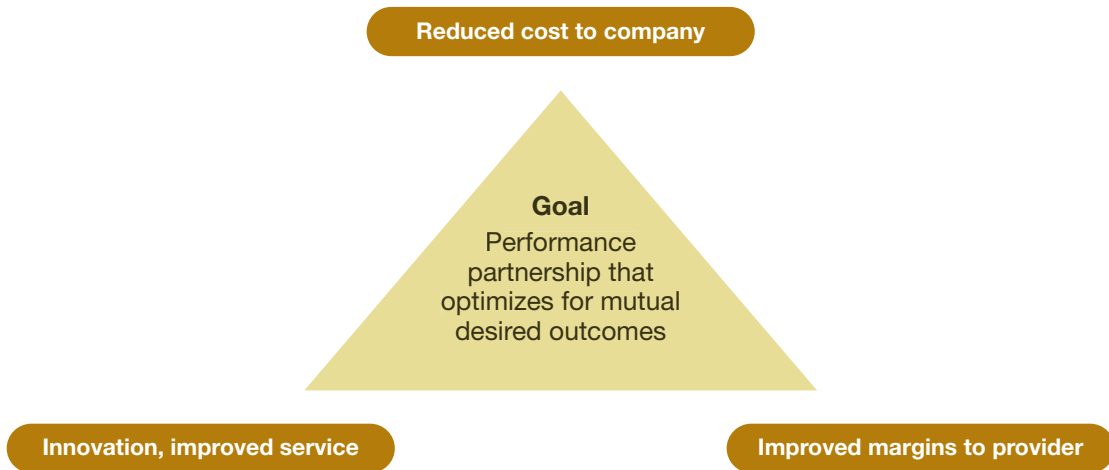
As the U.S. emerged from WWII, military tacticians credited a majority of the U.S. military's success in the European and Pacific theaters to the U.S. capabilities of mass production

enabling the buildup of large inventories of supplies such as ammunition, clothing, food and vehicles, and the ability to combine civilian and military storage and transportation operations to move vast quantities of supplies in an efficient, expeditious manner and

David Widdifield is the director of retail solutions for Crane Worldwide Logistics – DFW in Carrollton, Texas. He can be reached at David.widdifield@craneww.com.

FIGURE 1

Vested outsourcing model



Source: Vitasek, K., Cummins, T., & Ledyard, M. (2010). *Vested Outsourcing: a better way to structure outsourcing contracts*. International Association for Contract and Commercial Management. Ridgefield, CT.

to deliver ammunition, materials, personnel or vehicles to the battlefield when, where and in the right configuration needed to support military objectives. Yet, the logistics lessons regarding the importance of the delivery function getting the product to the end user were quickly forgotten as the war concluded.

Consumers now have virtually **24/7 access to a wide variety of products across domestic and now international geographical boundaries**, coupled with cross border online shopping that brings goods directly to their homes in a matter of a few days.

Shifting from a wartime to peacetime economy unleashed years of pent up consumer demand for goods as disposable incomes rose. The mass production processes that produced war supplies were quickly adapted to the manufacture of consumer goods. However, the processes of efficient distribution methods to deliver goods to the point of consumption were not given as much emphasis. Producers and retailers placed more emphasis on the production of inventory and locating it at central retail locations while minimizing the importance of transportation to satisfy consumers. Consumers were content to acquire their products wherever

they were available as long as they were purchased at the “right” price. Even after Bernard J. (Bud) LaLonde, the noted Ohio State University logistics professor, provided research showing the positive impacts efficient delivery methods could have on consumer satisfaction and profitability, manufacturers and retailers continued to rely on mass production and large inventory levels to meet consumer demand.

This situation, while being updated with modern processes and technology, persisted within the retail sector for the next 60 years until the emergence, and now dominance, of the e-commerce retail channel and the direct delivery of consumer goods to the home. Moving from a novelty, the ability to view goods online has rapidly risen to being the preferred shopping channel. Consumers now have virtually 24/7 access to a wide variety of products across domestic and now international geographical boundaries, coupled with cross border online shopping that brings goods directly to their homes in a matter of a few days.

The efficient delivery operations that focused on the movement of goods from a manufacturer to a retail location are being radically redesigned to handle the movement of consumer goods from a

manufacture, distribution, or retail location. The lessons learned during WWII regarding the importance of being able to deliver goods when, where and in the right configuration to the consumer have now become a guiding principal as retailers develop new delivery capabilities using existing and new equipment, processes, suppliers and technology.

Faster delivery: The emergence of next and same day shipping

As e-commerce continued to grow throughout the 2000s, consumers continued to demand faster delivery of goods to their homes. As this shopping channel has increased, delivery time requirements have decreased. Today e-commerce business is driving approximately 12% of total U.S. retail sales, with some companies reporting as much as 80% of their sales revenues in this channel. This growth rate has been partially attributed to evolving consumer demand for faster delivery service. That really began in 2013, when e-commerce sales reached 6% of total retail sales, and with over 40% of transactions made via a mobile device and requested delivery service of 2-3 days. Today, e-commerce now generates 12% of total retail sales with nearly 60% of transactions conducted via mobile device with standard 1 or same day delivery service.

During 2016, same day delivery service usage increased over 30% from 2015 results as retailers such as, Macy's, Nordstrom and Walmart offered consumers the ability to have online purchases shipped from nearby stores. Even today, the delivery service cycle time is once again being compressed to an hourly and now 10-minute time frame from point of order.

These rapid changes are severely challenging traditional retail logistics models and operations. Note that FedEx and UPS, the two largest U.S. largest parcel carriers, announced the volume of small packages for 1-day or same day service overwhelmed them. Retailers and logistics service providers alike are rapidly assessing and modifying capabilities, networks and supplier relationships to accommodate consumer expectations regarding delivery service needs.

To prepare for this and future shopping seasons,

supply chain managers need to engage key stakeholders (consumers, buyers, manufacturers, procurement/sourcing and service suppliers) to review current logistics operations and strategically assess whether or not they are prepared to meet existing consumer expectations as well as have agility and flexibility in design to change with future consumer needs.

To achieve this goal, supply chain managers and service providers will need greater levels of collaboration and trust to honestly and openly operate their combined logistics network. The development of a collaborative partnership framework is essential to success in this endeavor. One such framework that can be used to guide their efforts and ensure both are successful is the vested outsourcing framework (see Figure 1).

This is the type of collaborative approach in **partnering with an internal or external supply chain service provider** that can ensure your company has the **ability to meet existing and future consumer expectations** along with proactively addressing operational capability and resource constraints.

Developed by Vested Outsourcing Inc. and the University of Tennessee, this framework is based on the principle of mutuality or "what's in it for we" WIIFWe (pronounced "whif-wee"). This means that each party is focused on benefitting the consumer and each other's companies. This is the type of collaborative approach in partnering with an internal or external supply chain service provider that can ensure your company has the ability to meet existing and future consumer expectations along with proactively addressing operational capability and resource constraints.

With the upcoming 2017 holiday season fast approaching and projections from organizations such as Salesforce that a majority of consumers will complete 80% of their holiday shopping online during the Black Friday and Cyber Monday periods, having those final mile logistics capabilities to handle all consumer delivery service levels is going to be critical in defining success or failure for retailers this year and beyond. ☺☺

OUTLOOK: A Complex and Uneven for Global Supply Chains Scenario

Growth is projected to rise over this year and next in emerging market and developing economies, supported by improved external factors—a benign global financial environment and a recovery in advanced economies.

BY PATRICK BURNSON

THE GLOBAL UPSWING in economic activity is strengthening, say analysts for the International Monetary Fund. In their *World Economic Outlook (WEO)* forecast, they note that broad-based upward revisions in the euro area, Japan, emerging Asia, emerging Europe and Russia—where growth outcomes in the first half of 2017 were better than expected—more than offset downward revisions for the United States and the United Kingdom.

But the recovery is not complete, says Sebastian Acevedo, a *WEO* contributor. He notes in the report that while the baseline outlook is strengthening, growth remains weak in many countries, and inflation is below target in most advanced economies.

“Commodity exporters, especially of fuel, are particularly hard hit as their adjustment to a sharp step down in foreign earnings continues,” he says. “And while short-term risks are broadly balanced, medium-term risks are still tilted to the downside.”

Patrick Burnson is Executive Editor of Supply Chain Management Review. He can be contacted at pburnson@peerlessmedia.com.

The welcome cyclical pickup in global activity thereby provides an ideal window of opportunity to tackle the key policy challenges—namely to boost potential output while ensuring its benefits are broadly shared, and to build resilience against down-side risks. A renewed multilateral effort is also needed to tackle the common challenges of an integrated global economy.



Momentum gains

The global pickup in activity that started in the second half of 2016 gained further momentum in the first half of 2017. Growth is projected to rise over this year and next in emerging market and developing economies, supported by improved external factors—a benign global financial environment and a recovery in advanced economies.

Patrick Blagrave, another *WEO* contributor, observes

that growth in China and other parts of emerging Asia remains strong, and the still-difficult conditions faced by several commodity exporters in Latin America, the Commonwealth of Independent States and sub-Saharan Africa show some signs of improvement.

“In advanced economies, the notable 2017 growth pickup is broad based, with stronger activity in the United States and Canada, the euro area and Japan,” he reports.

“Prospects for medium-term growth are more subdued, however, as negative output gaps shrink (leaving less scope for cyclical improvement) and demographic factors and weak productivity weigh on potential growth.”

Changes to aggregate growth forecasts relative to the April 2017 *WEO* are generally positive but modest, with some meaningful changes for spe-

6.6% in April) reflects stronger growth outturns in the first half of 2017 as well as more buoyant external demand. For 2018, the revision mainly reflects an expectation that the authorities will maintain a sufficiently expansionary policy mix to meet their target of doubling real GDP between 2010 and 2020.

Growth forecasts have also been marked up for emerging Europe for 2017, reflecting stronger growth in Turkey and other countries in the region, for Russia for 2017 and 2018 and Brazil in 2017.

The International Monetary Fund notes that BROAD-BASED UPWARD REVISIONS IN THE EURO AREA, JAPAN, EMERGING ASIA, EMERGING EUROPE, AND RUSSIA—where growth outcomes in the first half of 2017 were better than expected.



cific country groups and individual countries.

In line with stronger-than-expected momentum in the first half of 2017, the forecast sees a stronger rebound in advanced economies in 2017 (to 2.2% versus 2.0% foreseen in April), driven by stronger growth in the euro area, Japan and Canada. In contrast, compared with the April 2017 *WEO* forecast, growth has been marked down for 2017 in the United Kingdom and for both 2017 and 2018 in the United States, implying a 0.1 percentage-point aggregate growth downgrade for advanced economies in 2018.

“Activity in the United Kingdom slowed more than anticipated in the first half of 2017,” writes *WEO* contributor Christian Bogmans. “As for the United States, given the significant policy uncertainty, the forecast now uses a baseline assumption of unchanged policies, whereas in April it assumed a fiscal stimulus driven by then-anticipated tax cuts.

Meanwhile, growth prospects for emerging and developing economies are marked up by a percentage point for both 2017 and 2018 relative to April, primarily owing to a stronger growth projection for China.

The country’s 2017 forecast (6.8%, against

has continued to gain momentum over the past months, with a 3.1% expansion projected for 2018. Higher inflation, falling unemployment and strengthening Purchasing Manager Indices (PMIs) all suggest higher GDP growth in advanced markets.

Atradius analysts observe that the U.S. economy leads this trend while the recovery in the eurozone becomes increasingly entrenched. The outlook for emerging markets is also brighter, as Brazil and Russia are emerging from recession, and access to finance remains favorable. While the global economic outlook is more robust than in previous years, political uncertainty remains a downside risk to stability.

However, the main challenges to the global outlook—the threat of deflation, negative bond yields, austerity and low commodity prices—are slowly phasing out.

Global trade is supporting this recovery. After a 1.3% expansion in 2016, trade growth (12-month rolling average, y-o-y) has picked up to 3.3% as of July 2017. The stronger-than-expected expansion is being driven by intra-regional trade flows in Asia and strong import demand from North America.

Risk vs. reward

Atradius Worldwide, a consultancy specializing in trade credit insurance, surety and debt collections, agrees that the global economy

FIGURE 1

Macroeconomic indicators for key markets

	GDP growth (% of GDP)			Budget balance (% GDP)			Current account balance (% GDP)			Export growth			Political risk rating ¹
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018	
Western markets													
Austria	1.5	2.5	1.9	-1.6	-1.0	-0.8	1.7	2.3	2.6	1.4	5.4	3.6	2 POSITIVE
Belgium	1.2	1.7	1.7	-2.6	-2.1	-1.9	-0.4	0.2	0.1	6.0	4.2	3.9	2 STABLE
Finland	1.9	2.5	1.8	-1.9	-1.6	-1.3	-1.1	0.8	0.3	1.3	4.1	3.1	2 POSITIVE
France	1.1	1.7	1.7	-3.4	-3.1	-2.9	-0.9	-1.1	-1.2	1.9	2.9	3.3	2 STABLE
Germany	1.9	2.0	1.9	0.8	0.7	0.6	8.3	7.8	7.3	2.4	3.9	3.6	1
Greece	0.0	1.2	1.9	0.7	-1.4	-1.2	-0.6	-1.3	-1.9	-1.7	1.9	2.0	7 POSITIVE
Ireland	5.1	4.3	3.4	-0.6	-0.5	-0.7	4.7	4.3	4.1	4.7	4.4	3.5	3 NEGATIVE
Italy	0.9	1.4	1.2	-2.4	-2.3	-2.1	2.6	2.5	2.3	2.6	5.0	3.5	4 STABLE
Netherlands	2.2	3.2	2.2	0.4	0.6	0.4	8.5	10.3	9.9	4.1	5.0	4.1	1
Portugal	1.5	2.6	1.9	-2.0	-1.8	-1.6	0.8	0.1	-0.3	4.4	8.3	3.2	5 POSITIVE
Spain	3.3	3.1	2.6	-4.5	-3.3	-2.4	1.9	1.0	1.0	4.4	5.9	5.2	4 POSITIVE
Eurozone	1.8	2.2	1.8	-1.6	-1.3	-1.2	3.6	3.6	3.4	3.2	4.1	3.5	
Australia	2.5	2.3	2.8	-2.0	-1.8	-2.1	-2.6	-2.0	-3.2	7.9	5.9	4.3	1
Canada	1.5	3.0	2.0	-1.9	-2.1	-2.4	-3.3	-2.9	-2.4	1.0	1.9	2.0	1
Denmark	1.7	2.3	1.8	-0.6	-0.6	-0.4	7.9	8.6	8.5	2.5	4.0	2.5	1
Norway	0.8	1.9	2.1	3.0	4.2	3.8	5.0	5.4	5.2	-1.9	2.1	2.1	1
Sweden	3.3	2.9	2.6	0.9	0.9	0.9	4.5	4.5	4.4	3.1	2.9	2.8	1
Switzerland	1.4	0.8	1.8	0.7	0.7	0.2	10.6	10.9	11.1	6.5	1.3	2.1	1
United Kingdom	1.8	1.6	1.4	-3.0	-3.6	-3.6	-4.4	-4.5	-4.0	1.8	3.1	3.3	2 STABLE
United States	1.5	2.2	2.4	-3.2	-3.4	-3.7	-2.4	-2.8	-2.6	-0.3	3.6	2.6	1
Central & Eastern Europe													
Czech Republic	2.5	4.2	3.1	0.6	-0.1	-0.3	1.1	0.9	0.5	4.3	7.2	5.5	3 POSITIVE
Hungary	2.0	3.8	3.4	-1.9	-2.5	-2.7	5.4	3.4	2.5	5.8	6.2	5.4	4 NEGATIVE
Poland	2.7	4.1	3.5	-2.5	-2.2	-2.6	-0.2	-0.4	-0.5	9.0	8.7	7.4	3 NEGATIVE
Russia	-0.2	1.7	1.8	-3.4	-2.1	-1.3	2.0	3.5	2.3	3.1	5.8	2.0	5 NEGATIVE
Slovakia	3.3	3.3	3.6	-1.7	-1.6	-1.3	-0.7	-0.2	0.7	4.8	4.0	4.6	3 POSITIVE
Turkey	3.2	5.0	3.6	-1.1	-2.0	-2.3	-3.8	-4.2	-4.0	-1.8	7.1	4.0	5 STABLE
Asia													
China	6.7	6.8	6.4	-3.8	-3.9	-4.4	1.7	1.0	1.3	3.5	5.3	3.4	3 STABLE
India	7.1	6.8	7.5	-3.5	-3.2	-3.2	-0.5	-1.0	-1.1	4.4	4.2	3.9	4 NEGATIVE
Japan	1.0	1.6	1.2	-4.6	-4.5	-5.0	3.8	3.9	4.5	1.1	5.7	3.9	3 POSITIVE
Latin America													
Brazil	-3.6	0.8	2.4	-6.4	-8.1	-7.1	-1.3	-0.6	-1.4	1.9	2.8	1.8	5 POSITIVE
Mexico	2.3	2.2	2.3	-2.6	-1.9	-2.3	-2.2	-1.6	-1.9	1.3	4.1	3.1	4 POSITIVE

¹ Note: STAR is Atradius' in-house political risk rating. The STAR rating runs on a scale from 1 to 10, where 1 represents the lowest risk and 10 the highest risk. In addition to the 10-point scale there are rating modifiers associated with each scale step: 'Positive', 'Stable', and 'Negative'. These rating modifiers allow further granularity and differentiate more finely between countries in terms of risk.

Sources: Consensus Economics, Macrobond, Economist Intelligence Unit, Atradius Economic Research

Despite political uncertainty, most high-frequency indicators point to sustained growth: the global composite PMI held steady at 54 in September, pointing to a solid and stable rate of expansion. This has motivated some dramatic upward revisions of trade growth forecasts in 2017. The World Trade Organization (WTO) raised its 2018 forecast for merchandise trade growth to 3.6% from 2.4%.

Oil prices have also been increasing over the past month with Brent crude oil reaching about \$58 per barrel. The price increase is supported by lower OPEC production as well as fears of supply disruptions surrounding the Kurdish independence referendum in Iraq.

The welcome cyclical pickup in global activity thereby provides AN IDEAL WINDOW OF OPPORTUNITY TO TACKLE THE KEY POLICY CHALLENGES—namely to boost potential output while ensuring its benefits are broadly shared, and to build resilience against downside risks.



At the same time, U.S. shale production is expected to keep prices muted in the short term, and OPEC is likely to extend its production cut agreement past the March 2018 deadline. The U.S. Energy Information Administration forecasts Brent crude oil to average \$51 per barrel in 2017 and \$52 in 2018.

Atradius economist, Dana Bodnar concludes that while the outlook for 2018 is optimistic, there remain several downside risks that could very well reverse this.

“We have a number of concerns,” she notes, “included a misguided Fed policy.”

She observes that with leadership change, there is higher risk that interest rate hikes and quarterly earning reductions may occur more quickly. This would cause financial market turbulence and a reversal of capital flows from emerging markets.

A China “hard landing” is another worry, Bodnar claims, adding, “Should economic growth in China slow to below 6% next year (we now forecast 6.4%), negative effects would spill-over into countries dependent on trade with or investment from China and would weigh on global trade growth and commodity prices. Like misguided Fed policy, it would also drive financial market volatility and capital outflows from EMEs.”

According to Bodnar, U.S. protectionism is another “unknown” for economists. She says that while policy uncertainty risk in the U.S. has eased through 2017, there remain difficult negotiations around NAFTA particularly as well as smaller protectionist measures being taken,” she says. “This runs the risk of slower trade and GDP growth in countries with close trade ties to the U.S. as well as the nation itself.

As with other economists, Bodnar is keeping a keen eye on oil price volatility, which she sees as becoming increasingly risky. She argues that the oil price may correct itself upwards after years of low investment in the low price environment. This could help some emerging market oil exporters but would be outweighed by the negative impact of price uncertainty on investment.

Finally, there are geopolitical risks to consider. “While political uncertainty has eased in advanced markets,” Bodnar maintains, “flare-ups of unrest and violence in the Middle East or Korea could have negative impacts on global growth, largely through lower confidence, driving up risk premiums for emerging markets and hampering access to finance for firms.”

Marianne Rowden, President & CEO of the American Association of Exporters and Importers (AAEI), agrees, noting that 2017 had been a year of great disruption for global trade professionals. Trade agreements are being canceled and renegotiated, regulatory enforcement is on the rise, the timeline for Brexit is approaching,

political instability is a growing concern, and catastrophic weather-related events have disrupted supply chains worldwide. “Networks that had been relatively stable for years are now in flux,” she says. “Now more than ever, companies need to re-engineer processes and supporting systems to achieve a totally new level of agility to respond to these market forces.”

More inclusive global value chains

A new report from leading think tanks and foreign policy experts comes to the same conclusion, but posits that “more inclusive” global value chains can advance productivity and growth in developing countries.

The findings were presented by the World Bank Group, which worked with the WTO, OECD, Institute of Developing Economies (IDE-JETRO) and the Research Center of Global Value Chains of the University of International Business and Economics (UIBE) on the research. According to the *Global Value Chain Development Report*, global value chains (GVCs) are transforming world trade, but must be more inclusive if they are to deliver greater benefits to developing countries and smaller companies.

“Global value chains are helping to advance the development process in many countries, including developing countries where they contribute to increased productivity, more international trade and faster growth, all of which benefit entire populations” notes Anabel Gonzalez, Senior Director for the World Bank Group’s Trade & Competitiveness Global Practice. “Our report shows how countries can maximize the benefits of GVCs by moving to higher-value added activities, lowering trade costs and making GVCs more inclusive.”

Analysts say GVCs create new opportunities for developing countries, increase their participation in global markets and enable them to diversify exports. But while global value chains

have helped many developing countries to advance, some countries have benefitted more than others, with some countries, small- and medium-sized firms, and workers in developed and developing economies still being left out.



Higher inflation, falling unemployment, and strengthening Purchasing Manager Indices (PMIs) ALL SUGGEST HIGHER GDP GROWTH IN ADVANCED MARKETS.

Several factors determine how deeply a country participates in GVCs, the report finds. Non-tariff trade costs, such as freight, insurance, fees, regulations, bureaucracy or weak transportation links, are a significant determinant of GVC participation. According to the report, in some complex value chains, such as motor vehicles, computers or machinery, non-tariff trade costs are more than four times higher than tariffs.

“Addressing these trade costs is a key factor to improving participation in GVCs and maximizing the benefits from that participation,” according to Nadim Ahmad, Head of the OECD’s Trade and Competitiveness Statistics Division.

“Multilateral agreements play a crucial role in lowering trade costs, and ensuring that all economies, particularly the poorest, benefit from trade cost reductions,” reports Robert Koopman, Chief Economist of the WTO. “Preferential trade agreements (PTAs) can also be very helpful as they often result in deeper commitments in particular areas.”

The report also finds that proximity to the world’s three major production hubs—the United States, Asia, and Europe—is highly important. It also matters who a country’s trading partners are, how far the country is from high-income markets, and the degree to which partners are integrated within regional global value chains. ☺☺

Accelerating into uncertainty

Buffeted by crosswinds as the pace of change accelerates, the logistics industry is accelerating into uncertainty.

BY SEAN MONAHAN AND
MICHAEL ZIMMERMAN

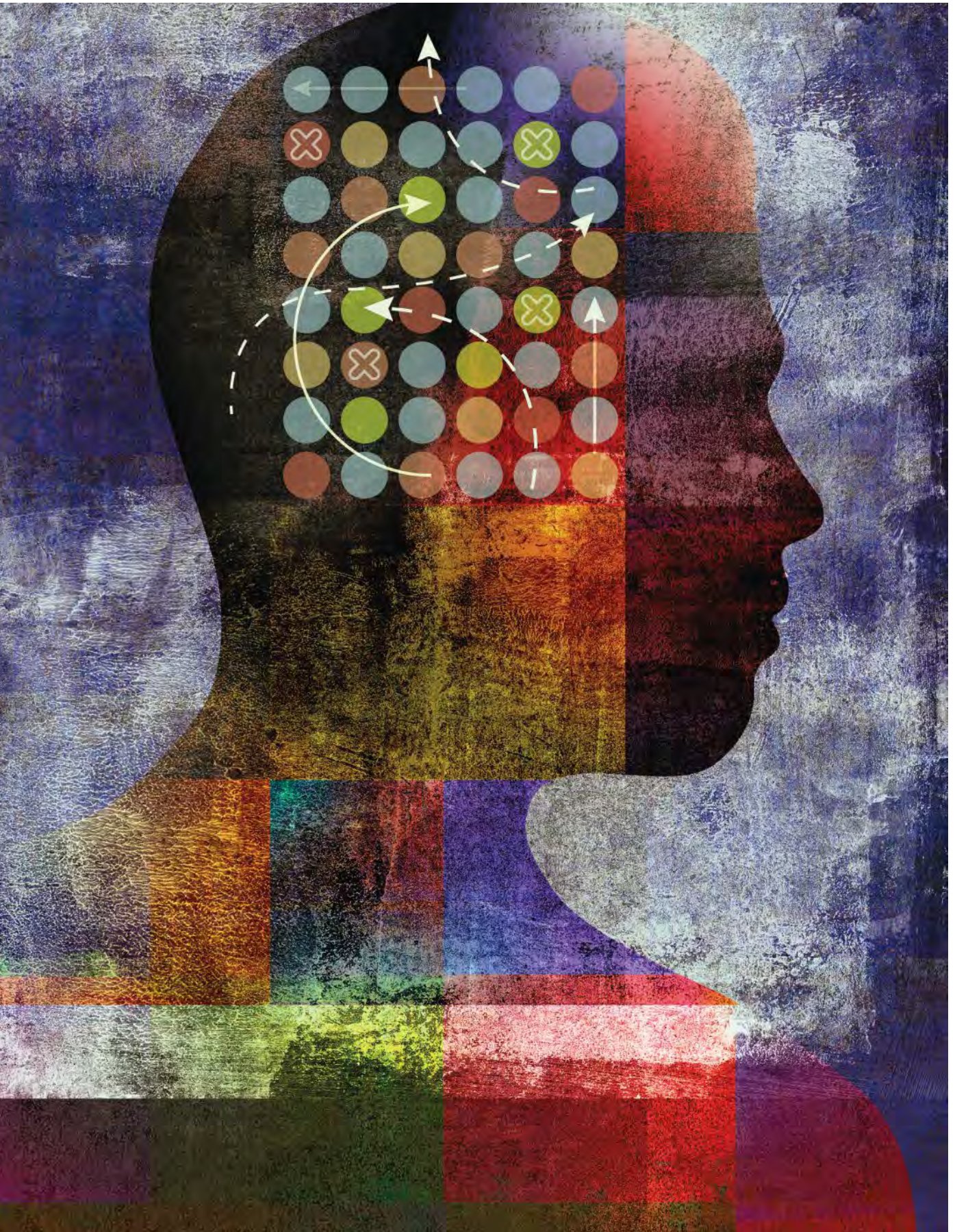
“It behooves us to adapt ourselves to the times if one wants to enjoy continued good fortune.”

—Niccolo Machiavelli (1469-1527)

Sean Monahan is a partner and global lead for the Operations and Performance Transformation practice at management consulting firm A.T. Kearney. He is based in New York and can be reached at Sean.Monahan@atkearney.com. Michael Zimmerman is a partner and Americas lead for the Analytics practice at management consulting firm A.T. Kearney. He is based in New York and can be reached at Michael.Zimmerman@atkearney.com.

Industries churning with economic and political disruption. Technology and innovation undermining old business models. Consumers demanding immediacy, personalization and convenience. These are just some of the insights revealed in the Council of Supply Chain Management Professionals’ “2017 State of Logistics Report” authored by A.T. Kearney. Buffeted by crosswinds as the pace of change accelerates, the logistics industry is accelerating into uncertainty. As the year closes, the geopolitical arena is sending an array of mixed signals that vexes decision-makers, who see consumer confidence rise while GDP growth disappoints, and government officials struggling to take clear action related to growth, infrastructure and trade policy. The industry appears destined for a prolonged bout of cognitive dissonance, coupling frustration over subpar growth with the optimism reflected in rising stock market values, technology investments and consumer confidence data.

As company leaders weigh options in a fast-changing business environment, they also face increasing political risk. Rising protectionist sentiment around the world threatens to constrict global trade flows, the lifeblood of logistics. Political decisions on tax relief, regulatory reform and trade restrictions will all have an impact on logistics. A.T. Kearney identifies four scenarios that have the potential to significantly affect profitability, and even the future viability of some logistics sectors (see Figure 1).



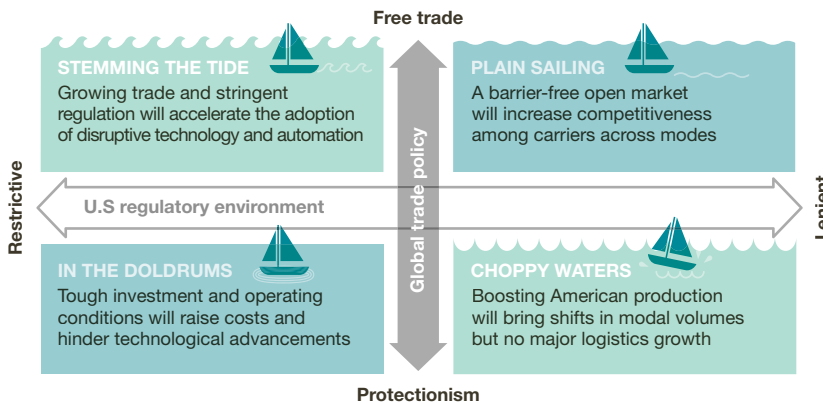
Scenario 1: Plain sailing. With trade barriers and onerous regulations minimized, a truly frictionless market emerges and competition among carriers drives down costs. Shippers benefit from lower costs and better service as carriers differentiate themselves through innovation. Investment in supporting infrastructure is essential, but regulators try to balance safety and sustainability with business-friendly

elements focus on established solutions that face fewer regulatory hurdles, such as truck platooning and clean-fuel vehicles. Carriers that can't afford such investments fall behind.

Scenario 4: In the doldrums. Restrictive U.S. trade policies create strong headwinds for carriers while tough economic conditions impede adoption of new technology that might improve matters. A price-slashing race to the bottom ensues,

FIGURE 1

Four scenarios



Source: A.T. Kearney analysis

leaving only the financially strongest carriers standing as overall volume in the industry declines. Shippers benefit from lower prices at first but eventually face higher rates as carrier attrition reduces industry capacity and import costs rise. Some carriers with financial wherewithal turn to technology to survive, adopting productivity-boosting tools such as predictive analytics and connected vehicles.

Each of these potential scenarios carries distinct and specific implications for various US logistics stakeholders, but the likely new impact of any possible outcome is unclear.

deregulation. Meanwhile, powerful incentives to reduce trade inefficiencies spur adoption of new technologies like blockchain-enabled “smart contracts.”

Scenario 2: Choppy waters. A renewed emphasis on American manufacturing and labor revives domestic industries such as heavy manufacturing and steel. The unique logistical needs of these industries lead to modal shifts: Rail traffic increases while cross-border trucking and port activity decline as import tariffs and other trade barriers force companies to source more raw materials and components domestically. Carriers scramble to adjust their service offerings and assets, and shippers prepare for possible supply disruptions as carriers navigate the shift. From a technology perspective, “Uberization” of freight accelerates, taking on a key role in realigning inflexible freight networks to serve a growing domestic manufacturing base.

Scenario 3: Stemming the tide. Tighter regulations on emissions and driving hours—perhaps accompanied by the unionization of truck owner-operators—boost shipping costs and possibly diminish service levels. But rising global trade volumes motivate major carriers to pump capital into new technologies that reduce costs for shippers. Initial invest-

Forecasting the future is always difficult, especially when an unsettled political environment makes it hard to predict the likelihood, breadth and speed of potential policy changes. As we look to the future, supply chain management professionals must weigh current macroeconomic factors affecting logistics with their own state of preparedness, and uncover ways to accelerate opportunities.

Optimism amid uncertainty

The International Monetary Fund predicts 3.5% worldwide economic growth in 2017 as prospects brighten in key developed and emerging markets. Stronger performance in the United States is a big factor in global growth expectations. Resurgent domestic demand has lifted growth as incomes have risen, job prospects improved, household wealth increased and inflation remained low. Consumer spending has averaged 4.5% monthly growth since last fall, and the National Retail Federation forecasts 3.7 to 4.2% retail growth in 2017. Retailers account for a big share of business at third-party logistics providers, while surging digital sales channels drive growth at parcel delivery companies and others involved in e-commerce fulfillment.

Table 1. Logistic Sector Highlights

Motor Carriers	Results through Q3, compounded by hurricane-driven demand spikes, support carrier optimism as rates continued to rise. Carriers expect rates will continue to firm up well into 2018 as stronger economic growth helps to reduce excess capacity.
Shipper-Carrier Relationships	Advanced technologies and better processes are reshaping business models and redefining relationships. Methods such as multiple-round annual bidding, closer collaboration on best lane and load allocation, and detailed feedback drive efficiencies. More shippers are embracing Dedicated Contract Carriage (DCC) arrangements that lock in capacity, rates and service levels while mitigating potential service disruptions caused by regulatory changes, but they are also expecting DCC providers to leverage technology and their networks to monetize backhauls.
Parcel	E-commerce has turned parcel delivery into the hottest logistics sector. Parcel volumes rose 6% last year as online retailers flooded delivery networks with small packages destined for individual consumers in their houses, apartments, offices, and dorm rooms. The surge shows no sign of abating, and forecasters predict parcel shipping revenues will climb to \$93 billion by 2019 from \$78 billion in 2015. Unprecedented growth has altered parcel industry relationships. For example, Amazon is UPS's largest customer, but the online retailing giant launched its own delivery service in 2016. Traditional parcel carriers stand to lose significant volumes as shippers expand in-house logistics operations.
Rail	Despite revenue and volume declines, operating ratios are improving as railroads focused on productivity; service levels went up and railroads reduced dwell times and increased train speeds.
Water	Waterborne shipping rates fluctuated dramatically in a tumultuous year. Carriers have managed to hold onto a good portion of improved rates in 2017 by idling ships and accelerating scrapping to constrain capacity. But, if history is any guide, capacity discipline will crumble as carriers continue building ever-larger ships that swamp the market with new supply and send prices plunging.
Air Freight	Demand is expected to be strong for the next five years, powered by e-commerce and pharmaceutical shipments. Such pricey cargo is the lifeblood of air freight, which represents less than 1% of global shipping volumes last year but more than one-third of total value. Air freight depends heavily on international trade making it susceptible to increased protectionist sentiment around the world. To offset depressed load factors, freighter airlines are developing innovative cost-cutting tactics, such as dedicated hubs at smaller airports that offer lower freight handling fees and greater scheduling flexibility.
Pipeline	The midstream oil and gas pipeline industry retrenched last year as volumes and rates flattened out under pressure from substandard oil prices. With leaner cost structures, improving industry fundamentals, and favorable political conditions, pipeline companies can grow profitably at lower prices.
Freight Forwarding	Business is on the verge of disruption as global economic trends pressure profit margins while new competitors and technologies undermine longstanding business models. Outsiders including technology giants IBM, Verizon and T-Systems see an opportunity to disrupt the largely paper-based freight forwarding industry by offering cutting edge digital capabilities unavailable from most forwarders. E-commerce powerhouses Alibaba and Amazon are inviting other shippers to help fill space in their cargo containers, cutting forwarders out of the loop.
Third-Party Logistics	Third-party Logistics is evolving away from a transactional business model focused on discrete services such as transportation management or warehousing and toward a one-stop-shop for end-to-end logistics solutions. The demand for one-stop logistics services is strongest among small companies that spend less than \$30 million a year on logistics and large shippers that spend more than \$300 million. Smaller shippers say one-stop shops offer access to larger volumes across various transportation modes, while large shippers hope single-source providers can better manage complex worldwide logistics networks and global P&L requirements.
Warehousing	Operators are turning to new technologies to meet the demand as e-commerce surges. Many are also designing seamless inventory systems that integrate warehouse fulfillment across various customer purchasing channels to create omnichannel delivery capabilities. Widespread adoption of fulfillment methods such as ship-from-store and in-store pickup of online orders is improving inventory allocation, speed-to-market and peak-season variability management.

Consumer sentiment is up, but 2017 GDP remains disappointing despite recent optimism based on second and third quarter results. Orders for non-defense capital goods (a proxy for business investment) edged down in 2016 even as business confidence indicators remained sky-high. However, the positive trend since the first half of 2016 continues to reflect growing optimism. Business inventory-to-sales ratios have remained relatively stable as companies appear uncertain about future demand. Continued uncertainty over future economic trends impedes longer-term planning throughout the supply chain, forcing companies to continuously monitor inventory levels and exacerbating month-to-month fluctuations in freight volumes.

Adapting logistics while preparing for disruption

Overall spending on logistics dropped despite a rise in energy prices. This marks the second straight year in which the two have moved in opposite directions, indicating energy prices are no longer the primary factor in logistics costs. This year reinforces the powerful impact of rising consumer demand for e-commerce deliveries. While overall transportation costs fell .7% last year, spending on package delivery services jumped 10%. Parcel and express delivery has surpassed railroads as the second-largest logistics sector behind motor freight. Meanwhile, energy-sensitive pipelines and railroads saw rates and volumes stall or drop as oil prices remained at historically low levels despite the upturn in 2016. Cross-currents also affected inventory carrying costs last year. Storage expenditures rose 1.8% and are now as important as the financial carrying cost of inventory, and are expected to keep growing as available space grows scarcer.

There are common trends driving the action across various logistics sectors (see Table 1). Overcapacity and rate pressures fueled cost-cutting and consolidation, particularly among motor carriers and ocean freight companies. Cutting-edge technologies brought new efficiencies to sectors such as warehousing, parcel delivery and motor freight. Along with technological advances came new business models in third-party logistics, freight forwarding and rail, among others. Parcel carriers and warehousing capitalized on surging e-commerce volumes to raise rates and continued reconfiguring their networks to meet consumer expectations for faster delivery.

Politics and government policy-making will have major

positive or negative impacts on all logistics sectors. The best scenario would see pro-growth measures enacted quickly in the United States while political leaders around the world reject protectionism and renew their commitment to global trade flows that boost demand for logistics services. In the worst scenario, the pro-business domestic agenda stalls in Congress while import barriers spark trade warfare, damaging the entire logistics industry.

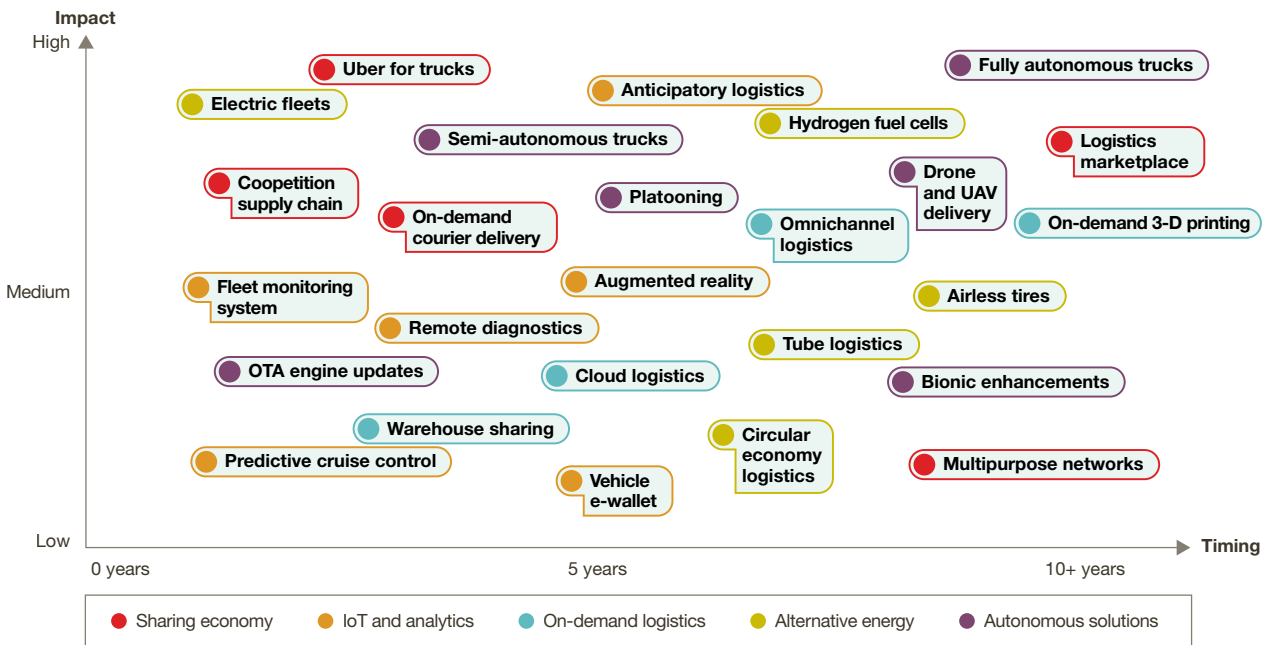
Technological innovations enabling next generation

While conflicting political signals leave shippers and logistics providers with little clarity on economic fundamentals as they make vital decisions about capacity, pricing and strategy, one constant remains. Changing consumer trends and innovations catalyzed by today's nascent technology are shaping the next-generation supply chain. Customers will expect immediacy, personalization and convenience; new technologies and advanced analytics will be the enablers.

A fluid, connected digital supply chain would allow manufacturers and retailers to fulfill shipments from assembly lines, warehouses, urban distribution centers and brick-and-mortar stores. Inventory requirements may decline as 3-D printing enables manufacturers to fabricate spare parts on demand and retailers to personalize merchandise for individual customers. With shipping focused on same-day, last-mile delivery, new vehicles such as sidewalk robots and aerial drones would proliferate. Algorithms matching carrier or original equipment manufacturer assets to shippers' needs would give rise to a ride-sharing model for long haul shipping, further encouraging shared vehicle ownership and reducing demand for vehicles. Carriers would invest in sustainable assets that save money and resonate with environmentally conscious consumers. Significant advances are already taking root. The logistics community is developing a wide range of next-generation capabilities that will disrupt multiple modes of transportation (see Figure 2).

Connected vehicles and "Uberization" have the greatest near-term disruptive potential. Several manufacturers already produce connected trucks outfitted with hundreds of sensors that collect and transmit vehicle performance data, enabling carriers to increase uptime through predictive maintenance. Energy efficient technologies and practices have weakened the link between energy prices and logistics costs, a trend likely to continue as electric powertrains and

FIGURE 2
Innovation grid: a 10-year outlook



Notes: IoT is Internet of Things. UAV is unmanned aerial vehicle. OTA is over-the-air.

Source: A.T. Kearney analysis

hydrogen fuel cells create alternatives to gasoline-powered vehicles. Several of these capabilities are coming on faster, with greater potential to transform logistics.

Accelerating into the future

Logistics is moving toward a fully digital, connected and flexible supply chain optimized for e-commerce and last-mile, last-minute delivery. The next-generation supply chain will enhance fulfillment capabilities and drive efficiencies through technologies ranging from big data and predictive analytics to artificial intelligence and robotics. The industry must also reckon with the social cost of rapid technological evolution as automation tempers employment growth or eliminates hundreds of thousands of traditional jobs in warehouses, trucking and other sectors.

The four scenarios each carry distinct and specific implications for US logistics stakeholders. Plain sailing assumes regulatory constraints recede, global trade flourishes and technology improves efficiency. Choppy waters anticipate new policies favoring US manufacturing forcing shippers and logistics companies to adapt, spurring faster adoption of technologies. Stemming the tide brings tighter regulations

that increase operating expenses and accelerates investment in cost-saving technologies. The last scenario, puts logistics in the doldrums as regulatory costs rise and tough economic conditions deter technology investments.

In this unsettled environment, the first step for any shipper or carrier is to identify the major forces at play in each scenario and articulate the most extreme manifestations of each, and how combinations of factors could influence your potential strategic responses. Next, consider emerging technological innovations, regulation and trade policy. While technology will shape the next-generation supply chain over the long term, decisions by regulators and policy-makers in the near term will determine the speed and direction of its evolution. Identify which innovations are most likely to influence your strategy and assess the potential implications for rapid or delayed adoption. Finally, create a flexible framework of well-informed strategic choices to guide decision-making. Although some scenarios may seem more likely than others, successful companies hope for the best-case scenario and prepare for the worst-case scenario as they chart routes to growth in a world accelerating toward a new era of uncertainty. ∞∞

Is supply chain management strategic or tactical? Are the best supply chains collaborative? Should the goal be an integrated supply chain, or an integrative supply chain?

Those are questions I've heard posed by many thought leaders. The answer to all three questions is a mixed bag. Let's start with the strategic supply chain. For years, most supply chains were tactical, focused on the most efficient and cost-effective way to get product out the door and into the hands of customers. Increasingly, albeit slowly, there is some recognition that the best supply chains are those that enable a company's go-to-market strategy. Take that one step further, and the next generation supply chain could be one where cost-cutting is no longer job No. 1. Rather, the goal is running a supply chain aligned with your customers' metrics.

Making that shift in a profession that is better at turning out tacticians than strategic thinkers will require a new kind of manager. These two previously-published pieces, the first in a series on the strategic supply chain by Steven A. Melnyk and his co-authors, describe the new supply chain and the new professionals required to manage it.

—Bob Trebilcock, editorial director



Steven A. Melnyk, Ph.D., is a professor of operations and supply chain management in the department of supply chain management, Michigan State University. His most recent article, "Myths And Truths: Misadventures In Supply Chain Management," was published in January 2016. He can be reached at melnyk@msu.edu. For more information, visit broad.msu.edu/facultystaff/melnyk.



The strategic supply chain requires a new kind of leader; one with skills and orientations not currently found in many supply chain managers. Here's what we need to complete that change, and the steps to get there.

The emergence of the strategic leader

BY STEVEN A. MELNYK

Supply chain management is on the cusp of a metamorphosis. For as long as the term has been in use, supply chain practitioners have been tacticians. They focused on making sure that the production lines rolled and orders were filled in the most cost efficient and timely manner. Execution and firefighting were highly valued skills. The profession even had its own language and metrics, apart from those used at the C-level.

Whether those same skills will serve tomorrow's supply chain manager is very much up in the air. That is especially true as supply chains are transforming from tactical to strategic. In this new model, the key challenge is to harness the supply chain to deliver on a business' go-to-market strategy by focusing on a broader set of outcomes—outcomes such as responsiveness, innovation and sustainability. Indeed, many supply chain managers are questioning whether they or their organizations will have what it takes to make this change.

In a recent survey of supply chain issues published in *CIO Journal*, Deloitte noted that the major concern facing the executives it surveyed was the lack of adequate supply chain talent. Indeed, only 38% of the respondents were confident that their organizations had the required competencies today. They were even less optimistic about the future: Only 44% felt confident that they would have the skills required to meet their needs five years from now. On one hand, this finding emphasizes the fact that there

is a supply chain talent crisis—a fact of which most supply chain managers are only too painfully aware. Yet, of more importance than the numbers is the nature of the skills respondents believe will be required of supply chain leaders in the future.

As can be expected, being technologically savvy is seen as important (including the ability to understand and integrate the technological capabilities offered by such developments as Big Data analytics, 3D printing, artificial intelligence and wearable technology); but the management skill that causes the greatest amount of concern is that of critical thinking and problem solving (Figure 1).

This finding leads to three critical conclusions:

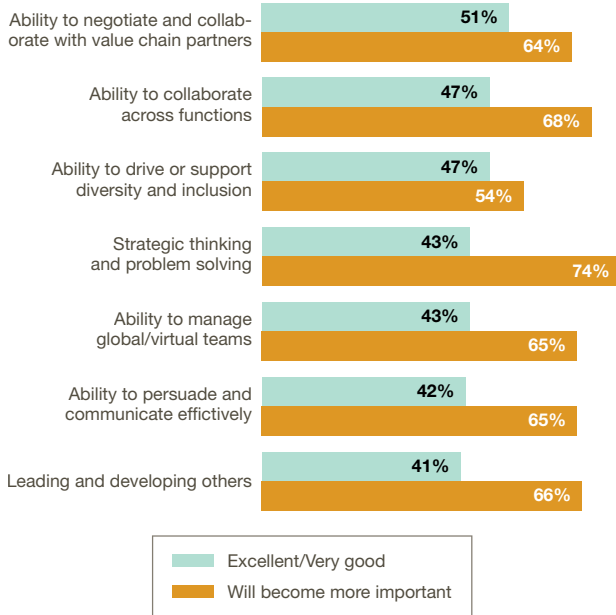
- 1** The supply chain is changing; metamorphosing from a tactical entity that is often seen as more risk than benefit—a necessary evil where the “best” supply chain is the one that you never hear of—to being seen as a strategic capability that enables and enhances the ability of a firm to gain a significant competitive advantage in the marketplace.
- 2** The existing supply chain manager is not up to the task of managing or tapping into the promise of this new supply chain.
- 3** A new type of leader is needed to manage this new supply chain.

While that may sound simplistic, there is other evidence to support these observations. Currently, the department of supply chain management at Michigan State University,

FIGURE 1

Wanted: Leadership capabilities

Leadership and professional competencies of company's employees; current performance versus expected change in importance



Source: Third Annual Supply Chain Survey, Deloitte, 2015

in conjunction with APICS, has undertaken “Supply Chain Management: Beyond the Horizon,” a multi-year study focused on identifying the developments that will affect the supply chain of the future. The findings to date support these three conclusions. This crisis exists in part because of the inability of the current generation of supply chain managers to clearly articulate that supply chain management is not a solution (like Lean or Total Quality Management) but rather a set of capabilities that can determine what the firm can and cannot do. In a recent article in *Forbes*, SCM World’s Kevin O’Marah contended that the supply chain should be aligned with the desired outcomes prized by the key customers and the strategic promises made by the firm, as contained within the value proposition.

We could not agree more that in tomorrow’s supply chain, strategy will be as important—if not more important—than tactics and execution. And tomorrow’s manager will need to understand how to speak the same business language as senior management.

In this article, we intend to expand on the three major conclusions previously presented. We will examine how the supply chain is changing (and the factors that are

causing this change). We will look at why the current crop of supply chain managers will have difficulty meeting the challenges and demands created by this new supply chain. Finally, we will explore the skills and capabilities demanded of the new supply chain manager; requirements that transform the supply chain manager of today into the supply chain leader of tomorrow.

As part of this final discussion, we will discuss the challenges facing firms, educational institutions and professional societies as they struggle to develop this new generation of strategic leaders. However, before we discuss the challenge of creating the leaders of tomorrow, we must begin by understanding the changes now taking place in the supply chain.

The new supply chain

Since the term was first introduced in the *Financial Times* in 1982, the supply chain and how it is perceived within the firm has greatly changed. Initially, managers outside of the supply chain saw it as tactical, consisting of terms such as planning horizons, capacity, advanced delivery notices and Lean. At the heart of supply chain was a combination of boxes, trucks, factories and shipping orders. CEOs and senior managers only became aware of their supply chains when there was a disruption, especially one that made the news. They learned the hard way that supply chain disruptions can hurt their firm operationally and strategically. Thanks in a large part to academic research, they also learned that a supply chain disruption was often followed by a 40% drop in their stock price that took nearly two years to recover. This led to an interesting phenomenon—the attractiveness of the “invisible” supply chain: Because the only time senior management ever heard about a supply chain is when something went wrong, the “best” supply chain must be one that they never heard about.

That view is changing—and changing radically. Managers and corporate leaders are starting to recognize the strategic value of their supply chain to their firms. This change can be attributed to the following factors:

- **Increasing rate of technological advances that are rooted in the supply chain.** The media is awash with articles about the Internet of Things (IoT), 3D printing, Big Data and analytics and autonomous vehicles (self-driving trucks and cars). These new technologies are changing how firms design, build and deliver products, and how they interact with their customers. Tire manufacturer Pirelli has introduced sensors into truck tires that collect

information about the durability and performance of its products. That is allowing Pirelli to offer its customers new capabilities for better vehicle protection and control and should lead to better tire designs in the future. Similarly, Amazon is experimenting with 3D printing on trucks so that goods can be built as they are being delivered to customers, while online clothier M-Tailor draws on the improved photographic power of cell phones to help its customers design, make and deliver shirts specifically configured to their unique physical characteristics.

- **Acceptance of complexity as a business driver.**

In the past, complexity was viewed as something to be avoided at all cost because it added cost. Now, firms recognize that their customers are driving the demand for complexity. If a customer is willing to pay for something done in a unique way, the firm can make the customer aware of the hidden costs and dangers but ultimately, it needs to deliver. In part, the ability of the supply chain to deal with this increased demand for complexity is being enhanced by the new technologies discussed above.

- **New competitive pressures.** How a firm serves and interacts with its customers is being influenced by the experiences of its customers with other providers, especially Amazon. This has given rise to the “Amazon effect”—the impact exerted on both customers and firms by Amazon’s relentless emphasis on quickly connecting its customers to new and innovative solutions. Once Amazon rolls out a new service, its customers come to expect the same level of service from their other providers. For example, at the 2015 Supply Chain Outlook Summit, a supplier of industrial equipment explained that when one of its customers was told that there would be no customer service on weekends, the customer threatened to pull out of negotiations. The customer argued that if Amazon could provide support on the weekend, then the equipment supplier should also. Dealing with the Amazon effect often requires changes to the supply chain.
- **New methods of dealing with customers.** Increasingly, the customers of B2B and B2C businesses expect to be able to place orders and find information through various means, whether through brick and mortar retail locations, on-line or through smart phone apps. This “buy from anywhere, anytime and on any device” mentality has led to the emergence of the omni-channel experience. To a large extent, the success or failure of delivering on an omni-

channel strategy depends on the supply chain system and its leadership.

- **Recognition that cost is no longer enough.** Traditionally, delivering a product or service at the lowest cost was the primary measure of supply chain performance. That



If a customer is willing to pay for something done in a unique way, the firm can make the customer aware of the hidden costs and dangers but ultimately, it needs to deliver.

view is now changing. As this author and others noted in the *MIT Sloan Management Review* in 2010, supply chains can achieve more than just cost reductions; they can offer improved security, innovation, responsiveness, sustainability, resilience and quality. To understand the competitive value of these other outcomes, consider the impact of Zara on the retail apparel industry. The fast fashion producer became a global powerhouse by emphasizing responsiveness with production near the markets it serves at a time when its competitors were focused on cost, and, as a consequence, outsourcing to low cost countries such as China.

- **Customer demands for greater supply chain visibility.**

Customers, especially in North America and Europe, want assurances that their products are being produced safely and without adverse impacts. Companies such as Disney now recognize that they are accountable for actions taken anywhere in their supply chain, whether those involve first tier or fourth tier suppliers. That is one reason why Disney announced in 2013 that it was pulling production out of Bangladesh, Pakistan, Ecuador, Venezuela and Belarus due to concerns over safety standards for supply chain workers in those countries.

When these and other changes are taken as a whole, what we see is a transformation of the supply chain from a necessary evil and source of risk to a strategic asset that enhances a firm’s competitiveness in the marketplace by offering one or more of the following three advantages:

- deliver goods and services faster, better and cheaper (the lowest form of competitive advantage);
- enable the firm to address customer needs that are currently being met poorly; and
- enable the firm to address customer needs currently not being met at all (the highest form of advantage).

The traditional supply chain leader

While that all sounds good, the biggest hurdle to completing this transformation is that many of the supply chain managers currently in leadership positions are not prepared to harness the capabilities of this new supply chain. In part, this



To a large extent, the success or failure of delivering on an omni-channel strategy depends on the supply chain system and its leadership.

is because many have not been formally trained in supply chain management. More importantly, these problems can be traced to their functional orientations and preparation—preparations that have imparted in them the traits below.

- **Strong functional orientation.** These are managers who feel most comfortable working with other similar people. Interactions with other functions are handled through hand-offs, best described as decisions that are “thrown over the wall” to other groups with little or no input from them.
- **Strong focus on cost.** Cost reduction is the universal benchmark. But just as no good deed goes unpunished, this can have unintended consequences. That was the lesson learned by one major farm equipment manufacturer after it implemented a world class Lean/Just-in-Time system with the stated goal of driving down cost. Unfortunately, a laser focus on cost reduction adversely affected the manufacturer’s ability to be responsive during a time when demand was greatly changing (thus hurting the company’s competitive position in the short term).
- **Strives for supply chain excellence.** The goal to develop a best-in-class supply chain on specific measurements, such as cost, may not necessarily result in better overall corporate performance, especially if the goals of the supply chain are not aligned with the strategy of the business.
- **Strong focus on execution.** This supply chain is focused on implementing decisions made elsewhere in the firm, without having any input or effect on those decisions.
- **Speaks a language that is very functionally oriented.** Current supply chain managers speak their own language, one that is rooted in terms like capacity, throughput, bottlenecks, inventory and ppm. This

language hinders the ability of current supply chain managers to effectively interface with the other functions of the firm and with top managers who measure performance in different ways.

- **Strives to simplify and avoid complexity.** In the traditional supply chain, complexity is seen as something that adds cost and lead-time and must be resisted whenever possible.
- **Deliberate decision-making.** The traditional supply chain manager believes that it takes time to make decisions. Haste makes waste.
- **Optimal solutions are the best.** There is something “optimal” about an optimal solution.
- **Stability.** It is highly valued.
- **Toolsmiths.** Many current supply chain leaders are well grounded in solutions that they can quickly apply to any situation or problem. They are masters of ERP, MRP, DDMRP, Six Sigma, Total Quality Management (TQM), Theory of Constraints (TOC) and Lean/Just-in-time.

What we have here is a broad brushed view of the typical supply chain manager. But while these traits might help get things done, they are not the traits needed by leaders of the new strategic supply chain.

The emerging supply chain leader: Strategic in focus; outside/in in orientation

The emerging supply chain leader—such as those we encountered in the “Beyond the Horizon” project and the one hinted at in the Deloitte supply chain survey—has a very different set of skills and orientations, namely those outlined below.

- **Excels at managing at the interfaces.** The new supply chain leader recognizes the need to work with other functions within the firm. Specifically, they must be prepared to engage with groups such as engineering, marketing, finance, accounting and top management. This engagement is bi-directional. On one hand, they need to understand the requirements of these other groups because their needs have to be translated into capabilities that the supply chain must provide. On the other hand, the new supply chain leader must be prepared to educate these other groups on the capabilities of the supply chain—what the supply chain can and cannot do. They must also be able to communicate how actions taken by these other groups affect the performance of the supply chain. For

example, they must be able to show how promotions can adversely affect the ability of the supply chain to ensure that there is adequate stock on the shelf once the promotion becomes active. If a change in supply chain capabilities is required, then it is the responsibility of the new supply chain leader to communicate to the other areas how long it will take and what it will cost. In other words, the new supply chain leader must excel at educating, informing and coordinating.

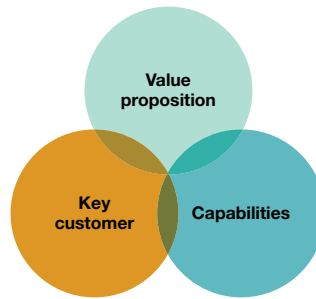
- **Focus on asking the “right” question, rather than on the “right” solution.** This is where critical thinking shines. As Charles F. Kettering, the brilliant designer and engineer at General Motors, once said: “A problem well stated is a problem half solved.” Here, the supply chain leader is more interested in ensuring that there is a clear and concise understanding of the desired outcome, rather than focusing on a specific solution. This means ensuring that everyone understands what the goal is, and then soliciting the input of the various members of the supply chain to identify how best to achieve this goal. The solution becomes secondary to the desired outcome because it is driven by this outcome.
- **Strives for business excellence, rather than supply chain excellence.** Here, the goal is to help the firm better compete at the business model rather than the supply chain level. The business model, which can be viewed as a highly operational restatement of the strategy (see Figure 2), identifies three critical components that must be consistently maintained in alignment for the firm to compete:
 - **The key customer.** The customer is the ultimate judge of what is produced. Here, the new supply chain leader must identify who it is that the firm is specifically targeting—whose needs will it try to profitably satisfy.
 - **The value proposition.** This is what the firm offers to attract and retain key customers.
 - **Capabilities.** These are the resources, skills, processes and assets that the firm draws on to deliver the value proposition that is expected by its key customers. It is here that the supply chain resides, along with corporate processes, measurement, capacity and corporate culture. The new supply chain

leader understands that it is their task to ensure that what the key customers expect, what the firm has promised and what the supply chain can deliver are continuously in alignment over time.

Outside/in as compared to inside/out. A strategic supply chain manager views the capabilities of the supply chain through a different lens. The traditional lens is from the inside/ out, where the leader understands what the supply chain can and cannot do and tries to convince key customers that this is what they really want. The new, strategic lens is from the outside/in: It looks at what the key customers want and what type of

outcomes they wish to achieve. These new leaders understand that it is these key customers who drive the firm, its strategy and ultimately the supply chain. This identification with key customers takes its most immediate form in terms of how communication is implemented—through measures and metrics.

FIGURE 2
The business model



Source: Deloitte

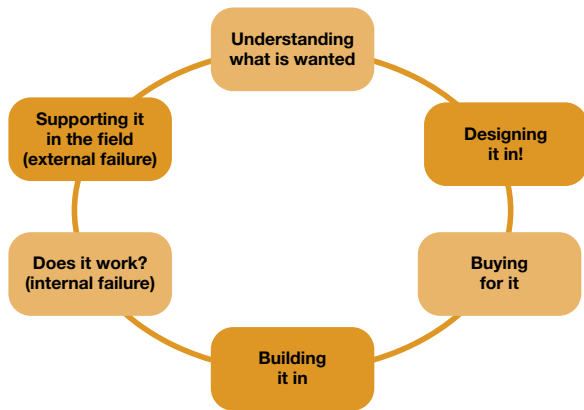


The new supply chain leader must be prepared to educate these other groups on the capabilities of the supply chain—what the supply chain can and cannot do.

Effective at communicating with others in terms of performance measurement, measures and metrics. To effectively communicate within the firm, the new supply chain leader must recognize the importance of measures and metrics as communication. Measures and metrics, as noted by management experts Joan Magretta and Nan Stone, restate the business strategy and the business model into what each group or person must do to achieve this strategy. Increasingly, we are recognizing that effective communication within the firm occurs at this level, not in terms of measures such as capacity, throughput and utilization. The new supply chain leader uses these measures to show how the actions of the supply chain can affect how others perform. Furthermore, in many cases, the new supply chain leader takes this emphasis on per-

formance to a new level by adopting the customers' own measures as their own. When this occurs, communication is immediately enhanced between the supply chain and the customer because both are using the same set of measures. More importantly, supply chain impact can be seen immediately because these actions can be translated into how they affect the performance of the customer. Because

FIGURE 3
Cost of complexity: a total cost approach



Source: Deloitte

both parties are using the same numbers (so to speak), the opportunity for conflict is minimized.

Recognizes the need for complexity but still strives to identify and eliminate complications. Because the new supply chain leader closely knows and identifies with the key customer, there is an acceptance of the need for complexity. Complexity is a trait that comes from the key customer and is something that the supply chain must be able to accommodate. The leader does try to communicate the downside risks of complexity through a cost of complexity approach (see Figure 3). However, the leader is able to differentiate between complexity, which comes from the customer, and a complication, which occurs because of the actions of people within the supply chain.

As an example of a complication, consider the following situation. A firm has a short-term quality problem with a component supplier. To address the immediate issue, it modifies its manufacturing process to include an inspection activity. The problem is eventually addressed but the inspection is not removed. This inspection is an example of a complication—something that plagues most supply chain systems. The new supply chain leader may

have a purpose to add complications, such as increasing the number of backup suppliers, but these actions are often driven by the need to protect the system from disruptions and to improve resilience.

Recognizes and accepts the presence of uncertainty and change. Uncertainty is viewed as the natural state of things when it comes to making a decision. After all, you never have enough time; the information is never complete or sufficiently accurate; and something is always changing before you make your decision.

Strives for robust rather than optimal systems. Optimality is nice. However, in many cases, optimality results in fragile systems. That is, as long as things have not changed from the conditions that were used to derive the optimal solution, all is well. However, as soon as something changes in the environment, the optimal system sputters. Instead, the goal should be a robust system, one that may not generate optimal performance but is able to respond to changes without extracting a severe penalty in performance. Robust systems are the natural complement to the preceding trait.

The focus is on the future. In this new environment of change and uncertainty, the past is viewed as a lesson to be learned, and not as the basis for punishment. As one manager in the “Beyond the Horizon” project put it: “The past is something you cannot do anything about. Learn from it; get over it; focus rather on the future.” That is the attitude assumed by the new supply chain leader. This focus and concern about the past is also reflected in planning. The new supply chain leader recognizes the importance of that basic supply chain dictum—today’s supply chain is the result of investments made in the past; tomorrow’s supply chain will be the result of investments made today.

Fast decision making is the key. In this environment, you do not have the time to wait until changes shake out. Rather, you have to make decisions quickly and be willing to live with the fact that you will be wrong on occasion. This is becoming the natural state of affairs. As one manager put it: “You make decisions quickly, you fail fast, you learn quickly, you move on.” This was best illustrated during the “Beyond the Horizon” project by one interview that took place at a fast fashion goods operation located in the Midwest. The manager who was leading research team members on a plant tour stopped to point out a new \$1.7 million line. He asked the research team to guess how long

it took to go from problem awareness to the time that this line was up and running. The team members answered with numbers ranging from two to three years. The answer: Seven months. When questioned, he brought out the key lesson: If the company had waited to make sure that the issue driving the need for the investment was real, it would have been too late. A new, faster method of decision-making is demanded.

The challenge

The evidence, as summarized in Table 1 is clear. While there will always be a demand for tacticians and fire fighters, the new strategic supply chain needs a different type of leader, perhaps a Chief Supply Chain Officer (CSCO) who is well prepared by skills, temperament and preparation to sit at the same table as the CEO, CIO, the CFO and other similar leaders.

And that is where the real talent crisis lies. That is because generators of the current supply chain talent, such as professional societies like APICS, ISM, CSCMP, firms and educational institutes at the community college, college and university levels, are for the most part structured and organized to deliver the traditional supply chain manager. Their focus is on tools and content.

While those are important, they are not enough—they can be viewed as the cost of playing the game. What makes future supply chain leaders so different are their thought processes and approaches. They are coordinators and orchestrators; they educate and communicate; they see the supply chain not as capacity but as capabilities (what the supply chain can do well and what it does poorly); they focus on the desired outcomes rather than on the solutions.

Finally, they recognize that ultimately the supply chain is strategic, not because it is the best example of Lean or Total Quality Management, but because it supports the firm's value proposition and helps the key customers succeed. The challenge for the current generators of supply chain talent is to develop a system that can create such

TABLE 1


Comparing supply chain leaders

Traits	Traditional supply chain manager	Strategic supply chain leader
Orientation	Functional; strongly internal	Cross-boundary; coordination
Performance stance	Cost/cost minimization	Outcome-driven/revenue maximization
Definition of excellence	Supply chain excellence	Business excellence
Stance	Focus on execution	Asking the right question Making sure the desired outcome is understood and made inevitable
Dealing with the customer	Inside/out	Outside/in
Communication	Very functionally oriented Capacity, throughput, bottlenecks, inventory, ppm	Performance measures and metrics Use the customer's metrics as ours.
Complexity	Strives to eliminate or simplify complexity	Accepts complexity as a fact of life that must be master. Strives to elimination unnecessary complications.
Uncertainty	Desires stability; manage change	Accepts uncertainty and change
Decision-making style	Deliberate	Fast decision-making
Desired types of solutions	Optimal	Robust
Overall stance	Toolsmiths—masters of tools	Problem masters—define the problem that the rest of the supply chain will focus on.

Source: Deloitte

leaders. However, for those firms and organizations that can meet this challenge, the future is indeed bright.

About “Supply Chain Management: Beyond the Horizon”

“Strategic Supply Chain: Beyond the Horizon” (SSC:BTH) is a long-term project aimed at identifying and exploring emerging issues in supply chain management both domestically and internationally. This project, jointly sponsored by department of supply chain management, the Eli Broad School of Business and APICS, has over a three-year span studied over 60 leading supply chain management organizations. The results and insights obtained from this project have been fine-tuned and tested in a series of focused workshops. This project has been led by David Closs and Pat Daugherty of the Department of Supply Chain Management at Michigan State University. 



THE customer- centric supply chain

BY STEVEN A. MELNYK
AND DANIEL J. STANTON

Steven A. Melnyk is a frequent contributor to Supply Chain Management Review, a professor of supply chain management at Michigan State University and the Newcastle Global Innovation Chair in Supply Chain Management at the University of Newcastle in Newcastle, Australia. He can be reached at melnyk@broad.msu.edu. Daniel J. Stanton is president of SecureMarking and associate professor of Operations Management at the Jack Welch Management Institute. He is also a research affiliate at Cranfield School of Management (UK). He can be reached at daniel@danieldstanton.com.

The importance of dissolving the “wall” between the customer and the supply chain.

THE AMERICAN MIDWEST is home base for a company that manufactures industrial equipment. Its customers include engineers, designers and maintenance personnel. In the past, the relationship between the customer and the supply chain ran through marketing—the customer talked to marketing and if the information communicated from the customer involved changes to orders, these changes were communicated to supply chain through the sales and operations planning system (S&OP) and the master production schedule (MPS). This relationship was not that unusual: marketing worked with the customer; the planning system coordinated activities; supply chain worked to the schedule. No need for supply chain to talk to—or even know anything about—the customer.





The problem, however, was that this system was not working. It took too long for changes and requests to work their way to the supply chain. Even when they were communicated, the changes were often distorted as marketing added their “spin” to the information. Even worse, the supply chain and the customer were not even aligned. The supply chain focused on cost and meeting the schedule; the customer often wanted respon-

Due to a perfect storm of forces including changes in the market, changes within the customer base, changes in technology and changes within the supply chain itself, companies are discovering the power of having supply chains where there is direct contact with key customers.

siveness and flexibility. Ultimately, customers became frustrated; supply chain personnel became confused (if we met the plan then why was the customer upset); and top management was concerned with competitive pressure increasing and long-term customers buying from the competition. In response to these developments, top management formulated a radical solution: Cut out the middleman. Instead of the conversation beginning with marketing, supply chain would get to know the customers up close and in person; supply chain would focus on those things that customers wanted (and would be willing to pay for).

The new system delivered unexpected results. Customers now began to see the firm in a far more positive light relative to the competition. In addition to strengthening their brand, they discovered that customer complaints dropped, lead times fell and performance improved. For the first time, the supply chain team was able to align its goals with their customers’ needs because they understood whom they were serving from first-hand experience. When there was a problem, the supply chain team had a new perspective on the issues, and could think more creatively about how best to resolve them. Unlike in the past, cost was no longer the primary driver. Ultimately, the company had discovered the power of the customer-centric supply chain.

That firm is not alone. The conventional wisdom that supply chain should focus on fighting fires and reducing costs is now being challenged. Due to a perfect storm of forces including changes in the market, changes within the customer base, changes in technology and changes within the supply chain itself, companies are discovering the power of having supply chains where there is direct contact with key customers. In this article, we explore these changes, their implications for supply change management and their implications for managers—both within the supply chain and within the firm. The wall between the customer and the supply chain is coming down and things will change.

Welcome to the customer-centric supply chain

So, what is the customer-centric supply chain? We define it as a supply chain where managers know their key customers, where they work closely with these key customers and where the supply chain is structured to meet the ever-changing needs of those customers.

Such supply chains are increasingly becoming a feature of the strategic supply chain of the 21st century. Its presence was observed in the recently completed “Supply Chain Management: Beyond the Horizon”—a three-year project, jointly sponsored by the Department of Supply Chain Management at Michigan State University and APICS, that focused on identifying the developments that will affect the supply chain of the future (for more information, see the description found at the end of this article). One of the findings involved the increasing importance of the customer to the new supply chain.

In a recent article in *Forbes*, SCM World’s Kevin O’Marah contended that the supply chain should be aligned with the desired outcomes prized by the key customers and the strategic promises made by the firm, as contained within the value proposition. In another recent publication, KPMG recognized the critical and increasingly important role played by the customer in the supply chain.

Like many things that have emerged in supply chain management, the customer-centric supply chain is the result of the convergence of major forces. We have identified five: (1) the emergence of the strategic supply chain with its integration in the corporate's business model; (2) the Amazon effect; (3) changes in the customer base; (4) changes in technology; and, (5) changes taking place in the supply chain.

What does it all mean? This paper is driven by a very simple premise: If the supply chain is to be strategic and if it is to be effective (i.e., excel at doing the right things rather than doing things right), then it must become customer-centric—any other position is inconsistent with the notion of the strategic supply chain. Therefore, it makes sense to start our discussion of the customer-centric supply chain with the business model.

The customer-centric supply chain: The role of the business model

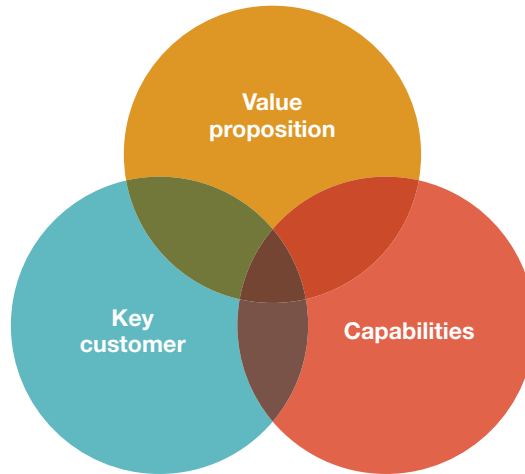
There is much discussion today of the strategic supply chain—unfortunately most of it takes place without telling the reader what exactly is meant by the term. We have a very specific definition of the strategic supply chain: It is a chain that is integrated into, supportive of and aligned with the firm's operating business model; it is a supply chain where the focus is on business, not supply chain excellence. When we link supply chain to the business model, which operationally defines corporate strategy and objectives, we make the supply chain inherently strategic.

The business model (see Figure 1) identifies three critical components that must be consistently maintained in alignment for the firm to compete.

- **The key customer.** The customer is the ultimate judge of what is produced. What is important about this component is that the business model recognizes that while all customers are important, some customers are more important than others. These become the key customers.
- **The value proposition.** This is what the firm offers to attract and retain key customers.
- **Capabilities.** These are the resources, skills,

FIGURE 1

The business model



Source: The authors

processes and assets that the firm draws on to deliver the value proposition. The supply chain resides here, along with corporate processes, measurement, capacity and corporate culture.

The business model strives to ensure consistent alignment between the three elements—what the key customer expects, what the firm has promised (the value proposition) and what can be delivered (capabilities). Two points must be made. First, maintaining this alignment is no easy task given that most firms are operating in environments characterized by aggressive competitive forces, changing technology and government actions that are often difficult to predict. Second, and important from the perspective of this article, the business model demands that the supply chain know who the key customers are, what they want (recognizing that not all outcomes are equally important) and how they will use the outputs generated by the supply chain. Simply put, you cannot be strategic without knowing who your key customer is.

The Amazon effect

Amazon is a modern retail juggernaut. Since its founding in 1998, Amazon has grown from being simply an on-line bookstore to a one-stop omni-channel retailer for everything from furniture to

food to streaming entertainment services. In addition to a global footprint, Amazon has also expanded successfully into Cloud computing and storage. More importantly, it has changed how customers shop and what they expect—regardless of whether the customers are end users or a business. These changes are most evident in the following areas.

- **24/7 customer service.** Amazon's customer service is always available by various means—online chats, telephone or e-mail. In addition, Amazon service is very accommodating with customers.
- **Easy to place orders.** A second area where Amazon has developed a unique reputation with its customers is the ease with which orders can be placed. Once you set up your account, establish the method of payment and allow one click shopping, then all that you have to do is click on the place order button and your order is placed.
- **Continuous flow of information about the order.** Once an order has been placed, Amazon continuously communicates with the customer regarding the status of the order (it has shipped, it will arrive by such a date). There is continuous visibility regarding the order.
- **A relentless focus on improving customer service.** Amazon realizes that its customers want prod-

One result of this change in customer base is the increased importance of supply chain visibility. Visibility, something previously demanded by the corporate buyer as a way of dealing with supply chain risk, is expected by the new consumer.

ucts that are priced fairly but delivered quickly (and are willing to pay for it). Consequently, Amazon is always searching for and experimenting with new ways of reducing delivery lead times when the customer needs the product now. Amazon Echo, experimenting with drone deliveries and the use of bicycle messengers and Uber carriers for product delivery are examples of this relentless focus on improving customer service.

- **An informed buying process.** When you buy from Amazon, you are faced with customer

reviews and alternative/complementary products. You are also given the option of buying from non-Amazon sources.

- **A trusted source.** Ultimately, with Amazon, you get a good price, although it is not always the lowest. However, what you also get is access to a source that you trust and that you know will honor its sales.
- **Reliable deliveries.** Amazon Prime customers know that their orders will be delivered in two days—free. And, if you want next day delivery, it's extra. The result is one of the most predictable delivery systems in the retail market. This trait has also helped to set customer expectations for delivery—no more than four business days from the time an order is placed.
- **Easiest return process.** Finally, no one offers an easier return policy. If you don't want a product, simply go on line, click on the order placed and then indicate the item that you wish to return. After recording the reason for the return, Amazon sends a preprinted, prepaid UPS label. More importantly, your money (less shipping) is credited back to your account when the package has been scanned as received by the UPS pickup service.

These various attributes have not only shaped how customers view their interactions with Amazon but also their interactions with other companies. For example, at the 2015 Supply Chain Outlook Summit conference, sponsored by *Supply Chain Management Review*, one of the participants—a manufacturer of automation equipment—observed that his customers were now demanding the same things that Amazon was offering: full information, reliable deliveries and 24/7 service. The Amazon effect is real and it is changing what customers expect from supply chain management.

Changes in the customer base

Writing in *Forbes*, Micah Solomon noted that a major marketing change took place in 2015—the Millennial customer, born between 1982 and 2004, replaced the Baby Boomers as the key consumers. Numbering about 80 million, Millennials now

make up over 25% of the U.S. population. More importantly, unlike Baby Boomers, this generation is growing in size. Millennials are fundamentally different from baby boomers in their demands and these demands are directly affecting and shaping the supply chain. Consider the following:

- **The customer is the star.** Millennials expect the buying and shopping experience to be focused on them. They want the marketing experience to differentiate between buying (a regular activity that involves fairly standard products) and shopping (where the act of identifying the product to be delivered is critical).
- **They crave a true, authentic personalized experience as customers.** Shopping is important to these consumers. They want to be involved in the design and delivery of the product. They don't want a transaction; they want an experience. That is why we see the rise of providers such as Blue Apron, Fresh Now and M-Tailor. In these experiences, the supply chain is highly visible and the buying experience highly personalized.
- **They care about your company's values.**
- **They expect your technology to work.**
- **They want to collaborate and co-create with your brand.**
- **Convenience and speed are key.** They want systems with which placing orders is easy—and speed, not cost, is king.

One result of this change in customer base is the increased importance of supply chain visibility. Visibility, something previously demanded by the corporate buyer as a way of dealing with supply chain risk, is expected by the new consumer. As one senior Starbucks executive noted on a PBS special about coffee: "Today's consumers increasingly want to know about the provenance of the products that they consume."

Changes in technology

Technology has always played a major role in supply chain management, whether it was computers and MRP planning of the 1970s and 1980s or robotics and the Internet. Yet, the technology that promises to bring the supply chain closer

to the customer is the Internet of Things (IoT). IoT refers to the network of physical objects, or "things," that are embedded with software, sensors and network connectivity that enable the collection, exchange, analysis and communication of data in real time. IoT includes smartphones, sensors in cars, equipment, appliances, fitness monitors, smart watches and product tags. To get an idea of the impact of IoT, consider the follow-

Both researchers and practitioners have long realized that a simple, small change in a customer order becomes amplified as it moves through the various components of the supply chain.

ing: By 2020, it is estimated that there will be over 201 billion such devices. Along with RFID, improved analytics and social media, what IoT brings to both the supply chain and the market is: (1) the improved ability to quickly sense and seize opportunities taking place on both the supply and demand sides, and, (2) the ability to offer the market new services that are derived from this sensing and seizing capability.

The first opportunity was recognized in a 2017 SCM World Report on the digital supply chain. With IoT, the authors noted, smart sensors can now be embedded in products to quickly identify how customers use these products and more importantly to flag potential faults in the products—flaws that by themselves and occurring in isolation may seem random but are indicative of systematic problems in the products when aggregated. This allows supply chain managers to get out in front of potential problems.

This is exactly what the tire manufacturer Pirelli has done with its Connesso tire, an integrated tire and software platform that collects information about the condition and use of tires. This information is then relayed to the Pirelli Cloud for storage and analysis. The data can be used to help Pirelli flag the presence of any potential design flaws. Simultaneously, Pirelli is able to offer its customers a new service based on this sensing capability. Using an app, drivers can now access real-time performance information.

If there is a problem, the app directs the driver toward the closest available repair shop where the tire can be fixed or replaced. And, the app can automatically book an appointment with the shop. In this example, we see the two capabilities offered by the new technology in action.

However, there are two important impacts.

There is now a direct relationship between the customer and supply chain management. However, this new relationship brings with it certain key implications for both the supply chain manager and for corporate management overall.

First, these new technologies enable organizations to quickly identify (sense) changes both in supply and demand, often without relying on other organizations to participate. Second, and more important, these developments short-circuit the “bullwhip” effect that has persistently plagued the supply chain manager.

Both researchers and practitioners have long realized that a simple, small change in a customer order becomes amplified as it moves through the various components of the supply chain. More importantly, as the order moves through the system, it consumes time (thus delaying responsiveness) and the information becomes distorted. Consequently, what’s received is dated and you can’t be sure whether you are dealing with actual customer issues or are seeing the impact of the actions of the various parties downstream. This changes with the new technology. Information that took weeks to become available to supply chain managers can now become available in days; information that was corrupted now clearly reflects what is actually taking place in either the supply or customer spaces.

The challenge for supply chain managers in this new world is two-fold. First, to reduce the time from the moment that this information is collected until that information is made available to the supply chain manager. This means addressing the extent to which the firm’s own planning system is a source of delay as the various systems

interface with each other. The second is to shift from deliberate management to fast management—from waiting until all of the information is in and then acting after thorough analysis, to acting quickly on the basis of incomplete and changing information (recognizing that you will be wrong some of the time but that your supply chain has sufficient robustness to absorb any errors created by “wrong decisions” and that the costs of waiting until you are certain outweigh the costs of acting quickly).

One computer company experienced first-hand the power of this new technology. Previously, it took between 45 days to 80 days for the company to become aware of problems involving its personal computers. Even then, the information could not be trusted. By reviewing social media comments, review boards and other comments posted by the customers of its newly released personal computer, it was able to identify a design/quality problem in its power adapter within five days.

Before leaving this discussion, we should note that the visibility created by these new technologies into both the demand and supply spaces is not only critical to the supply chain manager, it is also being increasingly demanded by the customers who want to know more about the products they use and consume.

To drive home this point, consider how several leading automakers responded to a recent revelation by the *Guardian*. In 2016, the British newspaper published an article that linked the supply chains of some of the largest European automakers to illegal mines in India where child labor and debt bondage was widespread. In fact, according to this article, children as young as 10 years old were being used to extract and sort mica—the mineral that made car paint shimmer. This was dangerous, hard labor. In many cases, the children were working at the mines rather than going to school because their families needed the money.

Three Indian exporters—Mohan Mica, Pravin and Mount Hill—seemed to be the major transgressors. These companies, in turn, sold their raw materials to customers such as Fujian Kancai, a

FIGURE 2

Traditional relationships



Source: The authors

company whose customers included cosmetics giant L-Oreal, P&G, PPG and Axalta (the last two customers are leading car paint suppliers in a \$19 billion world car paint market). In response to the *Guardian* article, Vauxhall (part of the GM group), BMW and Volkswagen launched investigations into their paint supply chains, because this finding, if supported, is against company policies that prohibit such practices.

Why did these carmakers respond as they did? Because they knew that these practices mattered to their customers. They also realized that they were responsible not only for their actions, but also for the actions of their supply chains. Ignorance was no longer acceptable.

The new manager

If these prior four factors were not enough, there is evidence emerging that supply chain managers themselves are recognizing the need to become customer centric, according to data generated from the Beyond the Horizon research project. After talking with manag-

ers from over 60 leading supply chain management systems, the research team began to realize that a critical test of the effectiveness of the supply chain was the extent to which the supply chain and its management was customer centric. This test focused on performance measurement.

Specifically, those supply chain managers that used their key customers' key measures as their own seemed to continuously excel in performance. The epiphany for this came out of an interview

with the top management team of a Midwestern manufacturing and design company. As presented by the vice president of supply chain management, prior to this change, meetings with the firm's key customers were often contentious and drawn-out affairs.

Each company came to the meeting armed with their measures (that often did not align). Consequently, the first two hours of every meeting were devoted to deciding on which measures to use and how to "translate" between the various measures. The meetings went downhill from there. This all changed when the supplier hired a new, more strategic head of supply chain management.

One of the first actions taken was to use their key customer's measures as their own measures. While initially greeted with surprise, people began to see the benefits offered by this approach. First, meetings with customers became shorter and less contentious. Gone were the two hours needed to decide whose measures to use. Second, the supplier began to recognize

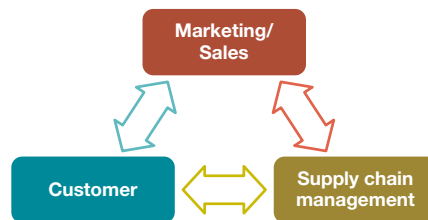
what constituted value for its customer—it was anything that caused the customer's key measures to go up. The supplier began to build a strong case for why working with them was not simply good for costs; it was also good for them. By the way, it goes without saying that this approach works best when the customer's measures align with the firm's value proposition and

strategic statement. When this alignment fails to occur, there are problems. This led to an interesting observation about supply chain management in the 21st century: Previously, good customers could fire bad suppliers; in today's environment, good suppliers can and do fire bad customers.

Another innovation involving managers is that for the supply chain to be truly customer centric, its personnel had to think of the key customer not as a market segment, but as an actual person. This point

FIGURE 3

Customer-centric relationships



Source: The authors

was driven home in an interview with a manufacturer of inexpensive bicycles that were sold through large retailers such as Meijers, Toys R Us and Walmart. Previously, the manufacturer had thought that its key customers were parents and children. This focus turned out to be wrong. Parents bought their bikes based on availability and not on brand recognition. Availability, in turn, was influenced by two specific people working within the customers' organizations: the store manager and the purchasing agent. So, the managers goals became to make it easy for them to place orders and for the sales to be profitable. With this change in orientation, the bike manufacturer's sales increased.

The business landscape is changing quickly. New business models, changes in the customer base, the powerful Amazon effect, new technologies and changes in the supply chain itself are all forces that need to be addressed strategically.

Finally, supply chain managers have recognized that they are the prime determinant of Moments of Truth (MOT) in their companies, a concept first proposed by Jan Carlzon, the former CEO of SAS Airlines. Carlzon noticed that the customers' views of the company serving them were strongly influenced by their last direct interaction, or Moment of Truth, with that company. They were strongly influenced by factors such as the frontline personnel, inventory and capacity—factors under the control of the supply chain. His goal was that every MOT should enhance the airline's reputation with its customers. If that is the goal (it appears to be so given the factors discussed under the change in customers), then the supply chain by definition must become customer centric. When the supply chain misses a delivery, the result is a negative MOT; when a delivery driver goes out of his or her way to ensure that an order is delivered on time and with quality, that is a positive MOT.

From straight lines to triangles: Implications of the customer-centric supply chain

In the past, our relationship with our customers was a straight-line relationship similar to that found in Figure 2.

The new relationship at the heart of the customer centric supply chain is illustrated in Figure 3—a triangle. There is now a direct relationship between the customer and supply chain management. However, this new relationship brings with it certain key implications for both the supply chain manager and for corporate management overall. These include the increasing need for fast management, acceptance of the “preferred status” as the new black and the need to embrace the new realities of the customer-centric supply chain.

Fast management

Managers must now manage fast rather than manage deliberately—a fact that was first realized during the Korean War. Then, the U.S. military was shocked by the losses suffered in air-to-air combat. Advances in technology from propellers to jet fighters, combined with the best pilot training system in the world, should have given the U.S. Air Force a huge advantage over its adversaries. Yet, the Air Force found that pilot mortality was distinctly bimodal in distribution—with many pilots being shot within days of their introduction to combat. To understand this situation, the Air Force brought in one of the best “out-of-the-box” thinkers—Colonel John R. Boyd. After reviewing the data, he determined that the reason for many new pilots being shot down lay in their decision-making process, which was too deliberate. That is, they waited until they were sure that they were facing an enemy. With closure speeds in excess of 1300 mph, pilots were left with little if any reaction time. By waiting, they became victims, not victors. Boyd realized that jet propulsion technology had changed the rules of air-to-air combat. Pilots needed to make faster decisions, with less information. So, the Air Force began training pilots to make decisions using the OODA loop procedure—a four step cycle, consisting of Observe, Orient, Decide and Act—to guide their decision making.

The same thing is happening in supply chains. Technology gives us the capability to see further and faster. Supply chain managers need the equivalent

of an OODA loop to take advantage of new technologies and make decisions at the new speed of business. This new strategic response cycle consists of the following steps: **(1)** sense (the threats/developments); **(2)** assess (are these developments important now or in the future); **(3)** formulate (a response); **(4)** deploy (the response); **(5)** evaluate (did the response work?); **(6)** recalibrate (are our original goals still appropriate or do they have to be re-evaluated?); **(7)** learn (by asking: What went wrong? What went right? What was missing?); and, **(8)** repeat. In today's world, the coin of the realm is management by speed, not by cost reduction.

Preferred status is the new black

Today's key to success is achieving "P" status, or "preferred" status. For customers, this means that they are viewed as the preferred customer by their suppliers; for suppliers, this means that they are viewed as the preferred supplier by their customers. In practical terms, this means that whenever a customer has a need to meet, they will consider you first.

Achieving "P" status provides a strategic advantage, even in an environment where customers have many choices in suppliers. If you understand what has the greatest value to your key customers, and if you align your supply chain to these metrics, then you will be in the best position to grow the preferred status relationship—increasing top line revenue and increasing market share. This is the lesson that Amazon has painfully taught its many competitors—because it is the "P" supplier to many of its customers, these customers always turn to Amazon when they have a need to fill.

Embrace the change

While many firms will choose to ignore these developments and continue to do business as usual, other firms—and managers—will embrace the change. The latter will flourish as they discover new ways to better serve their key customers. For the former, survival will be more problematic. For these firms, we offer the advice given by W. Edward

Deming when he was confronted by a Board from a large multi-national that wanted to know if they had to do everything that Dr. Deming recommended regarding Total Quality Management: "No, you don't have to do everything that was recommended. Survival, after all, is not mandatory."

The brave new world of the customer-centric supply chain

The business landscape is changing quickly. New business models, changes in the customer base, the powerful Amazon effect, new technologies and changes in the supply chain itself are all forces that need to be addressed strategically.

Adapting to these changes will require companies to implement strategic, customer-centric supply chains. To enable this transformation, companies must first identify their key customers, and then structure their organizations so that the supply chain team is side-by-side with sales and marketing in building and managing those relationships. When faced with decisions and trade-offs, the key question should always be "what would make us the 'P' supplier for this key customer?"

Deming's admonition is not just directed at firms: The brave new world of the customer-centric supply chain will require supply chain managers to embrace the change, drive it in their organizations and learn to manage with their customers in mind rather than focusing strictly on costs. ☺☺

About Supply Chain Management: Beyond the Horizon

Strategic Supply Chain: Beyond the Horizon (SSC:BTH) is a long-term project aimed at identifying and exploring emerging issues in supply chain management both domestically and internationally. This project, jointly sponsored by Department of Supply Chain Management, the Eli Broad School of Business and APICs, has over a three-year span studied over 60 leading supply chain management organizations. The results and insights obtained from this project have been fine-tuned and tested in a series of focused workshops. This project has been led by David Closs and Pat Daugherty of the Department of Supply Chain Management at Michigan State University.

COMPANY PROFILES

The following Company Profiles offer important insight from top-level companies. Read through these pages and see all of the new opportunities that are being offered to help improve your company's supply chain and keep costs in check.



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Executive Guide to **Supply Chain** **Resources**



Transportation/ Logistics Services



The following is a representative sample; it is not intended to be an exhaustive listing of all the companies in this category.



AIRFREIGHT SERVICES



Purolator International

2 Jericho Plaza
Jericho, New York 11753
888-511-4811
Email: wedelivercanada@purolator.com
purolatorinternational.com

About: Purolator International is a subsidiary of Purolator Inc., a leading integrated freight, package and logistics solutions provider in Canada. Purolator International specializes in the air and surface forwarding of Express, Freight and Parcel shipments, customs brokerage, and fulfillment and delivery services to, from and within North America. For more information: 888-511-4811, option 3 or email: wedelivercanada@purolator.com



Team Worldwide

P. O. Box 668
Winnsboro, Texas 75494
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Toll Free: 800-527-1168
Fax: 903-342-3764
Email: info@teamww.com
teamww.com

About: With over 40 U.S. offices, and 170 TIGA locations, Team Worldwide provides global transportation of logistics services organized under the operating companies/services of:

- Team Air Express
- Team Transportation

- Team Logistics
- Team Ocean Services
- Team Customs Brokerage
- Team International Trade Services
- Team International Global Alliance



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300 Lighting Way
6th Floor
Secaucus, New Jersey 07094
201-553-3800
Toll Free: 800-414-3895
Email: marketing@us.yusen-logistics.com
yusen-logistics.com

About: Yusen Logistics is leading global logistics service provider with over 60 years of expertise in warehousing, freight forwarding, and transportation. With more than 20,000 employees and 475 offices worldwide, we provide services to customers across Asia, Europe, North and South America, and Oceania.

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800-688-2274
aircanada.com/cargo/en

Air France KLM Cargo

800-556-9000
afklcargo.com

AirFreight.Com

800-486-3780
airfreight.com

American Airlines Cargo

817-355-6800
aacargo.com

Associated Global Systems

516-627-8910
agsystems.com

Cargolux Airlines International S.A.

561-988-1868
cargolux.com

Cathay Pacific Cargo

800-628-6960
cathaypacificcargo.com

Clean Energy Fuels

4675 MacArthur Ct
Newport Beach, California
949-437-1000
cleanenergyfuels.com

Columbus Regional Airport Authority

4600 International Gateway
Columbus, Ohio 43219
614-239-4000
columbusairports.com

DHL

logistics.dhl

Eva Air Cargo

718-995-5220
evaair.com

FedEx Express

800-463-3339
fedex.com/us

JAL Cargo

718-656-9801

K.W.E. Global Logistics
800-275-4045

Korean Air Cargo
1-718-632-5555
cargo.koreanair.com

Kuehne + Nagel, Inc.
201-413-5500
kuehne-nagel.com

Lufthansa Cargo
lufthansa-cargo.com

Lynden International
lynden.com/lint

MIQ Logistics
11501 Outlook Street
Suite 500
Overland Park, Kansas 66211
913-696-7100
Toll Free: 877-232-1845
Email: contact_us@miq.com
miq.com

Mode Transportation
1 (972) 447-0075
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Nippon Cargo Airlines
907-266-2525
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Panalpina Inc.
305-894-1300
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Purolator International
888-511-4811
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Singapore Airlines Cargo
718-656-1010

Southwest Airlines Cargo
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Span Alaska
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United Cargo
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UPS Air Cargo
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MOTOR CARRIERS



Landstar System, Inc.
13410 Sutton Park Drive South
Jacksonville Florida 32224
United States
904-398-9400
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Email: solutions@landstar.com
Web: landstar.com

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P. O. Box 668
Winnboro, Texas 75494
903-342-3516
Toll Free: 800-527-1168
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Yusen Logistics Americas Inc.
300 Lighting Way
6th Floor
Secaucus, New Jersey 07094
201-553-3800
Toll Free: 800-414-3895
Email: marketing@us.yusen-logistics.com
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American Fast Freight

americanfast.com

ARC Best Corporation

arcb.com

Averitt Express

averittexpress.com

Cargomatic

cargomatic.com

Clean Energy Fuels

4675 MacArthur Ct
Newport Beach, California
949-437-1000
cleanenergyfuels.com

Crete Carrier Corp.

402-479-2000
cretecarrier.com

CRST International, Inc.

319-396-4000
crst.com

Dayton Freight Lines, Inc.

6450 Poe Ave.
Dayton, Ohio 45414
937-264-4060
Toll Free: 800-860-5102
Fax: 937-264-4079
Email: customerservice@dayton-
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daytonfreight.com

DB Schenker

516-377-3000
dbschenkerusa.com

Echo Global Logistics

585-427-2080
echo.com

Estes Express Lines

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estes-express.com

Express America Trucking

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expressamericatrucking.com

FedEx Freight

800-393-4585
fedex.com/us/freight

Heartland Express Inc.

319-545-2728
heartlandexpress.com

Holland

616-395-5000
hollandregional.com

J.B. Hunt Transport Services, Inc.

jbhunt.com

Kane is Able, Inc.

kaneisable.com

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landstar.com

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NFI Industries

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Saia Inc.

1 (800) 765-7242
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Schneider Logistics, Inc.

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schneider.com

Schneider National, Inc.

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Southeastern Freight Lines

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The Reliance Network

thereliancenetwork.com

Transport America

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Unyson Logistics

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St. Louis, Missouri 63146
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UTXL, Inc.

utxl.com

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734-994-6600

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Winnsboro, Texas 75494
903-342-3516
Toll Free: 800-527-1168
Fax: 903-342-3764
Email: info@teamww.com
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Yusen Logistics Americas Inc.

300 Lighting Way
6th Floor
Secaucus, New Jersey 07094
201-553-3800
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Email: marketing@us.yusen-logistics.com
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aclcargo.com

China Shipping North America

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chinashippingna.com

Clean Energy Fuels

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Newport Beach, California
949-437-1000
cleanenergyfuels.com

CMA CGM

757-961-2100
cma-cgm.com

COSCO Container Lines

Americas, Inc.
201-422-0500
cosco-usa.com

Crowley Maritime Corporation

904-727-2301
crowley.com

DHX - Dependable Hawaiian Express, Inc.

19201 Susana Rd.
Rancho Dominguez, California 90221
310-537-2000
Toll Free: 888-488-4888
Fax: 310-537-1400
Email: CORPORATE@DHX.COM
dhx.com

Evergreen America Line

201-761-3000

FESCO Agencies North America

206-583-0860
fesco-na.com

Great White Fleet (US) Ltd.

888-724-5493
greatwhitefleet.com

Hamburg Sud

hamburgsud-line.com

Hapag-Lloyd (America) Inc.

732-562-1800
hapag-lloyd.com

HHM Port of Hamburg

hafen-hamburg.de

Hyundai Merchant Marine

972-501-1100
hmm21.com

International Shipholding Corporation

251-243-9120
intship.com

Italia Marittima S.p.A.

201-761-3000

Jacksonville Port Authority

(904) 357-3000
jaxport.com

K Line America, Inc.

804-560-3600
kline.com

Kuehne + Nagel

201-413-5500
kuehne-nagel.com

Maersk Inc.

maerskline.com

Maryland Port Administration

marylandports.com

Mediterranean Shipping Company (USA) Inc.

212-764-4800
msc.com

MIQ Logistics

11501 Outlook Street
Suite 500
Overland Park, Kansas 66211
913-696-7100
Toll Free: 877-232-1845
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miq.com

Mode Transportation

972-447-0075
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MOL (America) Inc.

cms.molpower.com

North Carolina State Ports Authority

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ncports.com

OOCL (USA) Inc.
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oocl.com

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Email: about@pashanet.com
pashahawaii.com

Port of Long Beach
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Yusen Logistics Americas Inc.
300 Lighting Way
6th Floor
Secaucus, New Jersey 07094
201-553-3800
Toll Free: 800-414-3895
Email: marketing@us.yusen-logistics.com
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bnsf.com

Canadian Pacific Railway
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CSX Transportation (CSXT) Intermodal
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Intermodal.com

Dart Intermodal, Inc.
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HHM Port of Hamburg
hafen-hamburg.de

Hub Group, Inc.
630-271-3600
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Kansas City Southern
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kcsouthern.com

Mode Transportation
972-447-0075
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Norfolk Southern Corporation
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Schneider National, Inc.
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Transplace
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Triple Crown Services Company
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THIRD-PARTY LOGISTICS SERVICES



FIDELITONE

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Email: marketing@fidelitone.com
FIDELITONE.com

About: FIDELITONE, a supply chain management firm, helps you earn your customers' loyalty through specialized services in last mile delivery, inbound materials management, order fulfillment, service parts management, and transportation.



Purolator International

2 Jericho Plaza
Jericho, New York 11753
888-511-4811
Email: wedelivercanada@purolator.com
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Team Worldwide

P. O. Box 668
Winnsboro, Texas 75494
903-342-3516
Toll Free: 800-527-1168
Fax: 903-342-3764
Email: info@teamww.com
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- Team Logistics
- Team Ocean Services
- Team Customs Brokerage
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LEGACY Supply Chain Services

1941 Citrona Dr.
Suite 300W
Fernandina Beach, Florida 32034
Toll Free: 877-289-0576
Fax: 603-422-7337
Email: contactus@legacyscs.com
legacyscs.com

About: For nearly 40 years, LEGACY Supply Chain Services has been a dedicated logistics partner to our clients across the U.S. and Canada. We provide customized, high-service 3PL solutions including warehousing & distribution, e-commerce fulfillment, transportation brokerage and dedicated fleet. We solve complex logistics challenges for clients with dynamic supply chains - including retail, consumer goods, and industrial manufacturing.



SEKO Logistics

1100 N Arlington Heights Road
Suite 600
Itasca, Illinois 60143
Toll Free: 800-228 2711
Email: hello@sekologistics.com
sekologistics.com

About: We provide complete Supply Chain Solutions, specializing in transportation, logistics, forwarding and warehousing. We also lead the industry with innovative and customizable IT solutions, which provide a seamless flow of information and give our growing customer base true supply chain visibility.



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Suite 200
Frisco, Texas 75034
866-445-9425
Email: info@transplace.com
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Transportation Insight

310 Main Avenue Way SE
Hickory, North Carolina 28602
877-226-9950
Fax: 828-322-2843
Email: info@transportationinsight.com
transportationinsight.com

About: Transportation Insight offers a Co-managed Logistics—form of 3PL, carrier sourcing, freight invoice audit and payment services, state-of-the-art TMS applications and business intelligence. Logistics services include multi-modal domestic transportation (LTL, Parcel, TL), e-commerce shipping solutions, supply chain analytics, international, warehouse sourcing, LEAN consulting and supply chain sourcing of indirect materials.



Yusen Logistics Americas Inc.

300 Lighting Way
6th Floor
Secaucus, New Jersey 07094
201-553-3800
Toll Free: 800-414-3895
Email: marketing@us.yusen-logistics.com
yusen-logistics.com

About: Yusen Logistics is leading global logistics service provider with over 60 years of expertise in warehousing, freight forwarding, and transportation. With more than 20,000 employees and 475 offices worldwide, we provide services to customers across Asia, Europe, North and South America, and Oceania.

a2b Fulfillment, Inc.

150 Stewart Parkway
Greensboro, Georgia 30642
866-843-3827 ext 211
Fax: 706-454-0197
Email: sales@a2bf.com
a2bf.com

AIT Worldwide Logistics, Inc.

630-766-8300
aitworldwide.com

ARMADA

(412) 406-5700
armada.net

Associated Global Systems

516-627-8910
agsystems.com

Barrett Distribution Centers

508-553-8800
barrettdistribution.com

BLG Logistics

blg-logistics.com

C.H. Robinson Worldwide

952-683-2800
chrobinson.com

Cardinal Logistics Management Corporation

1 (704) 786-6125
cardlog.com

CAT Logistics

309-266-3591

CEVA Logistics

904-928-1400
cevalogistics.com

Clean Energy Fuels

4675 MacArthur Ct
Newport Beach, California
949-437-1000
cleanenergyfuels.com

CLX Logistics

215-461-3805
clxlogistics.com

Comprehensive Logistics Company

complog.com

Conexus Logistics

918-234-4414
conexuslogistics.com

Crowley

904-727-2301
crowley.com

CRST Logistics

(866) 721-5647
crst.com/companies/logistics/

Deringer, Inc.

802-524-8110
anderinger.com

DGX - Dependable Global Express

19201 Susana Rd.
Rancho Dominguez, California 90221
310-669-8888
Toll Free: 888-488-4888
Fax: 310-537-9198
Email: CORPORATE@DGXGLOBAL.COM
dgxglobal.com

DHL Logistics Solutions

logistics.dhl

DSC Logistics

847.390.6800

dsclogistics.com

DSV

516 394 6200

dsv.com

DSV Global Transport and Logistics

1 (562) 552-9400

dsv.com

FedEx Global Supply Chain Services

800-222-7657

fedex.com/us/supply-chain

FedEx Trade Networks

1-716-879-1075

ftn.fedex.com/us/

FIDELITONE

847-487-3300

FIDELITONE.com

GENCO

supplychain.fedex.com

Geodis

615-401-6400

geodis.us

Inmar

855-815-2646

inmar.com

Kane Is Able, Inc.

kaneisable.com

Kenco

kencogroup.com

Kenneth Clark Company, Inc.

410-465-5116

kennethclark.com

Kuehne + Nagel

201-413-5500

kuehne-nagel.com

LEGACY Supply Chain Services

Toll Free: 877-289-0576

legacyscs.com

Lynden Logistics

lynden.com/lint/

MACROPOINT

macropoint.com

MIQ Logistics

11501 Outlook Street

Suite 500

Overland Park, Kansas 66211

913-696-7100

Toll Free: 877-232-1845

Email: contact_us@miq.com

miq.com

MKM Distribution Services Inc

317-334-7900

mkmdistribution.com

Mode Transportation

1 (972) 447-0075

modetransportation.com

NFI Logistics

877-NFI-3777

NFIndustries.com

NRS - National Retail Systems, Inc.

201-330-1900

nationalretailsystems.com

NVC Logistics Group

714.529.8005

nvclogistics.com

Odyssey Logistics & Technology

39 Old Ridgebury Rd

Danbury, Connecticut 06810

203-448-3816

Toll Free: 855-412-0200

Email: sales@odysseylogistics.com

odysseylogistics.com

Penske Logistics

penskelogistics.com

Pilot Freight Services

610-891-8100

pilotdelivers.com

PLS Logistics Services

3120 Unionville Rd

Suite 100, Bldg 110

Cranberry Twp, Pennsylvania 16066

724-814-5100

Fax: 724-814-5200

Email: marketing@plslogistics.com

plslogistics.com

Port Logistics Group

1 (973) 249-1230

PortLogisticsGroup.com

Prologis

303-567-5000

Purolator International

888-511-4811

purolatorinternational.com

Quiet Logistics

877-887-8438

Redwood Logistics

312-698-8334

redwoodlogistics.com

Ruan

866-782-6669

Ryder System, Inc.

305-500-3726

ryder.com

Saia Inc.

1 (800) 765-7242

saiacorp.com

SEKO Logistics

Toll Free: 800-228-2711

sekologistics.com

Suddath Global Logistics

1 (904) 858-1234

suddath.com

Team Worldwide

903-342-3516

Toll Free: 800-527-1168

teamww.com

TransGroup Global Logistics
(206) 244-0330
transgroup.com

Transplace
866-445-9425
transplace.com

Transportation Insight
877-226-9950
transportationinsight.com

Tucker Company Inc.
856-317-9600
tuckerco.com

United States Postal Service
800-275-8777

Universal
1 (586) 920-0100
universallogistics.com

UPS Supply Chain Solutions
913-693-6151

Werner Global Logistics
402-895-6640
werner.com

WSI (Warehouse Specialists, LLC)
1 (920) 831-3700
wsinc.com

XPO Logistics, Inc.
1 (248) 648-6110
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One Meadowlands Plaza
East Rutherford, New Jersey 07073
201-935-8588
Fax: 201-935-5187
Email: Solutions@AmberRoad.com
AmberRoad.com

About: Amber Road's mission is to dramatically transform the way companies conduct global trade. As a leading provider of cloud-based global trade management (GTM) software, trade content and training, we help companies all over the world create value through their global supply chain by improving margins, achieving greater agility and lowering risk.



Quintiq

201 King of Prussia Rd
Suite 500
Radnor, Pennsylvania 19089
610-964-8111
Fax: 610-964-8113
Email: info@quintiq.com
Web: quintiq.com

About: Every business has its supply chain planning puzzles, some are large, some are complex, some seem impossible to solve. Quintiq solves those puzzles using a single supply chain planning & optimization software.



Transplace

3010 Gaylord Pkwy
Suite 200
Frisco, Texas 75034
866-445-9425
Email: info@transplace.com
transplace.com

About: Transplace is a North American non-asset based logistics services provider offering manufacturers, retailers, chemical and consumer packaged goods companies the optimal blend of logistics technology and transportation management services. Our services include Transportation Management Services, Intermodal, Brokerage and SaaS Transportation Management (TMS) Solutions supplemented by supply chain strategy consulting services.



CT Logistics

12487 Plaza Drive
Cleveland, Ohio 44130
216-267-2000, ext. 2190
Fax: 216-267-5945
Email: sales@ctlogistics.com
ctlogistics.com

About: Since 1923, CT has provided global freight audit/payment for all modes/currencies. Partner with CT to design and deliver customized supply chain solutions. CT's FreightRater™ software is the industry's first choice for freight analysis and TMS solutions. CT provides BI for benchmarking/trending with dashboards. CT has SOCII and ISO 9001:2008 certifications.



SEKO Logistics

1100 N Arlington Heights Road
Suite 600
Itasca, Illinois 60143
Toll Free: 800-228-2711
Email: hello@sekologistics.com
sekologistics.com

About: We provide complete Supply Chain Solutions, specializing in transportation, logistics, forwarding and warehousing. We also lead the industry with innovative and customizable IT solutions, which provide a seamless flow of information and give our growing customer base true supply chain visibility.



Yusen Logistics Americas Inc.

300 Lighting Way
6th Floor
Secaucus, New Jersey 07094
201-553-3800
Toll Free: 800-414-3895
Email: marketing@us.yusen-logistics.com
yusen-logistics.com

About: Yusen Logistics is leading global logistics service provider with over 60 years of expertise in warehousing, freight forwarding, and transportation. With more than 20,000 employees and 475 offices worldwide, we provide services to customers across Asia, Europe, North and South America, and Oceania.

3GTMS

3gtms.com

4SIGHT Supply Chain Group

1 (973) 435-0025
go4sight.com

ALK Technologies - PC*MILER

800-377-6453
pcmiler.com

Amber Road, Inc.

201-935-8588
AmberRoad.com

Andlor Logistics Systems

1 (604) 687-1130
Andlor.Com

Apex Logistics

732-940-7328
apexlogisticsinc.com

Argos Software

7060 N. Fresno Street
Ste. 210
Fresno, California 93720
559-227-1000
Email: webinfo@argossoftware.com
argossoftware.com

About: Argos Software offers solutions for Warehouses, including supply chain management, transportation management, accounting, inventory, bar code scanning, RF, mobile capability and much more!

As a subsidiary of Vela and Constellation Software, under the FOG Software Group umbrella, Argos Software has been in the supply chain software business since 1979.

ASAP Automation LLC

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asap-automation.com

BearCom

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bearcom.com

Biznet Solutions Ltd

+44 2871 277 050
biznetsolutions.com

BluJay Solutions Inc.

1 Executive Drive
Chelmsford Massachusetts 01824
866-584-7280
blujaysolutions.com

C3 Solutions

1 (514) 315-3139
c3solutions.com



Cadre Technologies, Inc.

7900 E. Union Avenue
Suite 1007
Denver, Colorado 80237
866-252-2373
Email: sales@cadretech.com
cadretech.com

About: Cadre solutions include Cadence WMS and Accuplus, comprehensive warehouse logistics systems which manages 3PL warehouse operations, activity billing, inventory and more, and LogiView, a Microsoft.NET based SaaS application that provides real-time inven-



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Descartes Systems Group

120 Randall Drive
Waterloo, Ontario N2V1C6
519-746-8110
Toll Free: 800-419-8495
Email: info@descartes.com
descartes.com

About: Descartes' software-as-a-service solutions improve the productivity, performance and security of logistics-intensive businesses. Our solutions are used to route delivery resources; plan and execute shipments; manage transportation; access global trade data; file customs and security documents; and complete other processes by participating in the world's largest, collaborative multimodal logistics community.

Dessault Systems
1-562-951-8000
apriso.com

DMLogic
412-458-4010
dmlogicllc.com

E2open
650-381-3700
e2open.com

EC Market Inc
ecmarket.com

eCustoms
1 (716) 881-2590
ecustoms.com

Elemica
1 (484) 253-4674
elemica.com

enVista
317-208-9100
envistacorp.com

Epicor Software Corporation
1 (215) 493-8900
epicor.com

FORTE
1 (513) 398-2800
forte-industries.com

FusionOps
1 (408) 524-2222
fusionops.com

Genpact
212 896 6600
genpact.com

GT Nexus
510-747-3200
gtnexus.com

Gudel, Inc.
734-214-0000

Highjump Software
952-947-4088
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Honeywell
honeywell.com

IBM
ibm.com/solutions/alliance/us/en/index/scm.html

IFS
ifsworld.com/us/

InfinityQS
703-961-0200
infinityqs.com

Infor
646-336-1700
infor.com

Inovis, Inc.
404-467-3000
inovis.global

Insight
703-366-3061
insightoutsmart.com

Integration Point
1 (704) 576-3678
integrationpoint.com

IntelliTrans
intellitrans.com

Jump Technologies
1 (651) 287-6000
jumptech.com

Kapow Software
kofax.com

Kinaxis
613-592-5780

Kronos
978-250-9800
kronos.com

LLamasoft, Inc.
1 (734) 418-3119
llamasoft.com

LOG-NET, Inc.
732-758-6800

Logility
logility.com



Logimax
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Jacksonville, Florida 32256
855-253-8855
Email: info@e-logimax.com
e-logimax.com

About: Logimax offers software solutions for your warehouse, including WMS for 3PL and for distribution, support modules, metrics and KPI with modules like EDI, Integrated billing in inventory control, Real time RF data and more!

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Microsoft Corporation
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Motorola Solutions
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motorolasolutions.com

NCR
800-Call-NCR
ncr.com/retail

NetSuite
netsuite.com

Next Generation Logistics, Inc.

847-963-0007
nextgeneration.com

Omnitracs

omnitracs.com

One Network Enterprises

onenetwork.com

**Open Sky Group**

1501 Lakestone Village LN
Suite 207
Fuquay-Varina, North Carolina 27526
919-346-4500
Toll Free: 866-359-4437
Fax: 919-800-3404
Email: eric.neff@openskygroup.com
openskygroup.com

About: Open Sky Group specializes in the implementation and integration of Warehouse Management, Labor and Transportation Management software. Open Sky Group's focus is on decreasing the time of implementation; getting you the system you need in six months or less to help keep your time and cost investment lower.

Oracle Corporation

650-506-7000
oracle.com

Peak Ryzex

peak-ryzex.com

QAD Inc.

805-684-6614

Qualcomm Inc.

858-587-1121

Quintiq

610-964-8111
quintiq.com

Reddwerks Corporation

512-257-3031
reddwerks.com

SAP

866-379-4715

SATO America

10350-A Nations Ford Rd.
Charlotte, North Carolina 28273
704-644-1650
Fax: 704-644-1662
Email: sales-sallc@sato-global.com
sato-america.com

Schneider Electric

877-272-2722
schneider-electric.com

SEKO Logistics

Toll Free: 800-228-2711
sekologistics.com

SmartBOL

1 (732) 981-0444
smartbol.com

SMC3

770-486-5800
smc3.com

Snapfulfil SaaS WMS

720-372-1250
snapfulfil.com

Snowfall Technologies LLC

214-632-4498
<http://snowfalltechnologies.com>

**Softeon**

11700 Plaza America Drive, Suite 910
Reston Virginia 20190
United States
703-793-0005
Toll Free: 1-855-SOFTEON
Fax: 703-793-1604
Email: contact@softeon.com
Web: softeon.com

About: Maybe you aren't familiar with Softeon, but that's okay. It's really our fault, because we don't invest a great deal of our resources in excessive advertising - we invest in: Our Technology, Our Talented Team, and Our Clients. Visit [Softeon.com](http://softeon.com) to learn more about our innovation and our successful partnerships.

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Streamline, Inc

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streamline.bz

SupplyOn

248-758-2300

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404-355-3220
eyc.com/gold

Syncron

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TCLogic

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Technogix Decision Sciences Inc.

905-889-2178

TECSYS

1 (514) 866-0001
tecsys.com

TMW Systems

tmwsystems.com

Toshiba

toshiba.com

TraceLink Inc

781-938-6500

Transite Technology, Inc.

919-862-1900

Transplace

866-445-9425
transplace.com

Westfalia Technologies

1 (717) 764-1115
westfaliausa.com

Wolters Kluwer Transport Services -

Transwide TMS
1 (800) 763-3240
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Xeneta AS

xeneta.com

XpressRate

1 (855) 517-3777
xpressrate.com

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Toll Free: 800-414-3895
yusen-logistics.com



Sourcing and Procurement Solutions

The following is a representative sample; it is not intended to be an exhaustive listing of all the companies in this category.



FIDELITONE

1260 Karl Ct.
Wauconda, Illinois 60084
847-487-3300
Email: marketing@fidelitone.com
FIDELITONE.com

About: FIDELITONE, a supply chain management firm, helps you earn your customers' loyalty through specialized services in last mile delivery, inbound materials management, order fulfillment, service parts management, and transportation.

1st Source Products, Inc.

877-338-9403
1stsourceproducts.com

A. T. Kearney Procurement Solutions

312-223-6400
atkearney.com

Amatech, Inc.

800-403-6920
amatechinc.com

Ariba

866-772-7422
ariba.com

BasWare

203-487-7900
basware.com

Beroe, Inc.

919-363-9058
beroe-inc.com

Corporate United

440-895-0938
corporateunited.com

Emptoris, Inc.

781-993-9212

Epiq Technologies, Inc.

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epiqtech.com

FIDELITONE

847-487-3300
FIDELITONE.com

Fieldglass

fieldglass.com

Genpact

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genpact.com

GEP

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smartbygep.com

Hertzler Systems Inc.

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hertzler.com

IBM

ibm.com/solutions/alliance/us/en/index/scm.html

IQNavigator

303-563-1500

MCS Management Services

215-405-8100

Mode Transportation

1 (972) 447-0075
modetransportation.com

Motion Industries

(205) 956-1122
motion-ind.com

Perfect Commerce

757-766-8211

Puridium

800-388-1415

SciQuest

888-638-7322
sciquest.com

Source One Management Services, LLC

215-902-0200

Zoyto

1 (713) 300-3000
Zoyto.com



Professional Associations

The following is a representative sample; it is not intended to be an exhaustive listing of all the companies in this category.

APICS The Association for Operations Management
773-867-1777
apics.org

APQC
800-776-9676

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



Forklift Academy
5737 Kanan Rd.
Suite 508
Agoura Hills, California 91301
888-381-2572
Email: info@forkliftacademy.com
forkliftacademy.com

About: Forklift Academy created affordable forklift certification solutions for companies and individuals to comply with OSHA. Our training solutions include convenient online training, in person training at our academy, on-site training at your location, and a master trainer's kit for companies to establish and run their own program effortlessly.

Institute For Supply Management
instituteforsupplymanagement.org

International Society of Logistics
301-459-8446

IQPC
800-882-8684

ISM (Institute for Supply Management)
480-752-6276
instituteforsupplymanagement.org

Material Handling Industry
8720 Red Oak Blvd.
Suite 201
Charlotte, North Carolina 28217
704-676-1190
Fax: 704-676-1199
mhi.org

NITL (National Industrial Transportation League)
703-524-5011

SIG (Sourcing Interests Group)
530-582-8600
sig.org

The National Academies of Sciences, Engineering, and Medicine
202-334-2000
trb.org

WERC (Warehousing Education & Research Council)
630-990-0001



Consulting and Professional Services

The following is a representative sample; it is not intended to be an exhaustive listing of all the companies in this category.



CT Logistics

12487 Plaza Drive
Cleveland, Ohio 44130
216-267-2000, ext. 2190
Fax: 216-267-5945
Email: sales@ctlogistics.com
ctlogistics.com

About: Since 1923, CT has provided global freight audit/payment for all modes/currencies. Partner with CT to design and deliver customized supply chain solutions. CT's FreightRater™ software is the industry's first choice for freight analysis and TMS solutions. CT provides BI for benchmarking/trending with dashboards. CT has SOCII and ISO 9001:2008 certifications.

4SIGHT Supply Chain Group

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go4sight.com

A. T. Kearney, Inc.

312-648-0111
atkearney.com

Aberdeen Group

617-723-7890
aberdeen.com

Accenture

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accenture.com

Accenture Strategy

1 212 319 9450
kurtsalmon.com/en-us/

ARC Advisory Group

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arcweb.com

BearingPoint

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703-902-5000
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Boston Consulting Group

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Bristlecone

650-386-4000
bccone.com

CapGemini

617-207-8789
capgemini.com

Chain Connectors, Inc.

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Chain Link Research

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Chainalytics

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CSC Consulting

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cscconsulting.com

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440-248-3370
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Enterprise Florida

enterpriseflorida.com

FDG

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fdgatlanta.com

Fennimore Solutions

fennimoresolutions.com



Forklift Academy

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Suite 508
Agoura Hills, California 91301
888-381-2572
Email: info@forkliftacademy.com
forkliftacademy.com

About: Forklift Academy created affordable forklift certification solutions for companies and individuals to comply with OSHA. Our training solutions include convenient online training, in person training at our academy, on-site training at your location, and a master trainer's kit for companies to establish and run their own program effortlessly.

Forrester Research
617-613-5730
go.forrester.com

Gartner
203-964-0096
gartner.com

GCL Group
866-364-4721
gclgroup.com

Greybeard Advisors
412-874-8410
greybeardadvisors.com

Hitachi Consulting
214-665-7000
hitachiconsulting.com

IBM Consulting
www-935.ibm.com/services/us/gbs/
consulting

IntelliTrans
intellitrans.com

KEOGH Consulting
440-526-2002
keogh1.com

LTD Management
610-458-3636

MEP Supply Chain Optimization
301-975-3255
mepsupplychain.org

Pragmatek
612-333-3164

R. Michael Donovan & Co.,Inc.
508-788-1100

RGP
rgp.com

St. Onge Company
717-840-8181

Supply Chain Visions
703-825-4031
supplychainvisions.com

Tenzing Consulting
724-940-4060

Tompkins International
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Email: sales@ctlogistics.com
ctlogistics.com

About: Since 1923, CT has provided global freight audit/payment for all modes/currencies. Partner with CT to design and deliver customized supply chain solutions. CT's FreightRater™ software is the industry's first choice for freight analysis and TMS solutions. CT provides BI for benchmarking/trending with dashboards. CT has SOCII and ISO 9001:2008 certifications.

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CT Logistics
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ctlogistics.com

Euler Hermes
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Gateway Commercial Finance LLC
1 (561) 734-2706
gatewaycfs.com

GE Capital
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GT Nexus
646-336-1700
gtnexus.com/solutions/network-financial-supply-chain/

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jpmorganchase.com

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kpmg.com

MasterCard Worldwide
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Meridian Finance Group
310-260-2130
meridianfinance.com

PrimeRevenue
678-904-7100

Rapid Ratings
rapidratings.com

The Garden City Group, Inc.
gardencitygroup.com

UPS Capital
35 Glenlake Parkway NE
Atlanta, Georgia 30328
877-263-8772
upscapital.com

US Bank
800-417-1844
usbank.com

Visa Inc.
800-847-2911

Wells Fargo
800-869-3557
wellsfargo.com



Educational and Professional Development



The following is a representative sample; it is not intended to be an exhaustive listing of all the companies in this category.

Accenture Supply Chain Academy
917-452-4946
supplychain.accentureacademy.com

Arizona State University
480-965-7788
wpcarey.asu.edu/exec

Auburn University
334-844-4000

Cranfield University/School of Management
44-011-1234-75112
cranfieldmsc.biz/log

DePaul University
312-362-8000
depaul.edu



Forklift Academy

5737 Kanan Rd.
Suite 508
Agoura Hills, California 91301
888-381-2572
Email: info@forkliftacademy.com
forkliftacademy.com

About: Forklift Academy created affordable forklift certification solutions for companies and individuals to comply with OSHA. Our training solutions include convenient online training, in person training at our academy, on-site training at your location, and a master trainer's kit for companies to establish and run their own program effortlessly.

George Institute of Technology
404-385-7306

Golden Gate University
415-442-7800
ggu.edu

Indiana University
877-785-4713

Lehigh University
610-758-5285

Massachusetts Institute of Technology (MIT)
617-258-7267
ctl.mit.edu

Michigan State University
517-355-8377
bus.msu.edu/msc

Niagara University
716-286-8050
bus.msu.edu/msc

North Carolina State University
919-515-5560
mgt.ncsu.edu

Northeastern University
866-890-0347 x3510
cba.neu.edu

Northwestern University
847-467-7020
kellogg.northwestern.edu/execed

Ohio State University
614-292-8808
fisher.osu.edu

Penn State University
814-865-3435
smeal.psu.edu/psep

Rutgers Business School
973-353-1234
business.rutgers.edu

Shippensburg University
717-477-1483
ship.edu/business

Stanford University
650-724-6301

Syracuse University
315-443-3751
whitman.syr.edu/scm

Texas A&M University
979-845-1616
mays.tamu.edu

Texas Christian University (TCU)
817-257-7572

The World Academy
908-354-7746
theworldacademy.com

University of Arkansas
479-575-6142
waltoncollege.uark.edu

University of Liverpool
31-0-20-713-0000
ohecampus.com

University of Maryland
301-405-2189
rhsmith.umd.edu

University of Michigan
734-763-7804
michiganross.umich.edu

University of San Diego
619-260-4600
sandiego.edu/scmi

University of San Francisco
800-609-4196
usanfranonline.com/ism

University of Tennessee
865-974-5001
supplychain.utk.edu

University of Wisconsin-Madison
608-441-7357
exed.wisc.edu/supplychain

Walden University
866-492-5336
waldenu.edu



Warehouse/DC

The following is a representative sample; it is not intended to be an exhaustive listing of all the companies in this category.



FIDELITONE

FIDELITONE

1260 Karl Ct.
Wauconda, Illinois 60084
847-487-3300
Email: marketing@fidelitone.com
FIDELITONE.com

About: FIDELITONE, a supply chain management firm, helps you earn your customers' loyalty through specialized services in last mile delivery, inbound materials management, order fulfillment, service parts management, and transportation.



LEGACY SUPPLY CHAIN SERVICES

LEGACY Supply Chain Services

1941 Citrona Dr.
Suite 300W
Fernandina Beach, Florida 32034
Toll Free: 877-289-0576
Fax: 603-422-7337
Email: contactus@legacyscs.com
legacyscs.com

About: For nearly 40 years, LEGACY Supply Chain Services has been a dedicated logistics partner to our clients across the U.S. and Canada. We provide customized, high-service 3PL solutions including warehousing & distribution, e-commerce fulfillment, transportation brokerage and dedicated fleet. We solve complex logistics challenges for clients with dynamic supply chains - including retail, consumer goods, and industrial manufacturing.



Purolator International

2 Jericho Plaza
Jericho, New York 11753
888-511-4811
Email: wedelivercanada@purolator.com
purolatorinternational.com

About: Purolator International is a subsidiary of Purolator Inc., a leading integrated freight, package and logistics solutions provider in Canada. Purolator International specializes in the air and surface forwarding of Express, Freight and Parcel shipments, customs brokerage, and fulfillment and delivery services to, from and within North America. For more information: 1.888.511.4811, option 3 or email: wedelivercanada@purolator.com



Yusen Logistics Americas Inc.

300 Lighting Way
6th Floor
Secaucus, New Jersey 07094
201-553-3800
Toll Free: 800-414-3895
Email: marketing@us.yusen-logistics.com
yusen-logistics.com

About: Yusen Logistics is leading global logistics service provider with over 60 years of expertise in warehousing, freight forwarding, and transportation. With more than 20,000 employees and 475 offices worldwide, we provide services to customers across Asia, Europe, North and South America, and Oceania.

A. Duie Pyle, Inc.

650 Westtown Rd
PO Box 564
West Chester, Pennsylvania 19382
800-523-5020
Fax: 610-350-0406
Email: contact@aduiepile.com
aduiepile.com

ADSI

1 (847) 884-1940
adsionline.com

AmbaFlex Inc.

877-800-1634
ambaflex.com

AS/R Systems, Inc.

847-955-0980
ASRSystems.com

Ashland Conveyor Products

419-496-2974
ashlandconveyor.com

Axmann Conveying Systems

812-284-9285
axmann-fs.com

B-Tek Scales, LLC

b-tek.com

Camcode

camcode.com

Cognex Corporation

cognex.com

Cree, Inc.

cree.com

Crown Equipment

1 (419) 629-2311
crown.com

Cushman

706-798-4311
cushman.com

DENSO ADC

denso-adc.com

DMW&H Systems

201-635-3493
dmwandh.com

East Coast Storage Equipment

620 Burtis St
Brick, New Jersey 08723
732-451-1808
888-294-5022
Email: info@ecseco.com
ecseco.com

Emerson Industrial Automation

859-342-7900
emersonindustrial.com

FIDELITONE

847-487-3300
FIDELITONE.com

FlexLink Systems, Inc.

610-973-8200
flexlink.com

FMH Conveyors

678-745-3720
flexmh.com

Graybar

graybar.com

Honeywell

425-348-2600
intermec.com

Hoosier Energy Economic Development

hoosiersites.com

Hyster Company

(440) 449-9600
hyster.com

Hyundai Heavy Industries

hceamericas.com

Komatsu Forklift USA

(847) 437-5800
komatsuforkliftusa.com

LEGACY Supply Chain Services

877-289-0576
legacyscs.com

Mitsubishi Electric Automation Inc.

847-478-2100
us.mitsubishielectric.com

Murata Machinery

muratec-usa.com

Narrow Aisle, Inc.

214-819-4180
narrowaisleinc.com

NCR

800-Call-NCR
ncr.com/retail

Newcastle Systems

newcastlesys.com

Newell Rubbermaid

newellbrands.com

Omnitracs

omnitracs.com

ONSET

onsetcomp.com

Packsize LLC

6440 S. Wasatch Blvd.
Salt Lake City, Utah 84121
801-944-4814
Fax: 801-944-4815
Email: info@packsize.com
packsize.com

Polymer Solutions International

877-444-7225
prostack.com

Postea

postea.com

Presto Lifts

1 (508) 222-0177
prestolifts.com

Pro Line

1proline.com

Purolator International

888-511-4811
purolatorinternational.com

Ralphs-Pugh Co.

707-745-6222
ralphs-pugh.com

Rapid Industries, Inc

502-968-3645
rapidindustries.com

Raymond Corporation

1 (607) 656-2311
raymondcorp.com

Reddwerks Corporation

512-257-3031
reddwerks.com

Rite-Hite

414-355-2200
ritehite.com

Sackett Systems, Inc.

630-766-5500
sackett-systems.com

SAG (Securitag Assembly Group Co., Ltd.)

+886-4-2492-5298
sag.com.tw

Sealed Air Corporation

sealedair.com

SencorpWhite

508-771-9400
sencorpwhite.com

SEW-Eurodrive

1 (864) 439-8792
seweurodrive.com

Shockwatch

214-630-9625
shockwatch.com

SI Systems

1 (610) 252-7321
sihs.com

SmartBOL

1 (732) 981-0444
smartbol.com

Snapfulfil SaaS WMS

720-372-1250
snapfulfil.com

Snowfall Technologies LLC

214-632-4498
snowfalltechnologies.com

Speech Interface Design, Inc.

412-323-1135
speech-interface.com

Speedrack Products Group, Ltd

616-887-0002
speedrack.net

SPG International

847-541-6500
spgusa.com

Spiratex

734-641-4111
spiratex.com

Stanley Vidmar

1 (610) 776-3810
stanleyvidmar.com

SymphonyEYC

404-355-3220
eyc.com/gold

System Group

39-0-536-836-542
system-group.it

System Logistics Corp.

207-784-1381
systemlogistics.com

Systems Application Engineering (SAE)

713-783-6020
saesystems.com

Tailift USA Co., Inc.

1 (909) 930-9801
tailift-usa.com

TECSYS

1 (514) 866-0001
tecsys.com

TEKLYNX International

414-228-3335
teklynx.com

TGW Logistics Group

1 (231) 798-4547
tgw-group.com

Topper Industrial

262-886-6931
topperindustrial.com

TotalTrax

302-514-0600
totaltraxinc.com

TranSystems

816-329-8700
transystems.com

TriEnda LLC

608-742-5303
trienda.com

Uline

uline.com

UNARCO Material Handling, Inc.

615-384-3531
UNARCORACK.com

UNEX

1 (732) 928-2800
unex.com

Van der Graaf

1 (905) 793-8100
vandergraaf.com

VARGO Companies

1 (614) 876-1163
vargosolutions.com

Viastore Systems

1 (616) 977-3950
us.viastore.com

Vidir Inc.

1 (204) 364-2442
storevertical.com

Warehouse Specialists Inc.

920-830-5000
wsinc.com

Webb-Stiles Co

330-225-7761
webb-stiles.com

Westfalia Technologies

1 (717) 764-1115
westfaliausa.com

Wildeck, Inc.

405 Commerce Street
Waukesha, Wisconsin 53186
262-549-4000
Toll Free: 800-325-6939
Fax: 262-549-3466
Email: info@wildeck.com
wildeck.com

Wynright

847-595-9400
wynright.com

Yale Materials Handling Corporation

yale.com/north-america/en-us/

Yusen Logistics Americas Inc.

201-553-3800
Toll Free: 800-414-3895
yusen-logistics.com

Zebra Technologies Corporation

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