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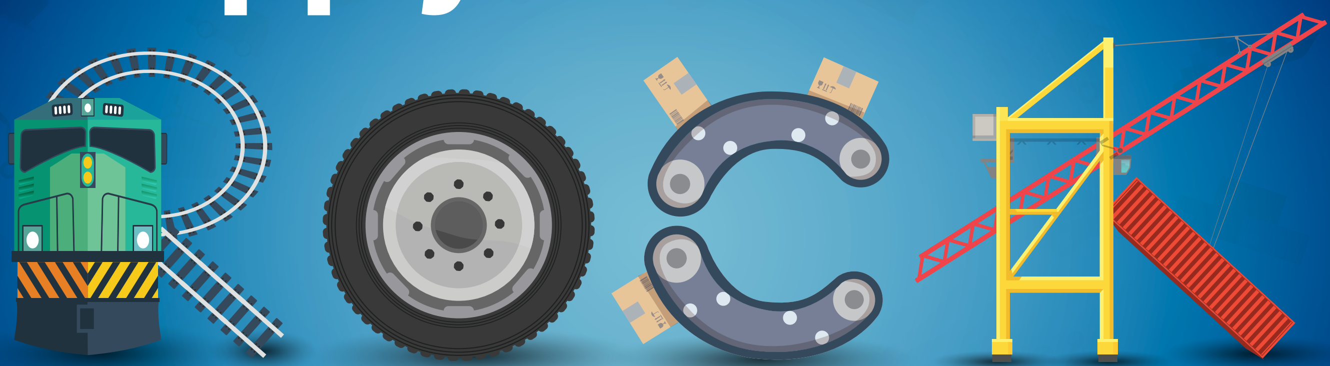
THE MAGAZINE FOR DEMAND-DRIVEN LOGISTICS • JANUARY 2016

SPECIAL ISSUE

LOGISTICS 2016 PLANNER

Supply Chains That



Around The Clock

ALSO IN THIS ISSUE:

STRIKEPOINT, REVISITED

AUTOMOTIVE AFTERMARKET: TIME FOR A TUNEUP?

A NEW Rx FOR PHARMA COLD CHAINS

#CULTURE
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"I heard the stories, but when I came to LEGACY I realized the focus on customer service is for real. Our culture empowers us to go the extra mile."
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THE MAGAZINE FOR DEMAND-DRIVEN LOGISTICS

SUPPLY CHAINS THAT ROCK AROUND THE CLOCK
page 105

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INSIGHT

DC SOLUTIONS:
COMING IN OUT OF THE COLD
page 311

INPRACTICE

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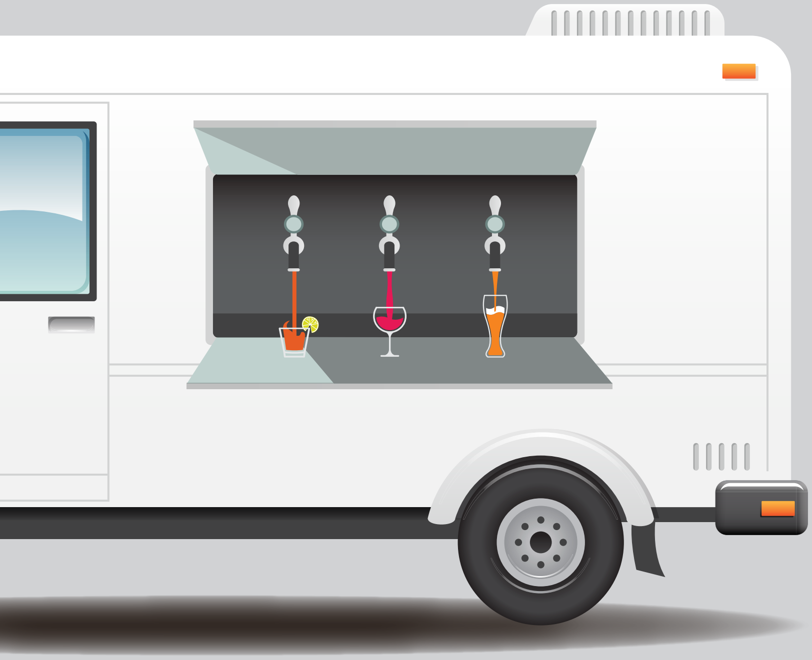

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LIQUOR LOGISTICS: SOLUTIONS ON TAP
page 156

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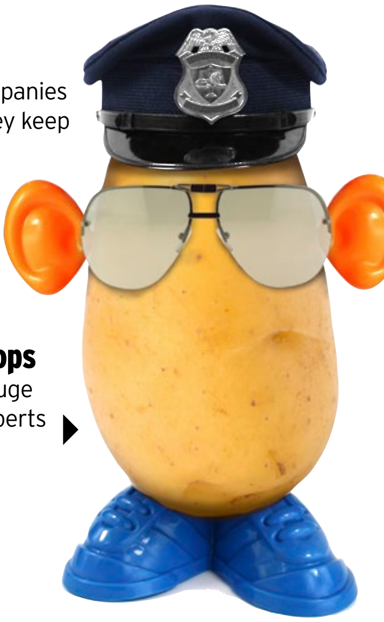


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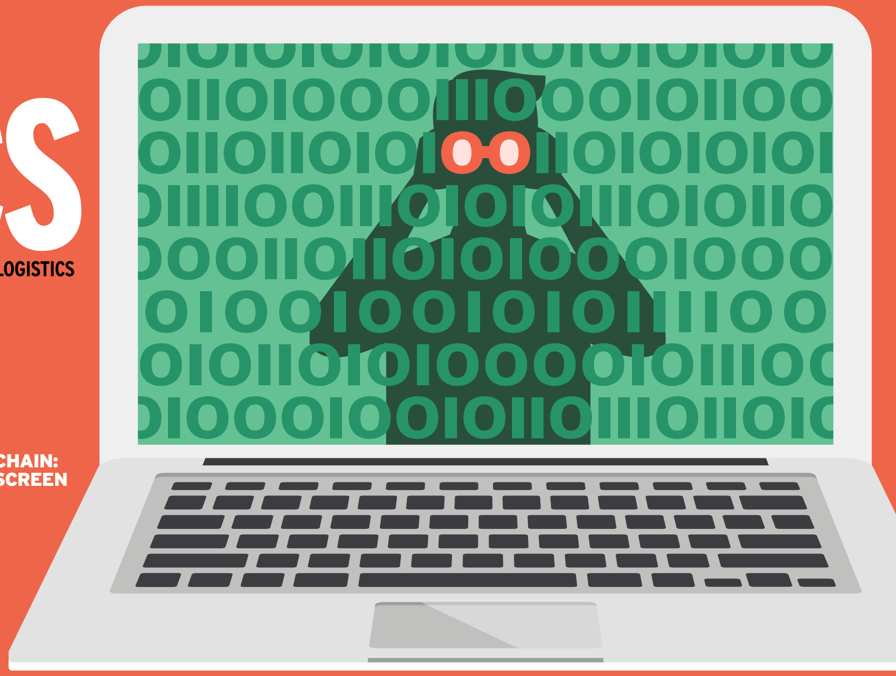

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INSIGHT

INFOCUS

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INFO

STARTING ON PAGE 337

SPECIAL SUPPLEMENT
2016 LOGISTICS PLANNER

The 2016 Logistics Planner provides detailed information on the segment leaders that stand ready to help you meet your transportation and logistics challenges.

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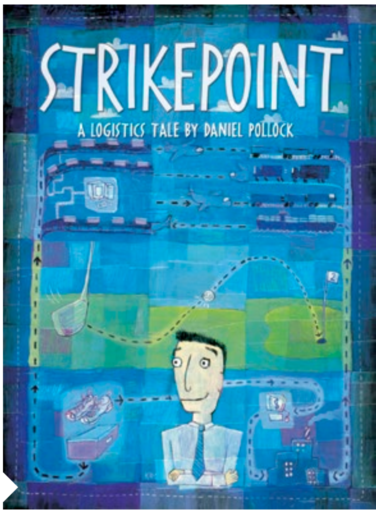


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ONLINE EXCLUSIVES

How Chain of Responsibility Affects the Supply Chain bit.ly/ChainOfResponsibility

Greg Braun, Senior Vice President Sales and Marketing, C3 Solutions

The looming Chain of Responsibility legislation is expected to affect all areas of the supply chain. Find out how these new laws have the potential to dramatically change the way you ship your goods.

The Perfect Order Has Evolved. Has Your Workforce Management Strategy? bit.ly/PerfectOrder

Malysa O'Connor, Director, Kronos for Logistics

Workforce management helps ensure you meet perfect order targets for your customers and for your bottom line. Use this advice to uncover hidden costs, maximize performance, and manage compliance risk as part of your workforce management strategy.

Dimensioning on the Move bit.ly/DimensioningOnTheMove

Jerry Stoll, Transportation and Logistics Market Manager for the Americas, Mettler Toledo

For quickly measuring freight at the pickup point, reclassifying pallets, and managing low-volume operations, mobile dimensioning is a low-cost game-changer. Here's a look at why this tool is garnering so much attention.

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CHECKINGIN

Keith Biondo

by Keith Biondo | **Publisher**

The Supply Chain of the Future?

We have achieved a good measure of being able to match demand to supply, and have aligned enterprise operations to support that purpose. But now that we have achieved that goal, we begin again—with a new global supply chain metastructure that is always on, never off.

Consumer impatience drives supply chain impatience. For example, Adidas has established a "speedfactory" in Germany, run largely by robots, which will make its first 500 pairs of running shoes this year. Why? Because faster manufacturing and proximity to major markets meet demand for quicker delivery of new, high-end styles. It's demand-driven, at high speed.

Robots provide not just speed but also flexibility, as they are being taught to act more like humans. Product development company Cambridge Consultants recently demonstrated a new type of industrial robot that combines high-powered, image-processing algorithms with inexpensive, off-the-shelf hardware that enables robots to handle objects such as odd-sized boxes in a warehouse, or dissimilar components on a production line when no detailed computer-aided design instructions exist. This development will revolutionize production and warehouse operations in the near future, according to Cambridge.

Robots are also appearing on the retail end of the value chain. For example, Simbe Robotics recently debuted what it calls "the world's first fully autonomous shelf auditing and analytics solution." Named Tally, the robot looks like a Roomba-powered stockkeeping Ninja that quietly stalks store aisles, day and night, delivering stockout, stock low, pricing errors, and promotion level data—in short, completing a full retail store audit in near real time. Tally can capture data on 15,000 to 20,000 products hourly, far more than a non-Ninja human employee. Why wait for check-out big data when Tally can send replenishment alerts to you, with more lead time?

The automotive industry is also part of the new supply chain metastructure. Volkswagen is piloting 3D smart glasses at its Wolfsburg, Germany, plant to speed production. Logistics personnel wearing the smart glasses receive details on storage locations and part numbers directly in their field of vision. They see warnings in red if they pull parts incorrectly or out of sequence. "Digitalization is becoming increasingly important in production," says Reinhard de Vries, head of plant logistics at the VW Wolfsburg plant. "The 3D smart glasses take cooperation between humans and systems to a new level."

These examples all represent a fourth industrial revolution, and it is happening before our eyes. We are rapidly piecing together a global supply chain metastructure that never stops running and will truly make our entire world a warehouse. Get ready.

It is imperative that younger readers who were born with a smartphone in their hands, and are at ease accepting and applying every new logistics technology as it arises, achieve equal facility in the practical experience of transportation operations. Seasoned supply chain readers need to stay current. Learn. Engage. Read. Study. Be creative. Think laterally, and seek ways to connect these new advances to your network, your enterprise.

As you'll see in this edition's lead feature, *Supply Chains That Rock Around the Clock (page 105)*, supply chain success depends on more than just technology. Success requires building relationships, employing out-of-the-box thinking, and working together to aggressively attack seemingly impossible supply chain challenges.

It wasn't so long ago that these types of advances seemed doable in some far-off, distant supply chain future. Acclimating, absorbing, and applying these fast-approaching developments won't be easy. But if you are not part of this future, you will likely be part of the past. ■

Inbound Logistics (ISSN 0888-8493, USPS 703990) is published 12 times a year on the 15th of the month for 60,000 people who buy, specify, or recommend logistics, logistics technology, transportation and related services. Periodicals postage paid at New York, NY, and additional mailing offices.

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CHECKING IN

Felecia Stratton

by Felecia Stratton | **Editor**

The Supply Chain of the Past

On the previous page, the publisher talks about a coming global supply chain metastructure, citing an Adidas "speedfactory" where robots manufacture running shoes. Is this the supply chain of the future?

Maybe. But let's take a look at an imaginary supply chain of the past.

Meet Gan McManus, the hero of *Strikepoint*, a logistics novella we originally published in 2001. It's a fictional tale of one man's quest, in the face of sudden and explosive product demand for his company's special golf shoes, to find a logistics solution and save the company from financial ruin. His story starts on page 261.

Readers helped us decide to re-publish *Strikepoint* in this issue after research showed that it got more clicks and page views on the *IL* website—www.inboundlogistics.com—than any other article in 2015.

Why is *Strikepoint* still so popular 15 years after its original publication? And why is it important that you read it again, or for the first time, 15 years later?

Because its original purpose has not changed over the years – *Strikepoint* is a timeless celebration of your job. It shows how your company's ability to compete, survive, and grow is driven by logistics excellence.

Sure, today you can apply modern innovations, automation, and technology to drive supply chain success. But the true underpinnings of that success are practical experience and the drive to implement some tried-and-true ideas.

In *Strikepoint*, Gan perseveres without the kind of technology Adidas and other shoe manufacturers use today. He syncs his Palm Pilot, sets up phone calls with his stores to find out what inventory is selling and how much, and relies on Lexus Nexus when doing research. No Google for Gan. But he has the experience and knowledge to lead his supply chain team to success.

No matter what technology or automation you use in your supply chain, people still drive the process. For one example, check out Tony Bryant's story in Supply Chains That Rock Around the Clock (page 105). The Penske Logistics manager found himself in a seemingly impossible logistics bind, but some out-of-the-box thinking avoided additional costs and a customer service failure. No technology in the world would have thought of pressing a tow truck into service to rescue a stalled shipment.

While modern-day Gans rely on technology, and operate in an always on/never off supply chain, some solutions never go out of style. Logistics professionals—both veterans and newcomers—need a blend of technology expertise, real-world experience, and knack for innovation to manage a successful supply chain.

We can all prepare ourselves for the supply chain of the future by learning and building on the supply chain of the past. ■

inbound logistics

Vol. 36, No. 1 January 2016

THE MAGAZINE FOR DEMAND-DRIVEN LOGISTICS

www.inboundlogistics.com

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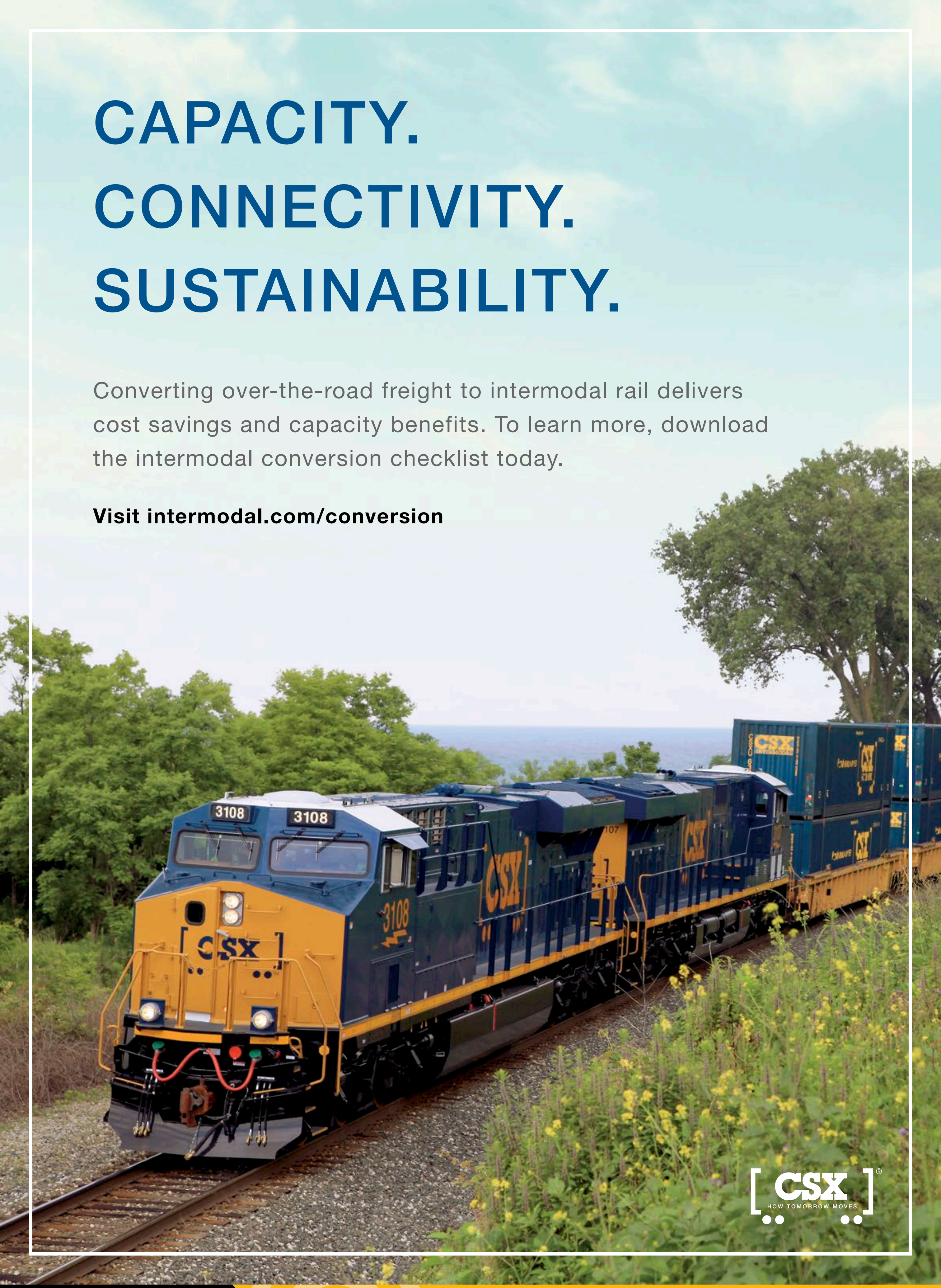
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HASH IT OUT

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Kevin Snobel Safety @KevinSnobel
Remember freight charges have to be paid first and become part of the claim.

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As e-commerce grows, so will the desire to deliver (and receive) orders quickly and cheaply. bit.ly/deliverquick

FIDELITONE @Fidelitone
We are now a society of instant gratification, don't you think?

EXCHANGE

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Logistics plays the role of a lifetime in helping retailers earn rave reviews for outstanding customer service performance. bit.ly/CSSuperstars

Frank Hooks
Customer service is vital to any business. I urge my delivery drivers to stay on top of their game at all times.

HOT TOPICS | *IL* articles getting the most impressions on LinkedIn: 10 Tips for a Successful Transportation Website: bit.ly/tipsforsite • 8 Ways to File Effective Freight Claims: bit.ly/FreightClaims • Global Trade Game Changer: bit.ly/canalexpansion • Supporting Sustainability Throughout the Supply Chain: bit.ly/greenscm • Attracting More Women to the Transportation Profession: bit.ly/womentransportation

READER EMAIL

Keep It Coming

I was encouraged by your November editorial, *Keep the Change*. I own a public relations agency and have gone through significant turnover. I've been trying to come to grips, asking myself: "Where did I go wrong? How did this happen? Should I give up and get a job?" I've had sleepless nights, emotional turmoil, you name it.

At any rate, I want to thank you for using precious column inches to share your experience and to let others know there is light at the end of all this. I finally found a great manager and have two wonderful specialists: one who has been with me for one year; another for one year next month.

It pays to stick in there—even when common sense tells you to find the nearest exit, right?

Again, thanks so much.

Ken Kilpatrick
Sylvia Marketing & Public Relations

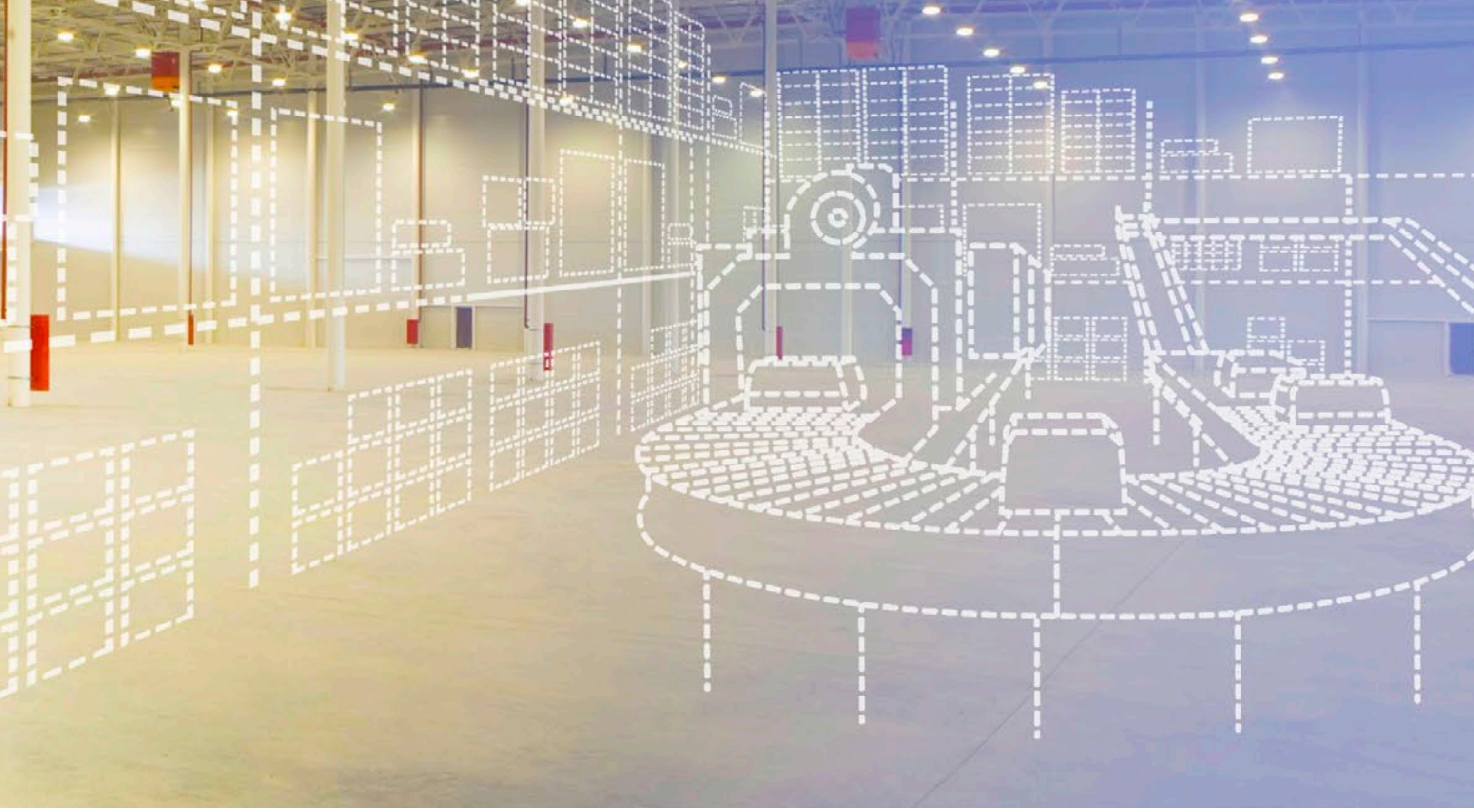
We appreciate your feedback. Please email comments (editorial@inboundlogistics.com) or tweet @ILMagazine.

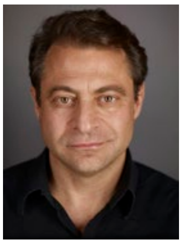
SOUNDBITE

"Logistics brings people, markets, and production closer together. As a global company, it is incumbent that we strongly advocate for the living conditions of those who don't benefit equally from globalization."

– **BERNHARD SIMON, CEO, Dachser SE**
on the company's work with humanitarian groups and efforts to expand aid to other countries

How is globalization affecting your corporate initiatives? Tweet @ILMagazine or tell us at editorial@inboundlogistics.com.





Good Question...

READERS WEIGH IN

Who's more important– your customers or your employees?

This one is easy for me: employees every time. Customers come and go, but it's employees who determine the frequency. Treat your employees well, invest in their skills, promote and reward customer-centric behaviors, and you'll never need to answer this question again.

Nick Foy
Director of Operations, ModusLink

Customers. A business can't survive without customers. The most successful companies focus on delivering experiences that consistently exceed expectations in addressing their customers' needs and have great employees who make it happen.

Glen Coates
CEO and Founder, Handshake

Frankly, the employee is more important since it is he or she who will be the key factor in retaining that long-sought customer. So while clients are certainly needed, only trained and dedicated employees will keep them.

Robert Walters
President, Freight Management

Twitter Verdict

In a Twitter poll,* Inbound Logistics *followers give customers the edge.

41% CUSTOMERS

26% EMPLOYEES

33% IT'S A DRAW

My employees will always be more important, because we are in the service industry. Our customers expect excellent service from us, and the only ones who can provide that are our employees.

Kristy Knichel
CEO/President, Knichel Logistics

Whether they are your employees or your customers, they are both an organization's stakeholders, who require attention, respect, and compassion to foster a long-term, profitable relationship.

Al Alper
CEO and Founder, Absolute Logic

Both should be equal. Happy employees make happy customers and happy customers keep us all in business, making for happy employees.

Janet Slivoski
Purchasing/Import Compliance Manager
The Great States Corp.
American Lawn Mower Co.

Happy and dedicated employees make for satisfied customers. Our commitment to the importance of employees is reflected in our actions after acquisitions. As a matter of course, after we have acquired a company, we view the new employees as the most important asset in the transaction.

Bob Shellman
CEO, Odyssey Logistics & Technology

They're both essential. Employees must be happy, well-trained, and supported in order to provide excellent service to customers. Customers must receive excellent service in order to keep coming back, which keeps the staff employed.

Mary Ann Krevh
Director of Client Services, TranSolutions

Healthy food produces healthy results. Happy employees produce happy customers. We capitalize both at GDC to reinforce our emphasis on who we work for.

Rob Moore
Warehouse Manager, GDC Technics

HAVE A GREAT ANSWER TO A GOOD QUESTION?

Be sure to participate next month. We want to know:

What's the first thing you would do to address the truck driver shortage?

We'll publish some answers. Tweet #drivershortagesolutions or tell us at editorial@inboundlogistics.com.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10 WAREHOUSES
1200 TRAILERS
800 TRUCKS

Becoming a Shipper of Choice

Supply chain partners are instrumental to business success. Taking steps to become a shipper of choice delivers benefits across the supply chain, and helps sustain and grow your bottom line. Greg Braun, senior vice president of sales and marketing at C3 Solutions, offers these tips for becoming carrier friendly.

1 **Offer a flexible delivery window.** Provide a flexible appointment window so carriers can better plan routes and optimize loads.

2 **Pay invoices on time.** Ask carriers what makes a preferred shipper, and their number-one answer is usually on-time payments. Everyone wants to get paid according to the terms of their contract.

3 **Give complete orders.** For prepaid freight from your vendors, just as with managed pickups, ensure you issue orders with clear instructions regarding your merchandising policy and scheduling appointments. Carriers are often frustrated when vendors and clients remit incomplete instructions. One option is to create a link on your company's website where carriers can easily obtain scheduling and policy procedures.

4 **Provide options for late drivers.** Accommodating carriers can go a long way in a relationship. For example, allocate an express door to take in loads on a first-come, first-served basis for drivers who didn't make appointment times.

5 **Supply a drop and hook program.** A drop and hook program, when a driver drops their trailer at a customer location and hooks to another trailer, is ideal when supply chain partners can't make live loading work efficiently. Securing your yard with 24/7 access for carriers and backhauls is a great way to help the flow of traffic in and out of your facility.

6 **Streamline driver arrival and departure times.** Minimize contention with carriers by offering an accurate and efficient system to capture arrival and departure times. The system should publish instantaneous reports to be shared with your partners.

7 **Avoid micromanaging carriers under contract.** Establish monthly or quarterly meetings to review issues including customer/vendor satisfaction, on-time reports, driver behavior, and routes. Micromanaging carrier actions isn't a productive way to steer the supply chain team toward a desired behavior pattern.

8 **Use a web-based portal for appointments.** An online portal allows supply chain partners to book or amend appointments or check on the status of bookings, at any time.

9 **Establish standing appointments for regular deliveries.** Work with your high-volume transportation providers to establish a regular time slot that will make their deliveries easier to plan.

10 **Treat carriers like customers.** Recognize that your carriers are supply chain partners and they deserve to be treated with the same respect as customers. Be friendly and responsive. ■

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READER

PROFILE

as told to Merrill Douglas

Al Morris is director, global supply chain, at TERiX Computer Service in Sunnyvale, Calif. He has worked for the company since 2004.

RESPONSIBILITIES

Procurement and logistics.

EXPERIENCE

Procurement manager, Marathon International Group.

EDUCATION

BS, Private and Commercial Recreation, San Jose State University, 1991.

Al Morris: Perfect for the Part

I GRADUATED COLLEGE DURING A RECESSION, AND WAS glad when a friend offered me a temporary warehouse position at Marathon International Group, a Sun Microelectronics reseller. My first job was getting products ready to go out the door. Eventually, Marathon offered me a permanent position. It was a small company, but when the dot.com explosion hit, it grew from $2.5 million in revenues to $32 million in one year. I learned project planning, and then I started working with manufacturing and imports. Next, I got into procurement.

TERiX is an independent provider of maintenance services for data centers. I joined the company to help it gain better control of its parts inventory. At the time, we had a contract with AOL, supporting three gigantic data centers, each the size of a football stadium. We had to replenish products daily.

We kept service parts in a few distribution centers, which we owned, and shipped them as needed to locations across the country. Before long, I led an effort to redesign that system. We developed forward stocking locations to keep parts closer to customers. We also started using third-party logistics companies in geographies closer to our customers. This strategy has helped reduce delivery times and improve service metrics.

Today, we have about 58 regional stocking facilities around the world, many of them run by Network Global Logistics or DHL. We still own a few sites, including three in Japan and our main distribution center in California. In some countries,

The Big Questions

How do you like to spend time outside of work?

I enjoy getting together with family and friends, especially for our extended Italian cooking events. We celebrate our family heritage and try to re-create my grandmother's recipes.

What's one characteristic every leader should possess?

The ability to understand how your decisions affect the rest of the company, and how corporate decisions affect your department. You need to comprehend the big picture and be able to explain those connections to your team in order to get buy-in.

If you were shipwrecked on a desert island, what music would you want to have with you?

Country, 80s, 60s surf music, swing. I'm still a big fan of Pink Floyd and Kansas. I also love contemporary music.

we work with local service partners and keep the spare parts at their locations. The new model reduces fixed costs and is scalable, which allows us to move quickly into new markets.

On the procurement side, I review our accounts and verify the parts we're most likely to need for each contract. I look at locations, costs, and expected failure rates to determine which parts to buy, in what quantities, and where to stock them. My unofficial department goal is to make sure a service engineer goes to a customer site with the necessary part on the first visit at least 95 percent of the time, within the terms of the service level agreement.

One of the hardest aspects of the job is learning about new product lines. While we worked mostly on servers and storage systems in the past, we now also service network equipment. We have to become familiar with new products and determine which parts may fail. Each original equipment manufacturer has its own patterns.

Observing those differences taught us to avoid a cookie-cutter approach for inventory planning. We start with our assumptions about failure rates, but then collaborate with vendors and other suppliers, leveraging their knowledge about how parts have performed over a specific time period. The more research we do, and the more we learn about the systems, the better we're able to forecast demand and deliver on our goal to provide the right part the first time. ■

LEADER*SHIP*

Conversations With The Captains of Industry

By Merrill Douglas

Bob Shellman
CEO
Odyssey Logistics & Technology

Steering With a Clear Vision and Open Mind

BOB SHELLMAN LIKES TO KEEP THINGS NIMBLE. Starting his career in the 1970s at Union Carbide, a global company with more than 100,000 employees, he discovered that he didn't love the environment of a large corporate bureaucracy. So when he had the chance to take the principles behind the company's UniGlobal Logistics subsidiary and apply them to a new, privately owned logistics startup, he grabbed it. The third-party logistics (3PL) company he founded, Odyssey Logistics & Technology, has been thriving, growing, and seizing new opportunities ever since.

LIFE ON THE WATER

Outside of work, Bob Shellman is primarily a golfer and a boater. "I have been boating all my life," he says. "My two daughters were certified and licensed to operate motor boats in their early teens." During the spring, summer, and fall boating seasons, you'll find him cruising Long Island Sound with family and friends as often as possible.

"I also play guitar and used to be in a rock-and-roll band," Shellman adds. "But those days are over."

***IL:* What leaders inspire you, and why?**

I've always been inspired by entrepreneurs such as Steve Jobs. They taught me the importance of avoiding bureaucracy, so people are freely able to challenge the status quo every day.

Leaders need to get rid of the hierarchy associated with corporate organizational structures—flatten the organization, so they receive communications at the top from all levels. When someone at the bottom has a great idea, the last thing you want is for that idea to get filtered on its way up to the leadership team; you want to receive it directly.

***IL:* In your professional life, have you learned any specific lessons that left an indelible mark?**

As global director of purchasing, transportation, and supply chain at Union Carbide, I had the opportunity to work with most of the company's operating groups. I noticed a huge gap in the services available in the global logistics space. At the time, no single provider could service all modes globally.

This is inefficient. If thousands of suppliers around the world are providing different services, there's no technology you can deploy that helps you to understand, monitor, and improve all those activities. A single source with capabilities across all modes globally provides control and understanding of the supply chain. That creates the best environment for driving process improvement.

I was able to convince the parent company, Union Carbide, to form a subsidiary, organized and staffed to provide a complete portfolio of transportation services to all the global operating units and joint ventures. The company was named UniGlobal, and I served as CEO.

We deployed both domestic and

international services for the Union Carbide business units, and signed major contracts with several Fortune 100 companies. The vision was to spin off UniGlobal as an independent, neutral entity, which would offer the greatest opportunity for UniGlobal's growth.

This experience taught me that the keys to success are identifying a need in the market, and determining how to fill that need in a way that creates barriers to entry, so that others find it difficult to compete. Our secret sauce was a global logistics technology platform and global services across all modes, giving clients a single supplier/partner to fulfill all their requirements.

IL: How have your experiences at Union Carbide and UniGlobal shaped your strategy at the helm of Odyssey?

Leaders need to be prepared for the unexpected. In the middle of the spinoff discussions, Dow Chemical acquired Union Carbide, making a spinoff impossible. That prompted my decision to leave and form a startup company in 2002. Odyssey Logistics & Technology would provide the same services UniGlobal was offering.

I suddenly found myself in a unique position: I was launching a new company, I had no customers, only five employees, and needed at least $30 million in capital to make it work. In that position, you can't go to a traditional bank or private equity. The amount required was too large for an angel investor, so the path to funding had to be the venture capital markets. My sales pitch to investors worked; we were oversubscribed.

IL: Odyssey has experienced consistent double-digit growth for 13 years. How have you maintained such aggressive growth?

In an economy where GDP growth averages two percent or less each year, the only way you can grow at our rate is to make acquisitions in unique markets that will build up additional service capability. Each acquisition has to conform to our core thesis—we operate in large markets, providing services where there are complex requirements, resulting in barriers to entry and limited competition.

One key to our continued track of success is our pool of talented employees. And many of our most valued employees have come to us through the acquisitions. When we acquire companies, we gain entrepreneurs, because the founders and the senior leadership teams often stay on the payroll. With few exceptions, those senior leaders are still on the payroll today. We get the most from those leaders by encouraging them to innovate, and to constantly look for better ways to do things. You'll never get in trouble at Odyssey for making a mistake while questioning the existing state of affairs. We have to constantly improve and innovate our processes.

IL: What's the most challenging aspect of your growth model?

The most difficult thing is finding the right companies, and helping them reach a position in which they're willing to be acquired. Odyssey has never acquired a company that was already for sale. We look at the top companies that are the best fit for the Odyssey business model. We get to know their leadership teams, and then, over time, convince them that being acquired by Odyssey is the right thing.

IL: Knowing what you know today, what advice would you give your 20-something-year-old self?

Stick to your vision, but be open to opportunity. A good example of that came in 2015, when Odyssey launched a new, no-fee service, Web Integrated Network (WIN). The idea came up during one of our senior team's regular brainstorming sessions. We were talking about companies such as Blockbuster and Borders Books, which were blindsided by the rise of new technologies such as streaming movies and e-readers.

In Odyssey's case, companies constantly asked if they could use our global transportation management system platform to operate their own networks. In the past, that never seemed possible, but new technologies offered an opportunity. We developed a multi-tenant Software-as-a-Service offering in the cloud, giving shippers access to our technology environment, to automate their processes and drive optimization. When we deployed WIN, we thought we'd have 12 or 13 pilot clients. Currently, 130 companies are signed up to use it.

IL: What is the reasoning behind your strategy of going into big markets with significant barriers to entry? What motivates you?

Odyssey's heritage is in chemicals, which is one of the most difficult sectors of logistics, due to complex product characteristics. Few competitors have the staff and equipment to safely and effectively support chemical needs—thus the barrier to entry. Because we offer highly skilled services for challenging logistics needs, the margins are better than on more generic or commodity-type logistics services. Our acquisitions have been of a similar nature; we have acquired companies and organizations that have the skills and/or equipment required to meet the specialized needs of big markets.

IL: How do you manage all the information coming your way?

First, I stay close to my customers. What they experience and feed back to us matters most and helps us stay ahead of trends. We meet with customers to review what's going on at Odyssey, what's going on in their business, and what's going on in the marketplace. Our focus is global, as we have followed our customers to Europe and Asia. ■

NOTED

THE SUPPLY CHAIN IN BRIEF

m&a

CABKA, a supplier of sustainable plastic pallets and boxes, acquired **Systec Mixed Plastics GmbH**, which manufactures plastic granules from post-consumer waste in Europe. The company operates under the new name CABKA GmbH Genthin. With the takeover, CABKA expands its raw material capacity by nearly 50,000 tons and strengthens its EcoProducts business.

Materials handling company **Dearborn Mid-West** acquired **W&H Systems**, an integrator of materials handling systems, combining the company with its Material Handling Systems Division and rebranding as DMW&H. The new entity designs, integrates, installs, and supports materials handling systems, with a focus on the wine and spirits, e-commerce, retail, industrial, and food/beverage industries.

Southworth International Group, a provider of ergonomic materials handling equipment, acquired **Marco Group AB**, a manufacturer of similar lifting and positioning technologies in Sweden. The transaction extends Southworth International Group's market capabilities and accelerates the buildout of European and Asian operations.

Dematic, a supplier of integrated automated technology, software, and services to optimize the supply chain, acquired **Reddwerks Corporation**, a warehouse execution software provider that offers real-time decision engines to optimize material and information flow in the supply chain. The acquisition enhances Dematic's existing software suite, and delivers additional value to its solutions for shippers.

DM Fulfillment, a fulfillment and distribution provider and a division of Distribution Management, acquired **Premier Distribution Management**, which operates as a Foreign Trade Zone and specializes in international distribution and mailing services. The move enhances DM Fulfillment's international capabilities, supporting speed to customer or shelf both domestically and into key markets such as Canada, Europe, and Australia.

Transportation Insight, a 3PL provider, acquired **BirdDog Solutions**, a provider of parcel logistics solutions. The transaction advances Transportation Insight's small package offering to include parcel logistics optimization, parcel auditing, and advanced parcel analytics.

UP THE CHAIN

Jeff Harris was named chief financial officer of specialty coffee and tea retailer **The Coffee Bean & Tea Leaf**. In this new role, Harris oversees the company's supply chain and all financial functions. The coffee chain recently opened new stores in Paraguay, Bangladesh, and Japan, and is expanding into China with the launch of 700 stores through 2026.

The Boston Beer Co., brewer of Samuel Adams beers, tapped veteran food industry executive **Quincy Troupe** as senior vice president for its supply chain. Troupe spearheads the company's efforts to expand and adapt to changes in the beverage industry, which has experienced a proliferation of craft brewers and consolidation among mass-market providers.

GREEN SEEDS

▲ **Ryder System** is switching the fuel at its stations in Orange and Fontana, Calif., to Clean Energy Fuels Corp.'s Redeem renewable natural gas, a fuel made entirely from organic waste. The move reduces greenhouse gas emissions by approximately 6,300 metric tons per year using current fuel volumes—the equivalent of removing approximately 1,319 passenger cars from the road annually.

NFI, a supply chain solutions provider, launched a natural gas-fueled, dedicated fleet in central Florida. The new fleet consists of 12 compressed natural gas trucks, serving transportation operations for a national home improvement retailer in the region. The fleet is expected to reduce greenhouse emissions by nearly 20 percent for the regional operation.

The **UPS Foundation**, the philanthropic arm of UPS, committed to funding the planting of 15 million trees by the end of 2020. Since 2012, The UPS Foundation and its environmental partners have planted more than five million trees in 46 countries. The UPS Foundation also awarded more than $2.5 million in grants to 12 non-profit organizations dedicated to environmental sustainability.

recognition

XPO Logistics, a provider of transportation and logistics solutions, received the **2015 Mid-Size Truckload Carrier of the Year Award** from The Home Depot, a retailer of home improvement and construction products and services. XPO's truckload transportation business, formerly Con-way Truckload, was honored for the quality of service provided to The Home Depot's distribution centers.

Kenco Transportation Services, a provider of integrated logistics solutions, nabbed the **2015 President's Trophy** in the Under 25 Million Miles category in the annual competition sponsored by the American Trucking Associations. The award honors the provider's comprehensive safety program.

Old Dominion Freight Line was awarded the ATA Transportation Security Council's **2015 Excellence in Claims and Loss Prevention Award**. The honor is given annually to the company with a consistently low ratio in cargo claims and a proven loss prevention program. Award criteria include claims filed, number of days to conclude a claim, claims ratio, loss prevention education, delivered error ratio, and claims filed per shipment.

◀ Transportation provider **Holland** received the Parker Hannifin **2015 LTL Carrier of the Year Award**. Parker Hannafin, a manufacturer of motion and control technologies, recognized Holland's commitment to operational excellence and continuous improvement, basing the award on measures such as on-time service, claims performance, continuous improvement participation, electronic data interchange invoicing compliance, billing accuracy, and customer service.

SEALED DEALS

Pharmaceutical company **GlaxoSmithKline** (GSK) signed an end-to-end global logistics partnership with **Kuehne + Nagel** that will see the logistics solutions provider transport GSK's products from the raw materials supplier to trade customers until 2021. Kuehne + Nagel provides GSK with a global logistics solution to encompass its suppliers, large number of manufacturing units, and multiple routes to patients and consumers in more than 100 countries.

◀ For the second year, **Girl Scouts of the USA** tapped **Evans Distribution Systems** to ship more than one million packages of cookies placed via its newly enhanced *Digital Cookie* platform out of Evans' Detroit-based fulfillment center. *Digital Cookie 2.0* provides Girl Scouts the opportunity to sell cookies on a personalized website or mobile app, and Evans fills the orders.

DECATHLON, a sports and leisure goods retailer, partnered with **Checkpoint Systems**, a supplier of merchandise availability solutions, to roll out radio frequency identification (RFID) solutions in more than 400 stores globally, and further extend its RFID source tagging program for millions of products in all its stores. The large-scale deployment of RFID technology improves DECATHLON's merchandise availability and boosts loss prevention efforts.

Hermes, a specialist in business-to-consumer deliveries, secured a two-year extension to its contract with shoe manufacturer and retailer **Clarks**. Under the terms of the contract, Hermes continues delivering online purchases to consumers throughout the United Kingdom. Hermes has delivered approximately 3 million parcels for Clarks since winning the contract in 2012.

Medical device manufacturer **medi Manufacturing** streamlined data collection and improved quality assurance with enterprise quality management software *ProFicient* from provider **InfinityQS International**. The solution helped the manufacturer save 300+ man-hours per year, drive continuous improvements, maintain compliance, and achieve ROI in 10 months.

Port Logistics Group, a provider of gateway logistics services, signed a multi-year service agreement with **American Essentials**, a subsidiary of McGregor Industries, a maker and marketer of men's, women's, and children's socks and legwear. Port Logistics Group provides warehousing, inventory management, value-added services, and regional transportation to support American Essentials' North American distribution.

GOOD WORKS

▼ During the 2015 holiday season, **DHL Express** delivered hundreds of fresh-cut Christmas trees, along with thousands of holiday letters, menorahs, decorations, and gifts to U.S. troops serving in Afghanistan, Bahrain, and Kuwait. For 12 consecutive years, DHL Express has teamed up with the New York community for Operation Holiday Cheer, a program that helps U.S. troops celebrate the holidays while serving abroad.

▲ Supply chain solutions provider **Panalpina** joined forces with UNICEF to fly much-needed relief goods to Burundi, an African country where a recurring crisis has caused violence and a shortage of essential drugs. Panalpina chartered a cargo aircraft with 70 tons of primary medical care goods such as antibiotics, analgesics, infusion sets, and hospital equipment, provided by UNICEF.

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GOOD WORKS

Arpin Van Lines transported 6,354 wreaths from Columbia Falls, Maine, to Arlington National Cemetery, in memory of veterans during National Wreaths Across America Day on Dec. 12, 2015. At Arlington, van operator Steven Meyer and his wife Angie, who volunteered on behalf of Arpin Van Lines, helped unload and place the wreaths at gravestones with the aid of active members of the Armed Forces, veterans, families, and community volunteers.

SHOVEL READY

▲ **FedEx Ground**, the small-package ground delivery unit of FedEx, is building a 300,000-square-foot distribution facility (*rendering above*) at the new Tradepoint Atlantic global logistics center at Sparrows Point in Baltimore, Md. The facility is scheduled to open in August 2017 and is part of FedEx Ground's ongoing nationwide network expansion plan that has resulted in the addition of 11 major hubs and the expansion of 500 facilities since 2005.

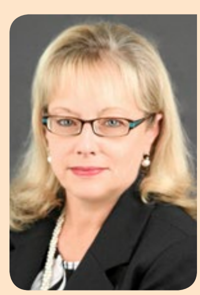
S&S Activewear, a promotional apparel wholesaler, is locating a new distribution center in Olathe, Kansas, creating 200 jobs in the Kansas City region. S&S Activewear is set to occupy a 473,000-square-foot shipping and receiving facility at I-35 Logistics Park. The new location expands the company's one-day ground shipping transit area to include Kansas, Missouri, Oklahoma, North Texas, and part of Colorado.

◀ Real estate finance and investment management firm **PCCP** and **Dermody Properties**, a national industrial development and operating company, started construction on the first facility in LogistiCenter, a 130-acre park with a planned 1.6 million square feet of industrial space. Located at 8730 Military Road in Reno, Nev., the first facility is planned for 722,512 square feet with completion anticipated for May 2016. Jarden Technical Apparel, which is made up of Marmot and ExOfficio, has pre-leased 270,000 square feet of the first facility in LogistiCenter.

recognition

▲ **Averitt Express**, a provider of freight transportation and supply chain management, was named one of automaker Honda Motor Company's **2015 Premier Partner Award** recipients. Averitt was the only LTL provider to be nominated in 2015, and was recognized for providing superior performance and unique supply chain solutions, from LTL transportation to intermodal services.

Third-party logistics provider **C.H. Robinson** was named the **2015 Carrier of the Year** by the Jel Sert Company, maker of dessert mixes, drink mixes, and freezer bars. The accolade recognizes C.H. Robinson's freight transportation and logistics solutions, based on criteria such as customer service, on-time pickup and delivery, and ease of doing business.



◀ The Intermodal Association of North America's president and CEO **Joni Casey** was honored with the Containerization & Intermodal Institute's **2015 Lifetime Achievement Award**. The recognition acknowledges an individual's long-term career commitment to the field of logistics.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Of Potholes and Politics

by Jason McDowell

Transportation infrastructure became a hot topic at the end of 2014. So hot, in fact, that it was on the short list of items that had Congress prepared to shut down the government again.

This was an interesting development for those who depend on our nation's highways and waterways – especially because there was little sign that the issue was going to receive appropriate attention before the 2016 presidential election. After all, Congress and the Obama administration have consistently kicked the transportation funding can down the highway since the last long-term spending bill expired in 2009.

In December 2015, both houses of Congress passed a five-year, $305-billion transportation spending bill—known as the Fixing America's Surface Transportation (FAST) Act—finally allowing local, state, and federal government planners to plot out much-needed highway, bridge, rail, and waterway repairs. The bill includes language to streamline processes for new transportation projects, and establishes programs for critical freight projects.

To the freight sector's advantage, the FAST Act will "establish both formula and discretionary grant programs to fund critical transportation projects that would benefit freight movements," according to the Department of Transportation's website.

But still, with such a long gap between transportation spending bills (the bill that expired in 2009 was passed one decade ago in 2005), the measure falls flat. "This is far short of the amount needed to reduce congestion on our roads and meet the increasing demands on our transportation systems," says a Department of Transportation press release.

The American Society of Civil Engineers (ASCE) agrees. The ASCE's *Report Card for America's Infrastructure* gives America's infrastructure a cumulative grade of D+. The Obama administration had hoped for a bill that would increase spending by 45 percent over five years, but the FAST Act increases spending by only 11 percent, according to a White House statement.

With the current political climate in the United States, it seems lucky that a bipartisan bill passed through Congress at all. This will likely be the last action taken on the issue while President Obama is in office, so transportation, logistics, and supply chain professionals must look to the country's next president to lay out an additional long-term funding plan for maintaining the U.S. transportation network.

To this end, here's a look at what some 2016 presidential candidates are saying about transportation infrastructure.

■ **Hillary Clinton.** Democratic frontrunner Hillary Clinton released a transportation plan of her own, citing a $250-billion budget on top of the FAST Act that would "improve the country's rural transportation, water, and broadband infrastructure," as well as improve electrical grids, according to her campaign's website.

On top of the $250 billion, $25 billion would be put into an infrastructure bank to support an additional $225 billion in loans, guarantees, and other forms of credit enhancement. Clinton's plan cites that it will be paid for through "business tax reform," but isn't specific on the details.

■ **Bernie Sanders.** The Vermont senator proposed the Rebuild America Act, which would invest $1 trillion over five years to modernize U.S. infrastructure. Sanders intends to pay for this plan by closing corporate tax loopholes that allow corporations to keep money in overseas tax shelters such as the Cayman Islands.

■ **Donald Trump.** The Republican frontrunner sees the issue as crucial. "The infrastructure of our country is a laughing stock all over the world," Trump said in an April 2015 Facebook video. "Our airports, our bridges, our roadways – they're falling apart. It's a terrible thing to see." In a more recent October 2015 interview with *The Guardian*, Trump pushed the importance of spending federal money on mass transit and other infrastructure. "We have to fix our airports and fix our roads, in addition to mass transit, but we have to spend a lot of money," he said. To date, Trump's campaign has not released a specific plan to finance an infrastructure overhaul.

■ **Jeb Bush.** The Florida governor hasn't released a federal transportation policy. In Florida he fought against large-scale projects such as high-speed rail, but also raised the transportation budget year-over-year between 2001 and 2009 a total of 96 percent.

■ **Ben Carson.** He currently has no public platform regarding transportation.

■ **Chris Christie.** The New Jersey governor has no federal plan, but his state struggled throughout 2015 to fund the final year of Christie's five-year transportation plan. Christie fought against raising the gas tax in the state, instead selling bonds to cover the final year's costs.

■ **Ted Cruz.** The senator's campaign doesn't list a transportation plan, but he was a co-sponsor of the Transportation Empowerment Act (TEA) in June 2015, which would have lowered federal involvement in transportation funding and transferred the majority of infrastructure responsibility to the states over five years.

■ **Carly Fiorina.** "Infrastructure is a federal government responsibility, actually. We must invest in our roads and bridges and infrastructure," said the former corporate CEO during an interview on RFD-TV's Rural Town Hall. Her campaign hasn't released specifics.

■ **Rand Paul.** His campaign hasn't published a transportation policy, but in early 2015 the senator co-sponsored legislation that would have paid for transportation infrastructure projects and policy reform through a tax holiday encouraging companies to repatriate to the United States from overseas.

■ **Marco Rubio.** The senator lists a sparsely detailed plan on his campaign website to repair the nation's infrastructure.

Is Amazon About to Take Off?

While many retailers operate their own cargo fleets, most keep their wheels planted firmly on the ground. But if you believe the rumors, Amazon's cargo fleet might soon be flying the friendly skies.

If there is any company that's always down to try something radical, it's Amazon. The retailer is currently in negotiations to lease 20 Boeing 767 fleets to move its own packages between warehouses and fulfillment centers around the United States, according to *The Seattle Times*. The purchase would significantly expand the company's secret pilot air cargo operation that allegedly runs through Air Transport International and ABX Air out of Wilmington Air Park in Ohio.

If Amazon is really building its own air network, it seems likely to be in response to the 2013 holiday season debacle in which third-party parcel carriers, held back by inclement weather and a large increase in online shopping, left large numbers of Amazon customers without packages under the tree on Christmas morning.

If Amazon can get an air cargo fleet successfully off the ground, the options for the e-tailer will be as endless as the skies those planes will fly through. Once the operation is established, carriers such as the U.S. Postal Service, UPS, and FedEx stand to lose a significant amount of business. It's even possible that the company might start offering third-party services and become competition for the other large carriers. As usual, for Amazon, the sky is the limit.

With the implementation of its Prime Now delivery service, and increased contracts with smaller carriers, Amazon has proven that it's not afraid to take packages out of the hands of large third-party carriers and deliver them on its own.

Supply Chain Sustainability: Priority or Luxury?

The customer is always right...right? This old adage doesn't seem to ring true if the customer demands sustainability. More than 50 percent of consumers are willing to pay at least an additional 5 percent if a product is manufactured sustainably, and 76 percent are willing to wait an extra day for their purchase if it's shipped in a climate-friendly way, according to a study from West Monroe Partners and Supply and Value Chain Center of Loyola University Chicago.

Despite this trend among consumers, 49 percent of surveyed supply chain executives don't view sustainability as a strategic priority, according to the same survey. The study concludes that while there is interest in sustainability among supply chain executives, the budget and resources to implement new programs don't exist.

"Most supply chain teams are struggling to manage the complexities of globalization, the war for talent, and increasing demands, so allocating budget and resources toward sustainability doesn't seem feasible unless companies can put together a business case for the return on the investment," says Yves Leclerc, managing director at West Monroe Partners.

IS A GREEN SUPPLY CHAIN A STRATEGIC PRIORITY IN YOUR ORGANIZATION?

6% – Will be in > 5 years
8% – Will be in 3–5 years
22% – Will be in 1–3 years
12% – No
51% Yes, currently a strategic priority

Source: West Monroe Sustainability Survey

For the 51 percent of executives who do prioritize sustainability, motivations appear to be chiefly about brand image and competitive advantage. But of that number, still only 37 percent have dedicated sustainability individuals or teams.

Unfortunately, sustainability measures aren't always cost effective. It seems likely that many companies won't make a move to be more sustainable until forced to do so by regulation.

O, Drivers Where Art Thou?

With 2015 in the history books, the trucking industry now finds itself short approximately 48,000 drivers, according to an American Trucking Associations (ATA) report. This is up from a shortage of 38,000 drivers in 2014, and if nothing gets in the way of current trends, the industry could be looking at a shortage of 73,500 by the end of 2016, and numbers as high as 175,000 by 2024, the report says.

It is possible that the shortage might not be as bad as it appears. It's not that people aren't applying for driving jobs, it's that companies aren't getting enough interest from qualified applicants. The applicants are there, but carriers hesitate to hire underqualified drivers because they then face higher insurance premiums and accident rates, among other problems. Nearly 88 percent of fleets responding to a 2012 ATA survey said that most applicants weren't qualified.

The trucking industry will need to hire about 89,000 drivers every year for the next decade, according to the ATA's survey. Replacing retiring truck drivers will account for about 45 percent of new hires, with industry growth trailing at about 33 percent of new hires.

The for-hire truckload sector is hit hardest by the shortage. Private fleet and less-than-truckload (LTL) drivers often receive higher pay and more time at home, so they tend to stick around. If long-haul drivers don't leave the industry altogether, they usually transition into these roles (though even these sectors are also starting to feel the driver pinch).

As we watch the driver shortage numbers climb year over year, it's time to start doing something about it. The ATA recommends that the transportation sector work together to take the following actions before the shortage spirals out of control:

■ **Increase driver pay.** Sign-on bonuses, driver pay, and compensation packages have steadily improved over the past two years. High starting salaries should consistently draw new drivers into the field.

■ **Enable more time at home.** The supply chain must strategically locate facilities in ways that give drivers as much time at home as possible. Much of the driver turnover comes from truckers who simply want to see their families more. If companies can provide this benefit, it's more likely that drivers will stay working in the industry.

■ **Lower the driving age.** Drivers younger than 21 cannot currently cross state lines behind the wheel of a commercial vehicle, leaving drivers between the ages of 18 and 21 unemployable by long-haul carriers. Removing this restriction would greatly expand the available driver pool.

■ **Improve public perception.** Seek out opportunities to influence the public view of trucking as a career in a positive manner. Companies should also make efforts to recruit demographics who don't typically look at the profession, such as women, who make up only 6 percent of commercial vehicle drivers.

■ **Recruit former members of the military.** Initiatives are in place to hire 100,000 transitioning veterans as drivers over the next two years. Many veterans already have the skills necessary to get behind the wheel of a big rig, and only need the civilian certification.

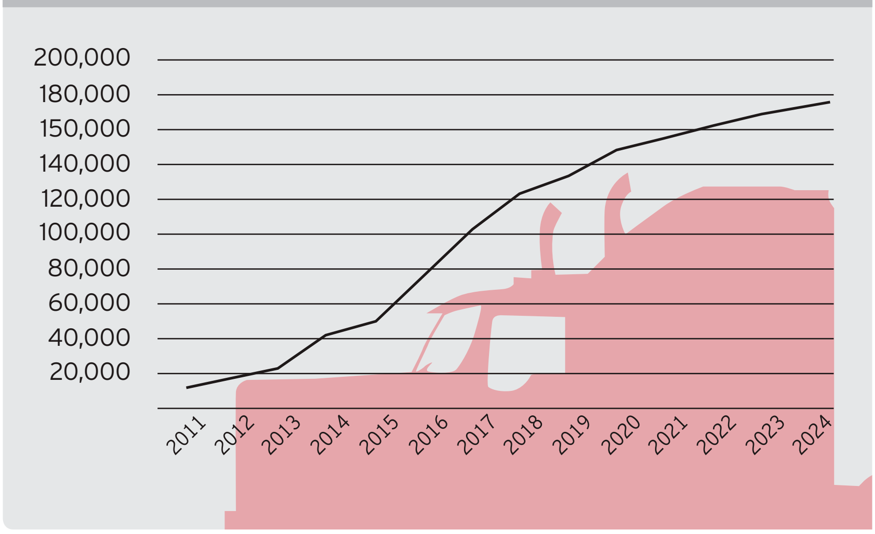
■ **Treat drivers better in the supply chain.** Drivers often complain about poor treatment at shipping and receiving facilities. Companies should encourage employees to treat drivers with respect, streamline processes to reduce wait times, and provide areas for truckers to relax while on site.

■ **Fast-track research on autonomous trucks.** Autonomous trucks are still years away. While perhaps the industry can't depend on automated help in the next few years, it is likely that driverless trucks will be on the road at some point, relieving strain on the long-haul driver pool.

TRUCK DRIVER SHORTAGE CONTINUES TO CLIMB

In 2014, the trucking industry was short 38,000 drivers, according to the American Trucking Associations. The shortage is expected to reach nearly 48,000 by the end of 2015. If the current trend holds, the shortage may balloon to almost 175,000 by 2024.

SOURCE: ATA Truck Driver Shortage Analysis 2015



The Long Haul Gets a Little Shorter

A trio of drivers claimed a new transcontinental driving record in October 2015. They clocked the 2,995-mile trip from Los Angeles to New York at 57 hours, 48 minutes. The time is impressive, but it's still more than 25 hours longer than the current record for the trip. But the devil is in the details.

This was the first successful cross-country trip that a vehicle made almost completely on autopilot. Drivers Carl Reese, Deena Mastracci and Alex Roy, all former transcontinental record holders, took the trip in a Tesla S P85D that featured Tesla's new autopilot system.

The semiautonomous technology allows for hands- and pedal-free highway driving, lane changes, throttle adjustments, and steering and braking based on sensor scans. While this impressive (and probably illegal) trip has little to do with the supply chain right now, the implications for logistics applications are obvious.

This feat comes on the heels of Daimler's self-driving trucks beginning road testing on Nevada highways in summer 2015. While all self-driving cars and trucks currently require a driver behind the wheel in case something goes amiss, it suddenly doesn't seem so farfetched that a few years into the future we might have cars and trucks cruising down our highways with no human aboard at all.

A team recently drove cross-country without touching the pedals or steering wheel in a Tesla Model S P85D equipped with an autopilot system.

Shippers Rail Against Railroad Mergers

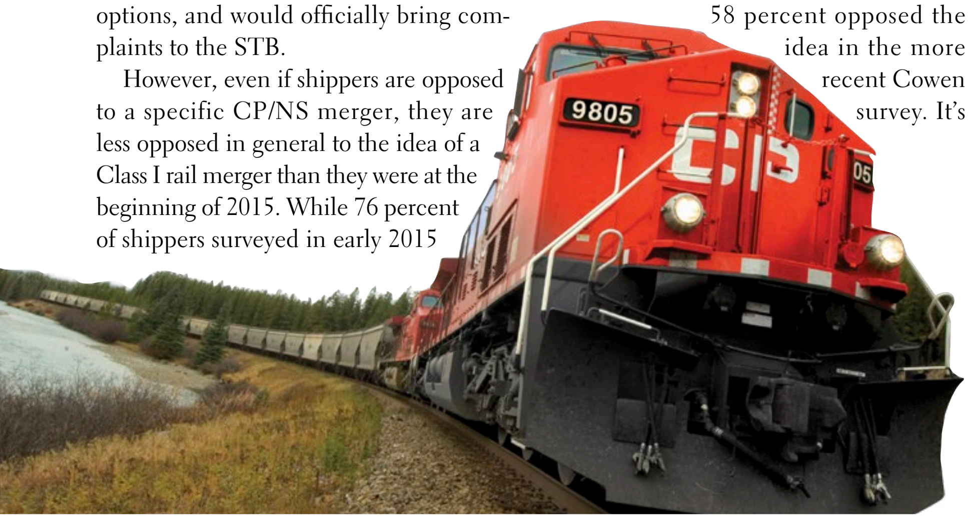
Shippers have long memories, so it's not hard for supply chain and C-suite executives to look back through the years to the 1990s and before, when a series of mergers by Class I railroads caused endless problems in the form of derailments, lost shipments, and even accidental deaths. Things got so bad that regulatory agencies wound up passing a series of measures to make large rail mergers "bear a heavier burden to show that a major rail combination is consistent with the public interest," according to the Surface Transportation Board (STB).

But these hurdles aren't stopping Canadian Pacific (CP) from trying. The latest of three successive offers to buy Norfolk Southern (NS) carries an impressive price tag of $28 billion.

Even if shareholders are all aboard, which at this point doesn't seem likely, shippers most certainly are not. Seventy one percent of shippers are against the merger, according to a survey by Cowen and Co. So CP and NS would face not only regulatory hurdles, but a challenge from their customer base as well. Of those opposed in the survey, more than half said they fear higher prices and decreased options, and would officially bring complaints to the STB.

However, even if shippers are opposed to a specific CP/NS merger, they are less opposed in general to the idea of a Class I rail merger than they were at the beginning of 2015. While 76 percent of shippers surveyed in early 2015 opposed the idea of a Class I merger, only 58 percent opposed the idea in the more recent Cowen survey. It's possible that if CP bides its time, at least the customer complications might subside.

Considering Norfolk Southern's rejection of the two previous offers, however, it doesn't seem likely that an acquisition would begin soon, if at all. Even if NS accepted CP's offer, investigations and regulatory approval would take more than a year and a half—and that's if everything went smoothly. Considering the complicated nature of such an acquisition, that doesn't seem very likely either. Still, the fact that the conversation about Class I railroads merging is even happening at all makes plenty of people nervous.



Hoverboards Come Under Fire

Hoverboards (they don't really hover – they are a type of scooter) were expected to be one of the hottest holiday gifts of 2015. And they were—very hot—because in some cases the boards spontaneously burst into flames.

Amid the holiday hustle and bustle, Amazon, Target, and other major retailers were forced to holiday rush many hoverboard brands right off the shelves and away from consumers, based on whether or not the manufacturer could prove the product met safety standards for lithium ion batteries and other safety criteria. The U.S. Postal Service and several major airlines began refusing to carry the products in their planes at all.

The Consumer Protection Safety Commission (CPSC) began investigating the product after a dozen complaints about hoverboards spontaneously catching fire were verified. "I have directed agency staff to work non-stop to find the root cause of the fire hazard, how much of a risk it might present, and to provide consumers with answers as soon as possible," said CPSC Chairman Elliot Kaye.

The hoverboard problem speaks to a wider issue in American manufacturing: The ease with which U.S. companies can source products from unregistered manufacturers overseas in places like China. While holiday sales surged, and patent battles raged between larger hoverboard manufacturers such as Razor and Swagway, many knock-off hoverboards – built without appropriate safety standards – found their way into the country completely under the radar through online sales.

Consumers can be fairly confident that the CPSC will eventually get to the bottom of the hoverboard problem and pass rules to keep future scooter fires to a minimum. But responsibility also lies with U.S. retailers and manufacturers to look inside their own operations and make sure that the parts they use or the products they sell are from reputable sources. Often the cheapest source of components or finished products is not the best option. As the old saying goes, if it looks too good to be true, it probably is.

For Truckers, Print is Finally Dead

Many old school truckers are busy trying to use up the last of their pencils, pens, and paper logbooks. The Federal Motor Carrier Safety Association (FMCSA) finally set a deadline for the long-awaited rule requiring trucking companies to install electronic logbooks in all their vehicles.

While many carriers aren't thrilled about the change, with most citing expense as their largest complaint, the FMCSA says that e-logs will make things easier in the long run. Not only will carriers have better access to data to improve productivity in the back office, but life out on the road should get easier for drivers as well.

With e-logs in every truck, drivers will be forced to comply with Hours-of-Service (HoS) rules, designed to reduce driver fatigue. Additionally, drivers will spend less of their off hours on logs and paperwork, giving them time to get more rest.

The American Trucking Associations (ATA) supports the mandate. "ATA supports FMCSA's efforts to mandate these devices in commercial vehicles as a way to improve safety and compliance in the trucking industry, and to level the playing field with thousands of fleets that have already voluntarily moved to this technology," says Bill Graves, president of the ATA.

But not everybody is as happy with the ruling. The Owner-Operator Independent Drivers Association (OOIDA), for example, argues that the electronic log is pointless because it requires driver input to know if drivers are resting in their off-duty hours.

"The ELD proposal is a 'big brother' mandate that the trucking industry does not need," OOIDA said in press release.

The electronic log debate has been around since the 1990s, and it's not likely that the FMCSA is going to push the deadline again. Truckers should get the ball rolling right away to make sure they have time to vet various providers and technology options.

But carriers can take heart. There's still some time to use those paper logs while saving up their pennies. The new FMCSA rule requires e-log implementation by Dec. 18, 2017. For truckers who already have an e-log device that isn't compliant with the new rules, the deadline extends to 2019.

Reducing Cargo Theft Risk

Statistics show that cargo at rest is at an increased risk for pilferage and full container theft. This is especially true over holidays or extended weekends, which are often marked by increased traffic congestion, crowded truck stops, and a dramatic increase in cargo thefts. Tom Mann, president of TrakLok International, a Knoxville, Tenn.-based cargo security firm, offers a few steps transportation companies can take to decrease cargo theft risk:

Loads at Rest

- Utilize secure lots that provide sufficient barriers to prevent theft or unauthorized access. For example, the compound should have a chainlink fence of 9-gauge material at least 8 feet high and topped with barbed wire, and it should be properly anchored.
- Close truck doors before pulling into the lot so that surveillance efforts cannot see what has been loaded onto trailers.
- Employ the use of security patrols in lots where high-value cargo is staged for transport.
- Use security equipment, such as king pin locks and landing gear locks, to secure trailers while they are being staged. Most important are the use of electronic security locks with active alarm systems installed on cargo doors.

On the Road

- Implement a Red Zone – the distance wherein the driver does not stop after a pickup – of at least 250 miles. Red Zone drivers should be rested, trucks fueled, and all personal needs taken care of prior to a pickup so the Red Zone can be implemented effectively.
- Report any "out of norm" occurrences while loading the trailer or while a shipment is in transit. Drivers should notify dispatch during extended stops at areas such as truck stops and rest areas.
- Remind drivers and warehouse workers to not discuss any details regarding loads – specifically drop locations, routes and contents – with anyone.
- Consider a no-drop policy keeping the trailer married to the tractor so that the tractor and trailer can be secured.
- Use effective access control equipment to maintain integrity while the shipment is in transit. This includes electronically monitored locks that include a tamper detection alarm system and GPS tracking affixed to the trailer doors.

Additional Security

- For high-target shipments, employ multiple layers of security to dissuade or delay cargo thieves.
- Implement regular security briefings to train drivers on surveillance techniques and protocols to follow if they detect suspicious activities.
- Employ a tracking system that includes active and passive alarm systems.
- Utilize a rugged locking system that will notify the driver and security personnel if anyone attempts to breach the trailer door.

FMCSA Fights Driver Coercion

If you are a carrier, shipper, or broker who likes to urge drivers to break safety or Hours-of-Service (HOS) regulations, it's time to rethink the way you do business. A new rule effective Jan. 29, 2016, makes any party caught forcing drivers to break the rules at risk of being fined as much as $16,000 per incident.

Throughout a series of sessions held by the Federal Motor Carrier Safety Administration (FMCSA), many drivers told Congress and FMCSA personnel that they are often urged to stick to deadlines so tight that meeting them would require breaking HOS, commercial driver's license regulations, drug and alcohol testing standards, and hazardous materials regulations.

During a four-year investigation, OSHA determined that 253 complaints from commercial drivers had merit. During that same period, FMCSA validated 20 incidents of drivers being coerced to break the rules by the carriers they worked for, according to a statement published on the FMCSA website.

In addition to establishing the new set of penalties that the FMCSA may enforce on violators, the new rule also lays out new procedures for drivers to report abuse, and establishes new rules of practice for the agency to use when investigating incidents of coercion.

The FMCSA says the new rule will not have significant economic impact on carriers, shippers, or other parties who might coerce drivers, and any economic benefit these companies previously gained from forcing drivers to break the law is now offset by the risk of being fined. The agency also expects an increase in driver health benefits as HOS rules are complied with, as well as an increase in safety since drivers will be better rested.

The new coercion rules fall under the Moving Ahead for Progress in the 21st Century Act, or MAP-21, that took effect in 2014.

How to Be a Supply Chain Management Talent Scout

Albert Einstein was once quoted as saying, "The only thing that interferes with my learning is my education." This pretty much sums up what education has been focused on for the past century. Students were taught to be "book smart" but lacked the business savvy that real-world experience could provide. While times are changing, firms are still struggling to attract, retain, and grow supply chain talent who provide the right mix of applicable knowledge and appropriate skills.

It is clear that universities must produce graduates who are aligned with industry's needs if they are to be a successful source of talent. We know this is important but there are two sides to this coin. One side is the role universities play in preparing supply chain talent. The other side concerns industry's role in identifying critical-to-success skills that universities must provide to ensure students are prepared for the real-world challenges they will face upon graduation, as well as throughout their careers.

Research conducted by the Supply Chain Institute, University of San Diego, was straightforward, interviewing nearly 400 executives in top companies. The survey asked:

1. What essential skills and attributes do you seek when hiring supply chain talent?

2. What skills will be essential to stay competitive five to seven years into the future and beyond?

What did industry executives say?

- Undergraduate curricula should be broad, covering end-to-end supply chain – including global-issues. No "deep dive" into one particular area (more specialization can and should be provided at the graduate-level).
- Talent should be able to grasp the "big picture"—understand how all the pieces fit together and what the impact is elsewhere in the supply chain.
- Talent needs to know how a company makes a profit – not just focusing on cost reduction or specializing in a particular function.
- Internships provide real-world experience…and the more internships the better.
- Supply chain talent should possess essential (building block) skills and attributes (*see chart below*).

It was clear that industry wants talent that is:

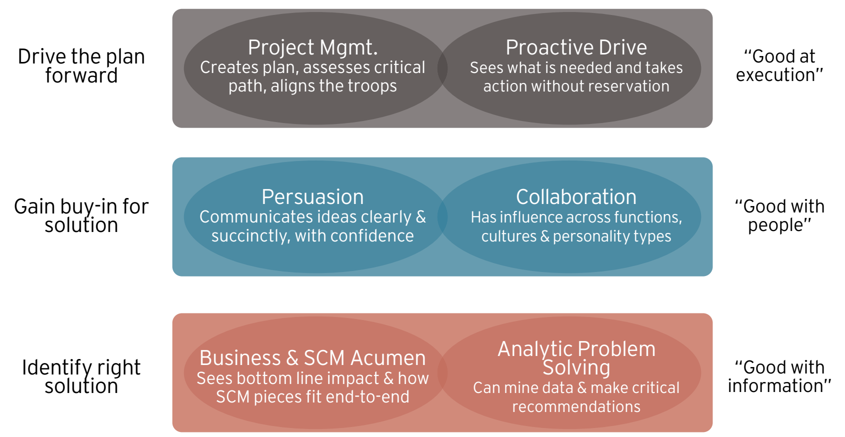
- **Good with information:** Possess analytic problem-solving capabilities and the ability to turn data (especially by leveraging big data opportunities) into useful information. They should have a clear perspective of the end-to-end supply chain and the impact of decisions made upstream on the downstream supply chain. Most importantly, they need to understand how a company makes a profit, and the part effective management of the supply chain plays in making that happen.
- **Good with people:** Possess the ability to work with people across all supply chain functions. They must be effective in developing collaborative relationships with all cultures, genders, and personality types. At the end of the day, they must be able to effectively communicate complex issues, gain buy-in from all stakeholders, and drive the decision making process with confidence.
- **Good at execution:** Possess a proactive attitude that sees what is needed and takes action without being told to do so. Too often, decisions are made and then not executed on. Effective planning and project management skills are essential to drive the plan forward to realize timely and cost-effective results.

While all these skills are important there is one skill that stands out above all the others – knowing how a company makes a profit and how to apply supply chain skills to maximize that profit. While there are still firms that focus on leveraging the supply chain functions to reduce costs, best-in-class firms understand that effective supply chain management can reduce costs AND grow revenue in a way that maximizes profits and return on investment (ROI).

While there are a number of supply chain skills that industry desires, none is more important, or impactful to a company's success, than understanding how a company makes a profit and the important contribution that supply chain management can play. This is a reason an increasing number of supply chain professionals are being promoted to C-level positions – they know how to improve a firm's profitability.

– By Joel Sutherland, Managing Director, Supply Chain Management Institute, University of San Diego

Essential Skills for Supply Chain Leaders



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Consumers Want Delivery Their Way

Remember having to call in sick to work because you ordered three gifts from a catalog and you couldn't afford to miss their delivery before the holidays?

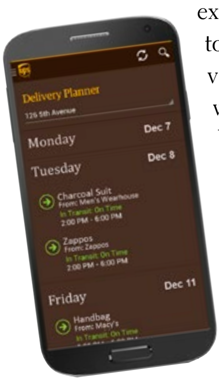
Thankfully, those days are far behind us. We now live in a time when missed package deliveries are almost entirely a thing of the past due to online scheduling platforms and apps.

With another holiday season behind us, consumers have again spoken. They increasingly shop online using devices of their choice at times of their choosing, and they don't just want the things they buy online fast, they want them conveniently.

UPS announced during the 2015 holiday season that its UPS MyChoice platform crossed the 20 million member mark. FedEx offers a similar service with its FedEx Delivery Manager, and even the U.S. Post Office is in the game with scheduled re-delivery online for missed package deliveries.

"Understanding customer needs and creating solutions aimed at improving their delivery experience is an important aspect of gaining market share," according to an Accenture study on the parcel industry. Whether consumers want packages at their door, a drop-off locker, an access point, or a neighbor's house, parcel carriers must be able to meet those demands or risk losing business.

Business-to-consumer shipping is expected to overtake business-to-business in terms of parcel volumes in North America within the next five years. With empowered end consumers becoming the largest customer base for parcel carriers, expect those carriers to continue to do all they can to make the delivery experience as easy as possible.

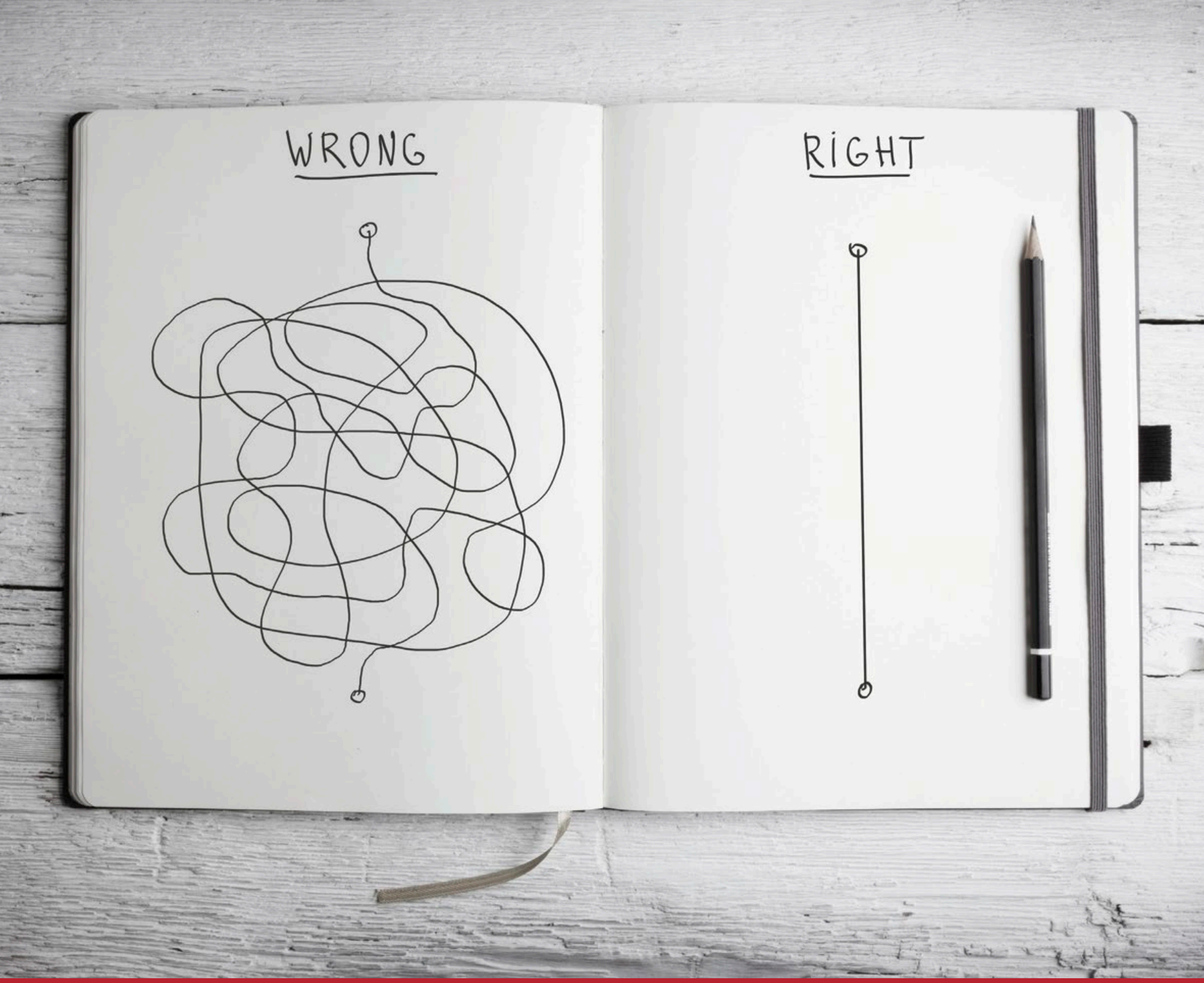


Digitally connected consumers looking for lower prices and greater convenience are forcing parcel delivery companies to rethink traditional delivery methods.

Technologies You'll Need in 2016

In today's complex world, supply chains can no longer function effectively without assistance from technology solutions. But those products are sometimes expensive, and not always specific to every operation. The following list from Jim Hayden, vice president of solutions for Savi Technology, highlights the types of solutions supply chain managers will need to meet the challenges coming in 2016.

- **The Internet of Things (IoT).** IoT-enabled solutions continue to drive transformational change across the supply chain, enabling global organizations to connect products and processes to allow real-time analysis, anywhere, any time. In the past, as much as 80 percent of analytics project costs were related to preparing and integrating data. Today, industrial IoT-enabled solutions help to easily integrate and analyze sensor data, and show a dramatic return on investment. The IoT market is expected to reach more than $1.7 trillion by 2020, according to IDC research.
- **Supply chain visibility.** True supply chain end-to-end visibility will be achieved for the first time in the coming year. Unprecedented availability of sensor-based data and other data sources, combined with advancing abilities to transform big data into usable intelligence, is finally making visibility fully end-to-end. Massive data streams and analytics provide supply chain managers with insights that help them make more informed decisions by simultaneously comparing real-time metrics with past results for more accurate forecasting.
- **Purpose-built applications.** Organizations are demanding purpose-built applications. With the speed at which goods are moving, and the rate at which data comes in now, milestone visibility and toolkit approaches are no longer enough. The purpose-built approach produces critical insights that drive action across the supply chain—as supply chains seek to know what happened, what should happen, and what will happen. In addition, implementing a purpose-built application can be done in weeks instead of months.


WRONG
RIGHT

Apple, Adidas, and H&M have the greenest supply chains among the 167 brands evaluated by the Corporate Information Transparency Index.

by Jason McDowell

It's Not Easy Beijing Green

China reached its highest level of air pollution on record in December 2015. The smog in Beijing was so bad that the government issued a series of red alerts (the highest alert on a four-tier scale) spanning days. The alerts forced more than 2,000 factories to reduce or shut down operations, restricted vehicle traffic, and closed many schools and businesses. The pollution in Beijing registered more than 50 times acceptable levels, according to the World Health Organization, and the situation in Shanghai isn't much better. Some studies suggest that more than 1.4 million deaths in China each year can be traced to air pollution.

With clouds of toxic smog regularly engulfing more than 30 major cities in the country, the timing of a green supply chain list couldn't be better. The Corporate Information Transparency Index (CITI), a project of the National Resources Defense Council and Beijing's Institute of Public & Environmental Affairs, examines the environmental responsibility of 167 major brands' supply chains.

Apple leads the list of China's greenest supply chains, followed by fashion brands Adidas, H&M, Levi's, and Marks & Spencer (*see sidebar, left*). It is no surprise that western multinational corporations with a history of green operations top the list. These companies should be commended for operating sustainably in an area where they could easily not do so.

Because the government isn't known for enforcing environmental standards, many Chinese companies ignore costly environmental measures in favor of increased profits. To reduce pollution and encourage these entities to operate more sustainably, China's Ministry of Environmental Protection and other agencies governing energy, water, and resources must not only implement, but also enforce policies to support environmental protection, according to the CITI report.

The report recommends that corporations interested in maintaining a green supply chain focus their initiatives in areas that would have the most environmental impact, use third-party evaluators to benchmark suppliers' environmental performance, and avoid shutting down environmental programs after the pilot phase.

Considering the health effects of pollution and smog, and the red alerts that disrupt daily lives, Chinese consumers are more tuned in to environmental issues. It is up to the Chinese government and companies operating in the country to promote a sustainable mindset in every way possible, which might drive consumers to push back at companies that hurt the environment.

China's Greenest Supply Chains

Companies are measured on public engagement and responsiveness, compliance and corrective actions, extended green supply chain practices, data disclosure and transparency, and responsible recycling.

1. Apple
2. Adidas
3. H&M
4. Levi's
5. Marks & Spencer
6. Panasonic
7. Walmart
8. Esquel
9. Samsung
10. Microsoft

Source: China's Institute of Public & Environmental Affairs

Supply Chain Disruptions: Shippers Flying Blind

Earthquakes. Port shutdowns. Tsunamis. Factory fires. Terrorist attacks. Equipment malfunctions. Any of these events can unexpectedly disrupt a supply chain at any moment, and most shippers are completely unprepared for it, according to the Business Continuity Institute's *Supply Chain Resilience Report*, supported by Zurich Insurance Group. Seven out of 10 global shippers don't have the supply chain visibility necessary to predict or even respond effectively to a disruption.

Although 74 percent of respondents say they experienced a supply chain disruption in 2014, there are enough unreported incidents that the percentage is most likely higher, the survey notes.

Incidents go unreported due to lack of visibility. Only 28 percent of enterprises surveyed have the capability to report a disruption across their entire supply chain, 37 percent can only report within specific areas of the operation, and 35 percent don't bother reporting supply chain incidents at all. The biggest reason for this lack of capability is an old and persistent problem: Departments operate in their own silos, which limits the ability to report. Until corporate management gets involved and knocks down walls between different areas, the changes necessary to create more visibility likely won't happen.

When companies that are able to track disruptions are asked where they occurred, 50 percent name a Tier 1 supplier, 28 percent name a Tier 2 supplier, and 8 percent name a Tier 3 or other supplier as the cause. A surprising 31 percent say they don't analyze disruptions, so they have no idea of the source of their disruption.

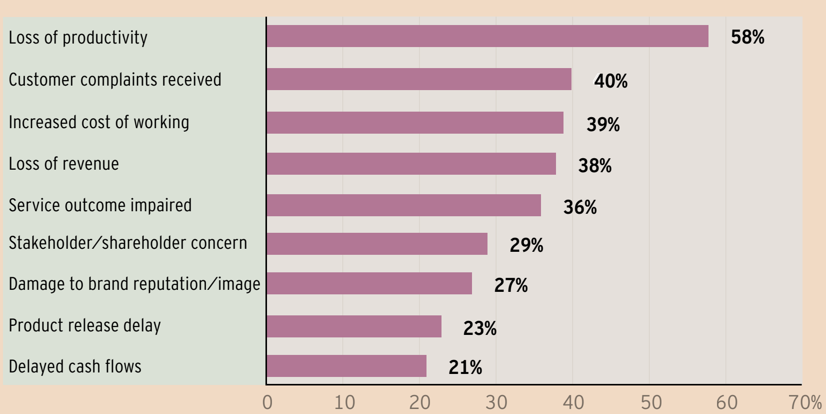
Even if shippers don't know where the disruptions occurred, many are at least able to identify the disruption. The three most common supply chain disruptions are communication failures, cyber attacks, and severe weather. Respondents report the most common consequences of these interruptions are reduced productivity, customer complaints, cost increases, lost revenue, and decreased service.

While the initial results may appear disheartening, the survey does reveal a positive trend. Companies claiming that their C-suite has a strong commitment to supply chain resiliency rose to 33 percent, up from 29 percent in the previous year. An enterprise where top management gives special attention to this area is 43 percent more likely to invest in supply chain end-to-end visibility.

As such, supply chain managers must do all they can to make sure that the C-suite is engaged in efforts to build up a resilient supply chain. Getting the top dogs on board is the best way to make sure your organization is prepared for a disruption when it happens, and has the ability to react appropriately and immediately.

Consequences of Supply Chain Disruption

Survey findings reveal the most common consequences of disruption.



SOURCE: Business Continuity Institute's *Supply Chain Resilience Report*, Zurich Insurance Group

China Wants Pirate Hunting Base in Horn of Africa

China is seeking to establish a new naval logistics center in Djibouti, a country located in the Horn of Africa, as a base for anti-piracy patrols. Because China has never had foreign military bases, the move is causing nervous chatter among other global powers.

Officials say China will use the base as a leave and refueling station for the ships it sends to protect cargo routes off the coast of Somalia. China has deployed 60 such vessels on 21 separate occasions since 2008.

The center would also aid Chinese military support to the United Nations in Sudan, Mali, and other areas.

The logistics center "will play a positive role for the Chinese armed forces to effectively fulfill its international obligations and maintain international and regional peace and stability," says Wu Qian, a Chinese Defense Ministry spokesman. The facilities could also provide logistics support for humanitarian aid missions in the region, he adds.

Djibouti is also the headquarters for the U.S. Joint Task Force-Horn of Africa, and home to a sizeable contingent of French military forces.

U.S., Mexico Shake on Air Transport Deal

The United States and Mexico signed an agreement expected to significantly increase trade and travel between the two countries. The new plan allows airlines on both sides of the border unrestricted access between destinations, and more control over their own prices.

"The new agreement will benefit U.S. and Mexican airlines, travelers, businesses, airports, and localities by allowing increased market access for passenger and cargo airlines to fly between any city in Mexico and any city in the United States," says a joint statement released by U.S. Secretary of State John Kerry and U.S. Secretary of Transportation Anthony Foxx. "Cargo carriers will now have expanded opportunities to provide service to new destinations that were not available under the current, more restrictive agreement."

The new deal has particular implications for the supply chain. The agreement is expected to benefit the manufacturing sectors of both nations by more easily allowing manufacturers to connect with suppliers, which should drive economic growth for partners on both sides of the border. The new rules are expected to take effect once the deal passes Mexico's internal ratification procedures.

International Shrimp, Jumbo Supply Chain Problems

Most companies know their Tier 1 suppliers pretty well. But how well do they know those suppliers' suppliers? As the global shrimp supply chain is finding out, a lack of end-to-end visibility can be incredibly harmful to an enterprise's reputation.

Consider Thailand's Charoen Pokphand (CP) Foods, a company that supplies shrimp products to many of the world's largest grocery retailers, including Walmart, Carrefour, Costco, Tesco, Aldi, and Morrisons.

The supply chain works like this: Off the coast of Thailand, third-party fishing boats catch thousands of fish that nobody wants to eat. The boats sell those fish to factories, where they are ground down into fishmeal, and then sold to companies like CP Foods, which uses the fishmeal to feed the shrimp in its shrimp farms, and proceeds to sell those shrimp all around the world. This seems like a pretty straightforward supply chain, right?

The problem is, human rights violations are a regular practice for major suppliers of the fish used to create the fishmeal, reveals a six-month-long investigation by international news outlet *The Guardian*.

"On Thai fishing boats, some men remain at sea for several years, are paid very little or irregularly, work as much as 18 to 20 hours per day seven days a week, or are threatened and physically beaten," says the U.S. State Department's *2015 Trafficking in Persons Report*, which rates 188 nations on how well they combat and prevent human trafficking. "Some victims of trafficking in the fishing sector were unable to return home due to isolated workplaces, unpaid wages, and the lack of legitimate identity documents or safe means to travel back to their home country."

The report lists Thailand as a Tier 3 country for human trafficking, second from the bottom in the four-tier rating system. By comparison, North Korea and Iran are also Tier 3 countries.

"Thailand is committed to combating human trafficking," said Vijavat Isarabhakdi, Thailand's ambassador to the United States, in a statement to the press. "We know a lot more needs to be done but we also have made very significant progress to address the problem."

Thailand's shrimping industry exports more than 550,000 tons of shrimp each year—10 percent of which is exported by CP Foods, according to *The Guardian*. The Thai government estimates that 300,000 laborers work on the fishing boats; 90 percent are migrants susceptible to being fooled, cheated, and eventually trafficked.

"We're not here to defend what is going on," said Bob Miller, CP Foods' UK managing director, during an interview with *The Guardian*. "We know there are issues with regard to the material that comes in, but to what extent that is, we just don't have visibility."

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Air Carriers Need Tech Tools To Navigate the Friendly Skies

With an economic recovery in progress, many carriers and transportation industry stakeholders are benefitting from consumer confidence spikes across the globe, and the increased spending that has more goods moving from place to place. Ground carriers can always count on long haul and last-mile business, while new super-sized container vessels ensure affordable capacity over the water. But for the air cargo industry, cashing in isn't always as simple.

Even though capacity continues to expand, air cargo carriers in many regions suffer from slow growth or even contraction, according to numbers released by the International Air Transport Association. This has led air cargo executives to search for more ways to cut costs without sacrificing growth.

Operational efficiency and capacity utilization are among the top challenges that air cargo carriers are trying to address, according to Accenture's *2015 Air Cargo Survey*, and they need the tools that can help them improve in these areas.

The challenges are especially tough for mid-size and large carriers that have a lot of capacity to fill. Among the air carrier respondents to the survey, 71 percent say they would consider purchasing a Software-as-a-Service (SaaS) solution to help address efficiency and capacity concerns.

"For many air cargo carriers, limited visibility into capacity utilization can result in serious revenue leakage through a number of causes," says Ganesh Vaideeswaran, managing director, Accenture Freight and Logistics Software. "These include unnecessarily shipping low-yielding freight on in-demand routes to underutilized allocations, and being unable to respond to shipment disruption."

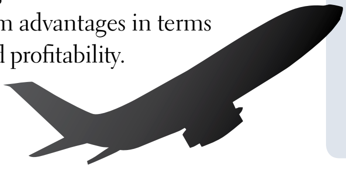
Most air cargo executives responding to the survey agree that they need to work on three areas:

1. Capacity. Having unused capacity causes carriers to hemorrhage money because they are paying to store or maintain unused equipment. Nearly 70 percent of carriers struggling to cut costs are looking for ways to optimize capacity through automation and software solutions.

2. Pricing. Only 14 percent of Accenture's survey respondents say they are capable of maintaining steady and competitive rates; many carriers don't have the technology tools to guarantee consistent pricing. Other problems, such as shippers who provide incomplete shipment data, and lack of control over sales operations, also affect pricing.

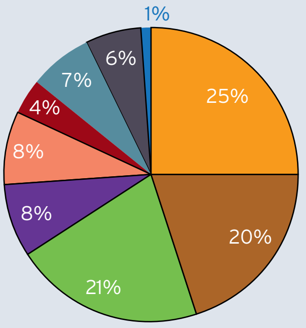
3. Visibility. Only 54 percent of air cargo executive respondents say they have full end-to-end visibility through every stage of the shipment.

Bottom line: air cargo carriers need technology solutions that can manage these areas, and others, to streamline processes and plug up areas where revenue is leaking. Considering that air cargo transports 35 percent, or $6.8 trillion of the world's goods each year, spending some money now to plug those holes will net definite long-term advantages in terms of growth and profitability.



Top Operational Problems Facing Air Cargo Carriers Today

More than half the cargo executives surveyed say operational efficiency and capacity utilization are among the top operational problems that they are now trying to address, with capacity utilization representing a particular challenge for medium/large carriers.



Source: Accenture 2015 Air Cargo Survey

Shifting Production in South Asia

Companies continue to reshore and near-shore manufacturing to the United States, but that doesn't mean manufacturing in Asian countries is in decline—though there are signs of a geographic shift. In response to rising wages in China, some global manufacturers have begun to shift production to nearby countries, including Bangladesh, Thailand, Korea, and Vietnam.

"A number of manufacturing companies are moving into and out of China; some of the more labor-intensive, lower-skill manufacturers are moving to Thailand and Vietnam," says Morris Cohen, professor of the manufacturing and logistics, operations, and information and decisions management department at the University of Pennsylvania's Wharton School. "However, higher-skilled aerospace and automotive manufacturers are moving to China. Both moves are decided, in large part, because of labor costs and market access."

Cohen's *Global Supply Chain Benchmark Study: An Analysis of Sourcing and Re-structuring Decisions* finds that while China is still the most attractive region for sourcing production, it is also among the top countries experiencing volume decreases.

"Companies leaving China do so for total cost reasons," he adds. "Nearby countries emerge as low-cost destinations to serve Asian markets for high-labor, low-skill manufacturing plants. With the move, manufacturers maintain the advantage of market access and low-cost labor. The market of the future is Asia, India, and China, where the middle class will buy cars, televisions, and computers as well as medical services."

Some examples of this growth include Samsung Electronics Co., which opened a $2-billion manufacturing plant for handsets in Vietnam, and Paramit Corporation's construction of a new facility in Penang, Malaysia, to build medical devices and life sciences instruments.

–Vicki Speed

Smoother Sailing For Cargo Entering Kenya

A new pilot program clears much of the red tape for companies bringing cargo in through the Port of Mombasa in Kenya. The port can now clear incoming cargo seven days in advance.

"The program will support the political commitment in the region to integration, where we have so far achieved a reduction in transit time and reduced cost of transport and importing through Mombasa," says John Njiraini, commissioner general of the Kenya Revenue Authority (KRA).

The new program was created to increase efficiency at the port, and to support integration of the East Africa Community initiative, which aims to reduce cost and transit times for freight, and promote trade in the region.

"When you log the documents in advance, you have the time to process them, profile them, and be ready when the vessel comes," says Julius Musyoki, the KRA's commissioner of customs. "You just load your cargo and move out."

Manufacturers should benefit the most from the program because they can clear their raw materials in advance, and haul them off immediately once they arrive at the port. Even if cargo isn't picked up right away, the program awards domestic cargo four free storage days, and transit cargo nine free days.

The port also began reviewing bids for a new cargo scanner system, which should further improve processing times. And once cargo leaves the port area, KRA has implemented a tracking system between Kenya, Rwanda, and Uganda to curb cargo theft. It has also cleared checkpoints and roadblocks to reduce highway transit times to those destinations. [ ]

WTO to Abolish Agricultural Subsidies

Many governments around the world provide subsidies to exporters of agricultural products, but the World Trade Organization (WTO) recently ruled that those subsidies make it hard for poor farmers in developing nations to compete on a global scale. The new rule aims to even the playing field.

An export subsidy constitutes any loan, direct payment, or tax relief for farmers exporting their crops into the global market. The WTO tackled the issue once before in 2005, when it vowed to end all agricultural export subsidies by 2013. But it failed to follow through.

"WTO members – especially developing countries – have consistently demanded action on this issue due to the enormous distorting potential of these subsidies for domestic production and trade," says Roberto Azevedo, director general of the WTO, in a statement to the press. "This decision tackles the issue once and for all."

Developed countries must cease providing subsidies immediately, while developing countries have until 2018 to halt subsidies. Farmers in areas such as New Zealand, where agricultural subsidies make up about 1 percent of revenue, are cheering the decision. Meanwhile, agricultural exporters in Switzerland, where subsidies represent 58 percent of revenue, are likely less enthusiastic.

Doug Waggoner, Chairman and CEO, Echo Global Logistics
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Advantages of Partial Truckload Shipping

Less-than-truckload (LTL) and full truckload transportation are regularly discussed, but an often overlooked mode is partial truckload, or volume LTL. This mode has benefits shippers should consider when looking for faster transit times, less handling, and a more cost-effective solution.

Logistics professionals begin to look at partial truckload or volume LTL as an option when their clients have shipments that fall between LTL and full truckload. Definitions of partial vary, but they are generally based on the size of the order (weight and linear feet) and service requirements (time sensitivity and the type of freight).

LTL networks are optimized for shipments generally less than 12 linear feet and one to six pallets. Full truckloads tend to contain 26 to 30 pallets and approximately 42,500 pounds. The partial "sweet spot" is between six and 18 pallets and/or between 8,000 and 27,500 pounds. Shipping partial truckload allows third-party logistics providers (3PLs) to utilize their carrier networks to haul these shipments with carriers that have extra room on their trailers. Why pay for a full truckload if you don't have to?

The Value of Partial Truckload Shipping

Unlike LTL, partial truckload shipments usually do not require freight class, eliminating re-classing and the extra charges (such as minimum density) that typically accompany larger shipments.

Partial truckload carriers usually do not stop at distribution terminals along the way to their destination, which generally leads to a higher percentage of on-time deliveries, faster transit times, and less handling of freight. Additionally, partial truckload carriers typically offer cargo insurance coverage comparable to truckload carriers, which is often greater than what LTL carriers offer.

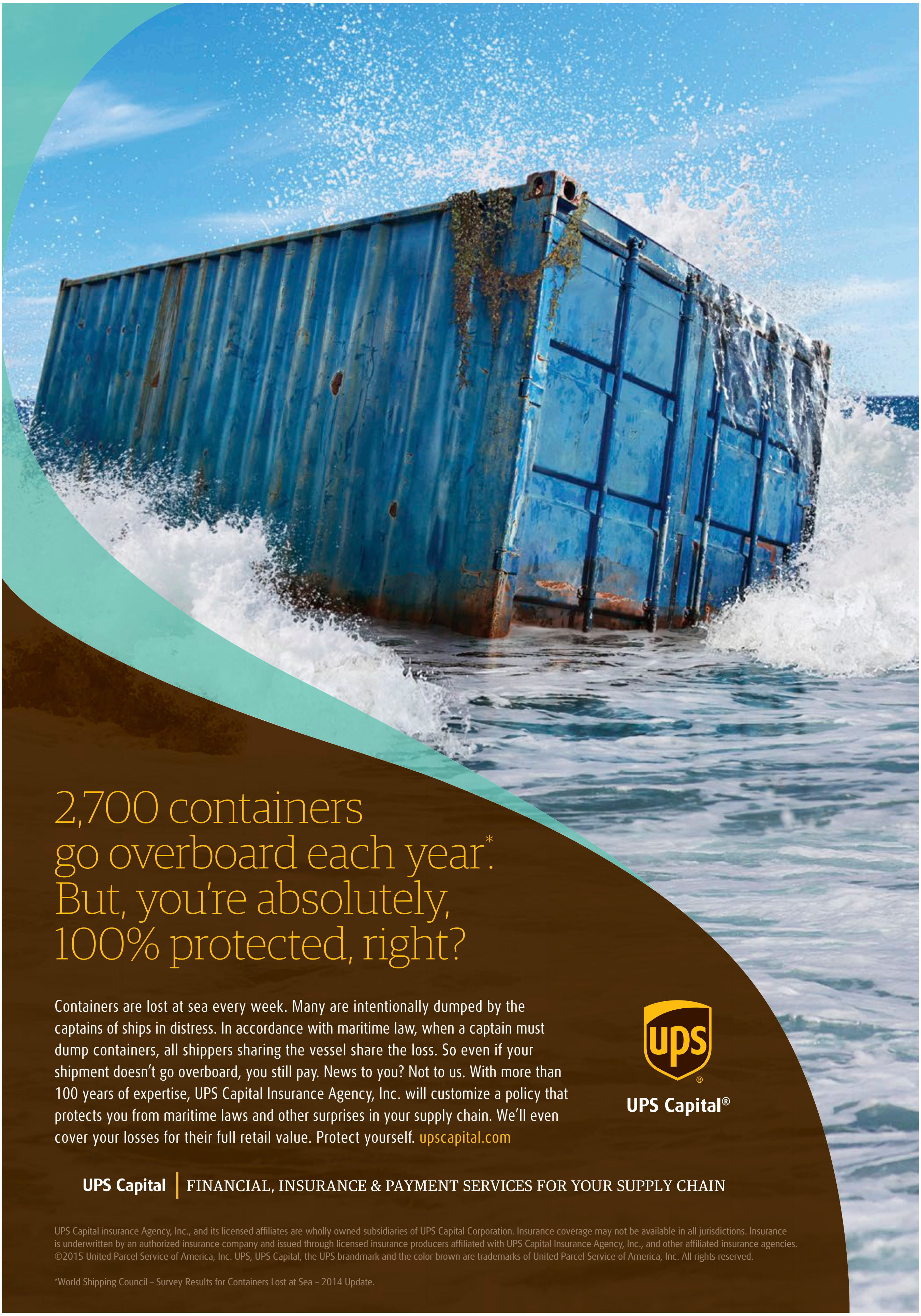
At Echo we simplify transportation management by using partial truckload carriers to make time-sensitive deliveries for our clients as well as specialized services such as "no touch" delivery and white glove/final mile. Our experience in the truckload industry and our deep relationships with carriers ensure our clients know when shipping partial truckload benefits them and why. In 2014 Echo shipped more than 90,000 partial loads through thousands of partial truckload carriers.

Racking Up Savings

There is a substantial savings opportunity for shipments that meet the criteria of partial truckload. For example, a 10,000-pound LTL shipment (seven pallets, class 70) moving from Chicago to Los Angeles can cost between $2,000 and $4,000 on a top-tier LTL carrier (but may be subject to linear foot provisions, leading to additional charges) and between $2,700 and $3,200 as a full truckload (depending on service requirements and capacity). However, that same shipment as a partial truckload costs between $900 and $1,050.

Although not all 3PLs specialize in partial truckloads, look for one that has not only the relationships with the best partial truckload carriers but also the technology to support your transportation needs.

Echo Global Logistics is a provider of technology-enabled transportation and supply chain management services. Echo maintains a proprietary web-based technology platform that compiles and analyzes data from its network of transportation providers to serve its clients' transportation and supply chain management needs. Echo offers freight brokerage and Managed Transportation solutions for all major modes, including truckload, partial truckload, LTL, intermodal, and expedited. For more information, go to www.echo.com.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*World Shipping Council – Survey Results for Containers Lost at Sea – 2014 Update.

LOGISTICS knowledgebase

Ken Wacker, Executive Vice President, Enterprise Business Solutions, Transportation Insight
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Accelerating Enterprise Logistics With Top-Tier Multi-Modal Solutions

Logistics has evolved into a strategic business concern—from a back office function to a boardroom agenda item—and as a result, enterprises now seek 3PLs with multi-modal capabilities for complete end-to-end integration. By linking all transportation modes, enterprise shippers leverage the entirety of the supply chain to achieve economical logistics performance.

Today, it is important for organizations to align and collaborate with 3PLs that have deep domain expertise. For businesses that think change management is an integral part of their shipping operations, this trend is increasing.

If an organization isn't changing, it's going backward. Enterprise executives know they have to transform their businesses to compete for market share. In addition to being cost conscious, they also think about minimizing operational inefficiencies, administrative burden and risk within the functional areas of their operations.

One area where organizations can leverage 3PLs to mitigate the impact of risk is through assessments: conducting routine "health checks" to make sure that shipping operations are tracking to KPIs and other metrics ensuring that performance is routinely meeting or exceeding expectations. 3PLs that offer true Enterprise Logistics solutions have the tools and expertise to conduct such assessments and design the remediation.

Accommodating E-Commerce

E-commerce has changed the enterprise supply chain. Both business-to-consumer (B2C) and business-to-business (B2B) e-commerce operations are driving the preponderance of change in small package and parcel delivery. Even the impact of technology that enables smaller organizations to spin up web-based commerce sites has been dramatic, which is fueling demand.

From a supply chain executive's perspective, e-commerce drives the need for a shipping platform that is flexible and meets changing demands. Both B2C and B2B customers use mobile and traditional technology to become increasingly savvy in procurement. In turn, they demand more from logistics operations.

There are, however, cost and operational implications in meeting these demands. How do you put products in the right place and get them to the consumer on time? The cost-to-serve increases when delivering on a daily or hourly basis versus a two, three or four-day delivery. The enterprise shipper needs to determine if the ROI makes sense for their business.

A Better Way to Ship Now

Best-in-class enterprise shipping operations must understand how their delivery profile impacts every carrier's network. Consequently, shippers can "tune" their shipping profile to optimize and align it with their carriers' networks. Why is this important?

These scaled carrier networks won't change for the shipper; thus, the shipper has to align to the networks. Once they do that, the networks become more efficient for them, and they can leverage the networks more economically. The alignment also improves the carrier's ability to serve.

Partnering with a multi-modal Enterprise Logistics solutions provider offers today's enterprises insight into better ways to ship. In addition to ocean, rail, air, truckload and less-than-truckload freight optimization, the time is now for enterprises to reach out for third-party expertise in small package or parcel logistics optimization, parcel auditing and advanced parcel shipping analytics.

In the supply chain, much of the 3PL's value is in the assessment and design phase, where analytics not only provide visibility for the shipper, but also drive ongoing operational improvement of the shipping platform. While satisfying the demands of increased volume and other customer expectations, a more economical way of shipping is subsequently achieved.

Better Enterprise Logistics practices drive sustainable corporate growth. If organizations don't understand this, they'll be left behind.

Transportation Insight delivers Enterprise Logistics solutions in all modes of transportation to more than 1,000 North American clients. Ken Wacker is Transportation Insight's Executive Vice President of Enterprise Business Solutions. Wacker is a leader in his field for driving corporate growth through outsourced business services and supply chain optimization.

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Education, Outreach Keys to Changing the Face of Supply Chain

The supply chain has an image problem. Although modern operations no longer resemble the dark, dirty, stagnant facilities of the past, we're still challenged by that popular perception. In reality, supply chains are global enterprises led by a diverse group of professionals who routinely utilize innovation, creativity and smart thinking to drive operational efficiency as they keep the economy going.

Further, even though more than 11 million people work in the field—8.6% of the nation's workforce—a shortage of skilled workers persists. As baby boomers retire at an amplified pace, our industry must figure out how to attract, train and retain an ample workforce. That's because, in just two years, 1.4 million new jobs will be created throughout supply chains.

To fill those openings, our industry must find ways to attract demographics that, historically, haven't comprised a significant part of our workforce, including women and people under the age of 35 (commonly called 'millennials').

But how?

At MHI, we believe the key to promoting career opportunities in the supply chain is education, both in traditional and not-so-traditional ways.

On the traditional path—education in the classroom—MHI's Career and Technical Education (CTE) program has developed a comprehensive curriculum that includes a four-volume textbook set, Fundamentals of Warehousing and Distribution. Already in use at more than 60 institutions around the country (including high schools, community colleges, technical schools and department of corrections programs), the materials help their instructors prepare students for entry-level positions in supply chains—in warehouses, transportation, operations, scheduling and manufacturing support.

Additionally, we welcome those instructors and students to attend our ProMat and MODEX trade shows through a special "Student Days" program. During those two days, students visit exhibits on the show floor to check out the latest equipment and technologies provided by MHI members, then see them deployed as they tour a local warehouse facility.

MHI also has an equipment donation program that matches the equipment and technology needs of CTE programs with MHI members and MODEX and ProMat exhibitors willing to donate. This program assists high schools, technical schools, community colleges, universities and similar training organizations in obtaining material handling equipment and systems for their working labs and training facilities. Donated equipment supports hands-on training and education for students in warehousing, logistics, engineering and supply chain management.

Further, through our ongoing partnership with the College Industry Council on Material Handling Education (CICMHE), we've been working to support undergraduate and graduate instruction and research programs at a variety of colleges and universities across the nation. And academia is responding.

Throughout higher-education institutions, there's been an explosion of growth in supply chain degree programs. According to research by Gartner, curricula have been greatly expanded to give students more of an end-to-end view of the supply chain, complemented by coverage of technology fundamentals and deep dives into analytics and modeling. Sharing the stories of those who have built careers in supply chain is also part of MHI's education strategy (the not-so-traditional part) in order to generate more mainstream awareness of the supply chain—not only of its importance but also of its actual existence.

Amy Carovillano, Vice President of Logistics and Distribution at The Container Store, explains: "People don't think about how products get to the shelf. When I talk to young women—and young men—about supply chain, logistics, transportation and warehousing, they don't understand. It's just not a visible career because by definition we're the back end of every business."

To that end, MHI has launched an awareness campaign to not only promote manufacturing and supply chain as an innovative and rewarding career choice but also to change the perception of jobs in the industry. The goal of the #iWorkInTheSupplyChain campaign is to connect, engage and inspire next-generation workers to pursue supply chain careers.

We invite you to submit your own supply chain career stories to www.iWorkInTheSupplyChain.com, and help correct the popular misconceptions about working in our field. We hope you'll accept our invitation to turn our industry's image into one of opportunity.


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It's All About Risk: The Case for the Cloud

Use cloud software, buy enterprise software, or write your own–which is the best choice for your company?

Companies in the transportation business traditionally bought enterprise software or built their own. That has changed. Over the last 10 years, cloud software has become a popular alternative, and for good reason. It's the choice that exposes your company to the least risk.

Of course some transportation people have built their own systems with great success. Jeff Silver of Coyote Logistics is one example. But to say Jeff is exceptionally experienced, knowledgeable, and talented is a considerable understatement. There are very few Jeff Silvers out there.

Most people who try to do it themselves seriously underestimate the challenge. Even in the best-case scenario, software will take at least a few years to develop and will more than likely run many times over the original budget. Yes, in the end the software may be good, and it might even be great. On the other hand it may be no better than off-the-shelf software. Worse, it could be a total disaster.

If you do build your own software, even if it is great and "only" takes two years to build, you're already two years behind. It's the catch-up factor. During those two years, software companies added changes and features – sometimes features that customers quickly learn to expect. To meet customer expectations in the broad marketplace, you have to keep up with those changes and upgrades.

Established software companies are in the business. Their development budget is supported by hundreds of transportation customers. You, on the other hand, have only yourself as a "customer," and you're not even in the software business. You're at a serious disadvantage. None of your software development costs will be shared. You pay 100% of everything.

Unless your business is extremely specialized, writing your own software is probably not a risk worth taking.

Enterprise software – software you buy or "invest" in – is the next riskiest path. First, you spend hundreds of thousands of dollars to buy software, servers, equipment, and licenses. Only then do you learn if the software works as well as you have been led to believe.

It's curious that enterprise software is sometimes described as an investment. Investments should pay dividends. But when you purchase software, it's the opposite. That "investment" will require expensive upgrades, support, and maintenance for its entire useful life. And for all the money you'll spend upfront, no one can say how long that useful life will actually be.

By far the least risky option is cloud software. It's faster, better, and cheaper.

First and foremost, you have no big up-front expenses. That takes a whole lot of risk out of the equation.

When you build your own software, you commit your company to spending money for years before you get any benefit. When you buy software, you financially commit to something that when it's finally rolled out, may or may not meet your need. Cloud software is different. You will know quickly if it's going to work for your company or not.

If it does not work, or if for any reason you don't like it, you can leave. It's never convenient to change business software, but when that software is hosted in the cloud you can change quickly and without losing tens of thousands of dollars at the very least.

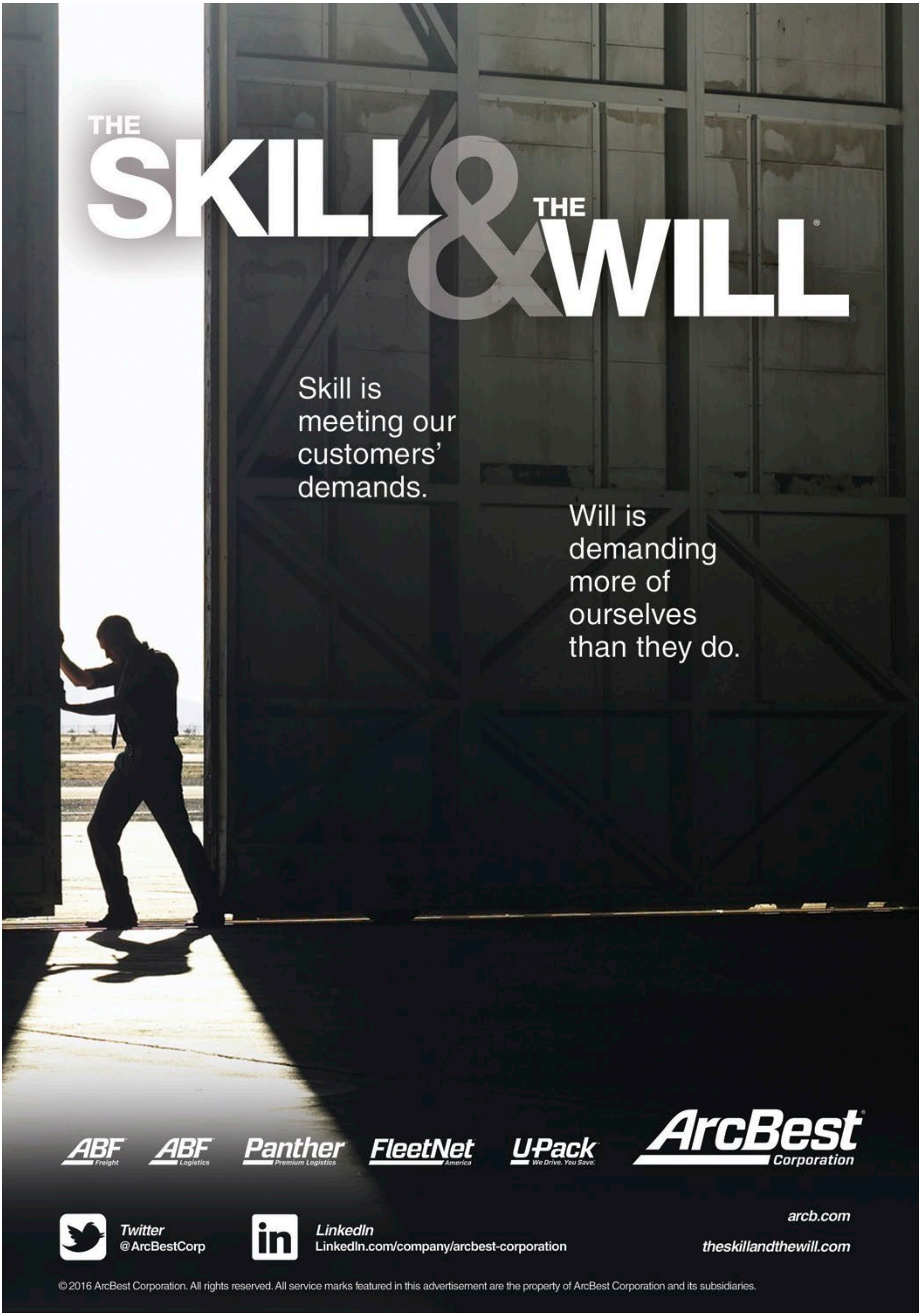
One more thing, when deciding among home-grown, enterprise, or cloud-hosted software, companies often overlook security and backups.

Are you an expert on computers and hackers? With an enterprise system or homegrown system, you better be. Your system will be on the Internet and there's a war going on out there. You will have hackers trying to get in your system every day, 365 days a year. One day you're doing fine, the next you can have foreign hackers sending millions of spam emails from your system. With an owned system you need to be extremely vigilant about protecting your data. Cloud systems, on the other hand, have full-time administrators focused on security all the time.

With homegrown or purchased software, you may have to pay for a full-time tech person focused on keeping hackers out. Cloud systems enable you to spend that same money on an extra dispatcher whose focus is to make you more money.

When you add up all the pluses and minuses of the different systems, cloud software is the least risky choice. Beyond that, cloud software is faster to get started with, includes more frequent upgrades, and costs less overall.

Faster, better, and cheaper: Important words for companies working on tight margins.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A Five-Step Blueprint for 3PL Success

Companies are always on the lookout for ways to enhance their supply chain operations and make them more efficient. But 3PLs, in particular, face the unique challenge of regularly improving how they work with shippers, and, in the face of regular rate increases, finding new ways to reduce freight costs to keep prices down for customers. With margins already razor thin, it's more crucial than ever that 3PLs turn to information technology to help conquer these challenges and relieve the pressures related to costs, time and quality of service.

In order to save money, better collaborate with shippers and gain a competitive edge, 3PLs should consider these five technology-driven actions to boost performance and customer satisfaction.

1. Automate Processes and Data Transfers. Despite advances in technology, many freight forwarders continue to rely on costly manpower to re-key information for each shipment. By using an automated system connected to trading partners, carriers, agents and brokers, information can be entered once and then automatically updated and passed on to the next party – saving time and avoiding errors. What's more, critical shipment documentation such as air waybills, bills of lading and manifests can be accurately system-generated and saved electronically for greater visibility. Major efficiency gains and cost savings can be made by automating data transfers between systems, whether it's for order management, the creation of export documentation or filing of customs declarations.

2. Reduce Operations Time with Shippers. When it comes to responding to customers' rapidly-changing requirements, speed is of the essence. The ability to quickly set up new customers or alter arrangements for existing clients can be the difference between winning and losing a contract. It's critical to consider how a freight forwarding software package can enable 3PLs to operate faster, more efficiently and with greater flexibility. In doing so, 3PLs need to examine how a cloud-based platform can easily configure their processes to meet business needs without the need for expert IT resources or an expensive hardware investment. This added agility can also open up additional revenue streams.

3. Make Trade Compliance a Priority. While many shippers place an emphasis on compliance, many of them do not have the right resources or time to focus on ever-changing compliance requirements. This presents an opportunity for 3PLs to offer customs compliance as a service for customers and create a new revenue stream for their business. For example, 3PLs can ensure shipments are screened against the denied party list, checking for embargoed countries or acquiring and tracking all appropriate export licenses. Providing trade compliance services for the shipper enhances revenues and profits not only for the shipper, but for 3PLs as well.

4. Increase Shipment Visibility. Now more than ever, shippers are demanding better visibility from 3PLs. Reliable shipment visibility is essential to keep goods on schedule, costs in check, customers satisfied and margins protected. While this may sound like a daunting task, 3PLs should look for a hosted freight forwarding software system that provides end-to-end shipment visibility. This kind of solution can actually save 3PLs money by reducing errors and ultimately provides a competitive advantage against 3PLs that can't deliver when it comes to visibility.

5. Incorporate Automated Alerts. Alerts are a key defense against supply chain factors that are outside of a 3PL's control. As goods move through the supply chain, customers need to know things are on track and that critical milestones are being reached. Automated alerts notify them when service level agreements or major milestones are at risk. Alerts also allow 3PLs and their customers to manage shipments by exception. Exception-based management filters out a lot of the noise common to the delivery lifecycle and allows shippers, customers and suppliers to focus their attention on shipments that are experiencing legitimate issues that need to be addressed, thus driving greater efficiencies. Freight forwarding software vendors now offer a wide variety of options for alerts – from simple notifications that an event has or has not occurred to sophisticated options that trigger follow-up activities.

It is critical that 3PLs take a hard look at operations to determine areas for cost reduction, productivity and efficiency improvements, and opportunities for new service offerings and revenue streams. There is also a great opportunity for 3PLs to save money, better collaborate with shippers and, ultimately, gain a competitive edge with the right IT mix. In a business as dynamic and complex as freight forwarding, technology is crucial to maintaining efficient, flexible operations.

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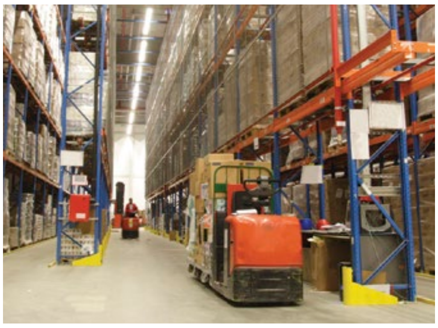

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Multinational Diversity Drives Measurable Success in Logistics Operations

The logistics industry is international by its very nature. Logistics providers – particularly freight forwarders – manage relationships with companies around the world as shipments are moved globally. As a result, the United States is more diverse than ever before, which presents an opportunity for companies to partner with a logistics provider that hires staff from many countries and backgrounds as part of its business model and the core values of its operations.

True diversity in employee nationalities is built into a company's DNA, with the goal of gaining strength as an organization through the recruitment of outstanding people with a variety of backgrounds, languages, skills, ideas, and cultures. Seeking an internationally-diverse logistics partner enhances growth worldwide and promotes superior results for clients, both global and domestic.

In fact, multiculturalism can be the competitive advantage that makes the critical difference in the success of your supply chain operations. Businesses that partner with a multicultural logistics provider build stronger relationships with their supplier base through shared languages and cultures, gain access to a variety of new business opportunities, and create a more agile supply chain through creative solutions.

Below are five good reasons to make multinational diversity a focus when choosing a logistics partner:

1. Multinational diversity supports better customer service. When employees are able to communicate with international clients in their own language, with an understanding of their culture, they are better equipped to offer high levels of customer service and satisfaction.

2. Multinational diversity increases efficiency through the ability to innovate. When team members are able to contribute multiple points of view, solutions to business problems become more dynamic and creative.

3. Multinational diversity helps achieve sustainability through being adaptive to many environments and situations. When different perspectives are taken into account during process development, the result is a more nimble strategy that can evolve as client needs arise and the business climate changes.

4. Multinational diversity promotes quality through an understanding of cultures and the unique needs of individuals. While world business is becoming truly global, huge regional variations still exist and will continue to do so. Companies can build better processes, products, and services by taking into account cultural variables.

5. Multinational diversity helps attract more diverse top-tier talent from around the world, building a stronger organization. By focusing on recruiting and promoting individuals with a wide array of backgrounds, companies can achieve higher levels of employee engagement and attract more talent.

Recently, global management consulting firm McKinsey & Company released the results of a study called Diversity Matters. The study found that firms in the top 25 percent for racial and ethnic diversity were 35 percent more likely to have above-industry-median financial returns.

Recognizing that diversity is an important attribute for your supply chain partner is the first step. Determining how to select a logistics provider that has a deep multinational culture is the next. Here are the important qualities to look for in your partnership:

1. Its key leaders support multicultural diversity in their actions. A truly diverse logistics partner will have a leadership team that acts and interacts with employees, associates, and business partners in ways that demonstrate respect and flexibility to diverse perspectives.

2. Its corporate philosophy promotes an all-inclusive environment. A multinational logistics partner will have core values that encourage openness and ensure that multiple points of view make up the creative process.

3. Its diversity goes beyond HR. A diverse logistics partner implements initiatives at the corporate and departmental levels that foster open channels of communication, drive innovation through the diversity of thought, and remove barriers for an all-inclusive culture.

The business landscape in the United States demands that multinational diversity be a top priority. Organizations with staff composed of many national origins and speaking a multitude of languages have a huge competitive advantage. The time to invest in diversity as a strategic business model is now, starting with a multicultural logistics partner. To stay competitive in today's market, embrace the benefits of diversity in your own organization and in your strategic partnerships.

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Using Data Analysis to Minimize Transportation Costs

In today's data-rich world, the logistics industry as a whole is surprisingly behind the times. It's been said that there are two ways to increase profits: raise prices or reduce expenses. Moving product around spends money. Whether a shipper is taking inbound deliveries of raw materials or sending a finished product to an end user, those shipments cost money, and a lot of it.

Business logistics is a massive industry: $1.45 trillion in 2014, totaling 8.3% of gross domestic product (GDP). Minimizing those transportation costs through data analysis can have a huge impact on a company's bottom line.

Using the powerful reporting tools within CarrierRate 2.0, a shipper can see exactly what they are paying per pound for their freight shipments.

Have a supplier that costs your company as much as double per pound for the same product? It may be time to look for a new source. Even if a supplier appears to have a lower price than others on what you need, it probably isn't worth it to ship across the country. You may consider opting for a more expensive, but local, supplier, and save on total cost by paying much less for shipping.

Even if a supplier usually routes a shipment, and claims shipping is free, they may have built that cost into their price. Inform your supplier that you can route your own freight and inquire as to what the price would be that doesn't include shipping. The result may surprise you: a lot of companies build extra profit for themselves by marking up shipping.

Another factor to consider when it comes to inbound shipping is placing volume orders. Generally, the cost per pound of a full or partial truckload is a fraction of doing the same shipment in multiple LTL orders. Taking advantage of even lower intermodal rates can see greater savings, if you can afford the longer transit times. Shipping via full truckload or intermodal is definitely worth consideration if your company has the space to store an entire bulk order.

Consider the actual cost of freight to your company.

Do you usually include freight charges in your own pricing to your customers? Another stat to consider is your outbound cost per pound. If freight charges are going to result in little to no profit (or even a loss), then it would be prudent to put some of that financial burden on your customer. Using analytics, you can know ahead of time which states or cities are going to cost you the most, and mark up your freight charges accordingly.

Track your freight spend month over month to discover trends in the way your company spends on logistics.

If a company is growing, they generally will have an increase in both inbound and outbound shipments. Tracking your monthly spend is essential to keep a finger on the pulse of your business. There's been a recent increase in firms that will analyze a company's supply chain and logistics spend for a fee. If working with a broker or 3PL, demand that the TMS you use has built-in analytics and reporting features. This way, you can keep track of your transportation costs without incurring additional fees for paying someone else to track those costs for you.

GlobalTranz has developed a suite of tools within CarrierRate 2.0 to help shippers leverage their own data to their advantage. Cost savings, therefore higher profits, are within reach!


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Spring Clean Your Trade and Compliance Processes

This is the time of year when many of us begin our spring-cleaning projects around the home. Yet it is a good idea to also consider some spring cleaning of your organization's trade compliance processes, perhaps dusting off some plans set earlier and readying programs for developments coming in the remainder of the year.

Prep for trade partnerships: While the Trans-Pacific Partnership is now in the protracted political process of ratification among member nations, it is too early to know regulation outcomes and to make operational decisions based on it. However, it is a good idea to proactively ensure tools are ready for whatever comes from it. If you count on your global trade management system for critical landed cost information — or maybe you are considering purchasing such software — is it able to handle quick changes to tariff rules as they become known? If you anticipate this might promote significant changes in your shipping patterns, give a "heads up" to your logistics and trade partners. You also need to alert service partners so their networks can be ready for you, too.

Scrub your screens: Companies must ensure goods are not sourced from, sold to, or do not come into contact with parties on the many national and government agency restricted party screening lists — not only those of many US bureaus but also of other national and international lists, including those from the United Nations, Japan, the UK, the EU, Japan and others. The frequency of change of these lists continues to increase, especially given the recent volatility of some regions of the world. Check that you are accessing the latest lists, and if you are multinational that you are employing the lists associated with all your shipping lanes. Choice recently implemented a new global trade management solution employing an expanded set of over 200 lists so that our restricted screening process keeps pace with where we are growing with our clients.

Check your batteries: Not only were recent year, high-profile aircraft incidents attributed to lithium batteries, but even popular news reports of battery accidents in consumer goods seem to drive heightened scrutiny of moving batteries and products with batteries across the supply chain. Now is a good time to review the latest requirements internally or with your service provider to ensure people are trained and following the current regulations. You might also consider your strategic alternatives in shipping products with batteries to optimize the cost and speed of your shipments, given that these shipments classified as dangerous goods usually come with extra handling costs.

Should you keep an internal battery in a machine unit? It may be that you just created a larger, heavier dangerous good out of a machine than if you shipped the battery separately from the machine. Given the interoperability of many batteries, you might even consider sourcing batteries in your destination country and having them installed locally, bypassing the need to ship internationally altogether.

Choice Logistics' Global Trade Solutions group offers clients a single source solution to manage international trade, and we are helping clients right now on issues like these. Whether your needs involve trade compliance, consignment, direct sales, warranty or repair, we can facilitate and fulfill all of your IOR, EOR, and customs clearance requirements. From consultation to outsourced solutions, Choice manages customs, duties, permits, certifications, registrations and other regulatory requirements.

For more than 50 years, Choice has helped the world's leading companies better manage their global supply chains. We offer enterprise-grade warehouse, inventory, and transportation solutions throughout our network of 400 locations in more than 90 countries. Please contact us if we can help you with your operations

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So You've Decided to Invest in a Global TMS – Now What?

The benefits of a Transport Management System (TMS) are well recognized, allowing users to replace separate management systems for their different logistical needs with an end-to-end solution that allows shipments to be booked in just a few clicks, saving vast amounts of time and money. It's no wonder then, that so many companies are moving over to this way of operating for their global air and ocean needs. However, when choosing a TMS, it's important to ensure that it will meet all of your requirements, and while each company's need is unique, there are several features you should look out for.

Complete Supply Chain Visibility

Your TMS should offer end-to-end visibility of your supply chain, allowing you to book, track and trace your shipments all over the world from origin to destination, and easily view all bookings and shipping milestones – ideally with a simple search option to allow you to quickly find what you're looking for. This should also cover visibility of goods at Merge-in-Transit (MIT) facilities, and inbound shipments to ease planning. With goods travelling all over the globe, being able to consolidate them at individual locations and provide visibility to staff offers a solution to what was a huge obstacle under traditional systems.

Having all this information in a singular database will save time, cut costs and increase productivity. In many cases, these databases can be customized for each user, so while all the information is there, an individual's log in will only give them access to the data that corresponds with their unique responsibility.

Real-time Correspondence with Carriers

Of course, for this information to be truly useful it must be updated in real-time. A TMS that's integrated with your carrier will allow both parties to dictate exactly what information is transmitted, so carriers can give rates and complete bookings, sales orders can be imported, and corresponding documents can be edited, cloned, returned and sent to additional parties, all as soon as it happens. It also allows for instant tracking, as soon as bookings occur, so you're always up to speed.

Automated Documentation

Automating the generation of documentation, such as shipping labels and bills of lading, so that it is produced alongside the shipment removes an additional step in the process, creating a more efficient process that leads to faster, increased on-time and accurate delivery to the final customer.

Reporting

Ask anyone what the best part of their job is, and it's doubtful that they'll reply with "the paperwork." Reporting is time consuming, and takes resources away from more profitable areas, so a TMS that will create reports automatically from real-time carrier analytics is a much more efficient solution – especially if these reports can be created via subscription to automatically pull the report at timed intervals, delivering a weekly or monthly overview without you having to do a thing. It's also a good idea to make sure reports are customizable and exportable, so they can be distributed straight away.

In addition to these core areas, many 3PL providers are finding new ways to add value to the services they offer, and make their processes more personalized, streamlined and efficient. Rather than an all encompassing solution where you'll be paying for features you don't use, choose a provider that can help you to identify your unique requirements and address those. For example "Hybrid 3PLs"' which by bundling software and shipping solutions are connecting all the dots from vendor to final customer, reduce steps in the process and allow for more concise operation. This highly sophisticated approach provides a truly integrated end-to-end solution that's much more precisely tailored to your individual requirements.

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Transportation 2016 (And Beyond): The Old Rules Don't Apply

Transportation is ever-evolving with current shipper concerns of growing truck driver shortages, severe capacity crunches, supply chain talent shortfalls, and tenuous customer service levels. Traditionally, shippers would pick up the phone to call a favorite carrier who would carry the load for an acceptable rate at the day and time requested. These manual transactions were inefficient and reactionary and only successful because the carrier would always accept the load. Gone are the days when a shipper could contract with a carrier and name their own freight price. Capacity is constricted with little to no room for increased demand.

In today's global, highly competitive market, the old rules of transportation no longer apply if you want to remain profitable and competitive. Today, shippers use digital technology like a Supply Chain Operating Network to create bi-directional communications with carriers – increasing efficiency and collaboration and enabling end-to-end visibility. Used effectively throughout the ecosystem, technology improves the entire process, adding value to the carriers and supporting "shipper of choice" initiatives.

How can you use a Supply Chain Operating Network to improve your logistics ecosystem? Consider these initiatives:

- Automate the tendering/booking processes to streamline the search for capacity
- Connect to multiple data sources to increase visibility to shipments in-transit
- Lower dwell times with scheduled appointments and ensure resources are available to help with loading and unloading
- Collaborate on freight assessorial costs to automate dispute resolution
- Become a preferred shipper by paying carriers correctly and on time
- Develop a management-by-exception model to improve efficiency of your own logistics operations team
- Share shipping schedules, load information and requirements so carriers know exactly what's needed

Leveraging the power of a network with one-to-many connections lowers implementation costs across the ecosystem, allowing you to implement these initiatives in record time. And of course, treating carriers and drivers as respected, valued partners earns and retains their loyalty.

Necessity is the mother of invention–with the increased pressure from these constraints comes innovation. In the next few decades, the supply chain will be completely revolutionized. Imagine what the Uber model will do to the economies of our transportation networks. Or driverless trucks. Or the Internet of Things. Even increased regulations will offer new sources of data as e-logging devices are implemented. With new transport technology growing exponentially, digital tools will revolutionize cost, capacity, and supply chain design. Today it costs $2.20/mile to run a truck; in 20 years the cost will be halved.

In previous years, transportation companies didn't want to be bothered with new technology, but succeeding in today's market requires technology savvy transport enterprises that replace manual and complex approaches with responsive and reliable ones. Joining a Supply Chain Operating Network can provide these organizations access to their customers without the usual investments.

One thing that is certain throughout the coming years is the proliferation of data. It will become more reliable, abundant and less latent. A Supply Chain Operating Network offers up this data in a usable way, enabling real-time collaboration, increased visibility, streamlined operations and improved customer satisfaction for a true competitive advantage.

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What Effect Will 3D Printing Have on Logistics and SCM?

The worldwide market for 3D printing grew at a compound annual growth rate of 35.2% to $4.1 billion (USD) in 2014, according to Wohlers Report 2015. The industry expanded by more than $1 billion with 49 manufacturers producing and selling industrial-grade 3D machines.

If 3D printing is going to have a major impact on how we make things, it will definitely have an impact on how and when we receive them. As one of the largest purveyors of Logistics and Supply Chain Management (SCM) services in the world, DB Schenker is looking closely at the impact 3D printing and other leading technologies will have on how we service our customers.

Getting clarity on future trends is why DB Schenker set up the Enterprise Lab for Logistics and Digitization at the Fraunhofer Institute for Material Flow and Logistics (IML) in Germany. The Lab combines Fraunhofer IML's research and development with DB Schenker's forward-looking global approach to find and develop innovative logistics solutions and process innovations.

As part of the project, access has been granted to Fraunhofer IML's Technology On Demand Laboratory and its connected workshops. This allows DB Schenker to develop prototypes more quickly and test them in working conditions.

"With this unique partnership, one of the things we want to achieve is the accelerated digitization of logistics processes," says Dr. Hansjörg Rodi, Chairman of the Management Board of Schenker Deutschland AG.

With a permanent staff of scientists, lab work will focus on 3D printing, the Internet of Things and Services, Industry 4.0, Big Data, Cloud computing and the transition from process to service. These research alliances are helping DB Schenker work on the transport and logistics solutions of the future.

One plan is to create an innovation radar for digitization in logistics that will permanently monitor the latest technologies and developments. They also aim to develop digital business models where one target area is to make use of 3D printing as an integrated part of our warehousing and supply chain services, while also leveraging unique competencies from the DB group such as engineering.

"Thanks to our partners from Fraunhofer as well as our colleagues from Deutsche Bahn, we have a very concrete picture of the capabilities of 3D printing," says Thilo Koch, Program Lead for global innovation activities.

"As a result, we are evaluating options to combine our vast logistics service portfolio with the new opportunities that 3D printing can offer. Spare parts, for example, will increasingly be seen as a service with a clearly defined lead time. Managing the complexity behind that service is where we can leverage our capabilities. This will add value for our customers by reducing interfaces and complexity."

According to an article published by the University of San Francisco in 2015 entitled, "3D Printing and Its Impact on the Supply Chain," there are a number of other ways that 3D printers may alter the supply chain including substantially reducing manufacturing lead times; shorter time-to-market for new designs; customer demand will be met more quickly; and logistics will adjust to print-on-demand, eliminating the need to carry inventory.

It's obvious that 3D printing will affect manufacturing and SCM. When you can create very complex items that used to be made on an assembly line, you eliminate the need for high volume production – as well as the workers employed at the factory. Leading logistics providers must become more efficient, more locally focused and more connected globally to succeed in the future.

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Thoughts on Independent Contractor Pitfalls

Hire. Employ. Train. These are a few words that can cost you dearly, should a governing entity decide it wants to look at your business model and how you utilize independent contractors (ICs). Do they wait at your location for their next job? Are your drivers in uniform? Do their vehicles have your logo on it? What happens if someone is hurt during one of your deliveries? What level of economic dependence do they have on your business? How do they run their business? Are you going to ultimately be held responsible for things that they do or don't do, that you cannot control? Are you ripe for a misclassification suit?

Here in Washington State, it is a huge hotbed of ugly. Possible misclassification can be enormously costly, not only with the defense but also with the audits, fines and lawsuits if you lose. Though we are one of the few monopolistic states (workers comp insurance is run through labor and industries; we cannot shop for carriers and quotes), an injury claim is one of the biggest triggers for an audit you can face in any state.

Does this sound familiar? You utilize an IC. He is doing a delivery, and during the pickup his hand gets injured. It will need medical attention, so off to the emergency room he goes. Sitting in admitting, he is asked if he was hurt while working. Well, yes, he was working. (trigger #1). Who was he working for? He gives them your name (trigger #2). Out comes the L&I (or Workers Comp) paperwork that has to be completed. You are now in the bullseye (insert sound of racking shotgun here).

If you want a good read, check out the "Administrator's Interpretation No. 2015-1" from the U.S. Department of Labor, Wage and Hour Division. I was first hopeful that there would finally be some clear guidelines, continuity and cohesiveness that would cross the boundaries of these governing entities' guidelines for which we are all held accountable. Although clarity is made for some issues, what is most clear is that collectively, the entire essay is indeed open to interpretation – their interpretation (not surprising, as the word is part of the title). It is also quite evident that the IC model is something in which they hope will go the way of the dinosaur.

I get it. How many companies use this model as a way to skirt the expensive cost of workers comp or other taxes? The potential loss in revenue can be staggering. However, for those that take the time to make sure their IC's are legit, that there are no controlling factors to the IC, and that do their level best to only use the ones that truly understand their role as a business owner, then great. You may very well be ahead of the pack.

It used to be that control was one of the biggest factors in determining the role of the IC. These days, less significance is given to control and much more to how your IC runs his business. If you have an IC that is kept busy contracting with your company, or is simply content just to do a few jobs here and there, then that could put another target on you and your company's back. It is indeed frustrating that as a carrier, you could be held to a misclassification for keeping some IC's busy. It's a bit of a Catch 22; you celebrate the growth of your business which allows you the opportunity to provide more work to your IC's which can then end up biting you on your backside. How similar is their business to yours?

Our goal is to be 100% compliant. Always. I see both sides of the coin on this issue and it is big enough to be a front runner on a daily basis to ensure your people (sales, dispatch and the IC themselves) are thoughtful in their approach in all manner of involvement. Your best defense? Some may argue its merits and the time and attention required to strive for 100% compliance. It is a difficult path, but necessary unless you prefer to live on the edge with your fingers crossed that you are never in the path of an audit. Take the time to do it right!

I realize this is somewhat simplistic and it is not meant to be an audit survival guide. The intent is to merely open up thought and awareness and perhaps a self-audit of your own business practices whether you are an I/C or a carrier that contracts them. Perhaps it will help you notice a hole that needs repairing or make you aware of potential pitfalls.

We utilize both employee drivers as well as ICs. As business owners, we are aware of the differences and how we can and cannot utilize them and have to look at each job to confirm if the driver is a good fit. Our customers have always been and will continue to be the most important thing to us and we cannot care for them without drivers. Our business has a place and process for its employees and also for the IC. The tightrope between them grows ever thinner. It is up to us to be vigilant about new regulations and interpretations that affect our industry and how it will impact our business.

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Real-Time Load Tracking: Improving Productivity and Customer Service, and Reducing Costs

Do you have a team of people who spend their time calling carriers, checking websites, filling out spreadsheets with EDI data, and answering endless inquiries from internal and external customers about where the truck is? It's an all too familiar story for manufacturers, distributors, and retailers across the country.

Did you install your dream TMS and, despite its strengths in many areas, it still can't tell you exactly when your shipment will arrive at the customer's facility?

If you answered yes to any of these questions, you need real-time load tracking. And yes, it's possible to get the information you want, at your fingertips when you need it, even if your carrier base is 100+ carriers strong.

A real-time load tracking platform gives you and your customer service team access to location information for all of your shipments, regardless of carrier. Instead of being built on outdated EDI technology, new offerings provide updates directly from the onboard GPS device your carriers use to track their own trucks. Combine that with cellphone tracking for small fleets and owner operators, weather and traffic information, and other predictive analytics, and you have a tool that enables you to manage exceptions proactively. Top platforms not only provide you with real-time location information, they alert you to potential issues, give you the information you need to take action on those loads, and allow you to view performance over time so you can target systematic issues in your supply chain.

Use Case: Customer Service

When customers (including internal customers, such as Sales or Warehouse Operations) reach out to ask for status, your agents will have answers at their fingertips, avoiding a call or email to the carrier. Their answers will be more thorough, accurate, and up to date–all provided by real-time information in one place.

Even better than providing quick responses is not receiving the questions at all. Given the cloud-based solutions on the market today, it's easy to expand the benefits of a real-time tracking platform to customers and internal stakeholders. Robust solutions will offer group access permissions to allow users from throughout your and your customer's organizations to view the shipments relevant to them and get the answers they need, without compromising privacy, security, and usability.

Use Case: Carrier Management

Tracking on-time pickup and delivery performance can be incredibly difficult. You're combining data from a variety of different sources, and often relying on self-reported data from the carriers. With a real-time tracking platform, you are able to see exactly when a truck arrived at your customer's facility. Historical reporting by carrier, customer, and region allows you to identify pain points. The added benefit of being able to drill down into the details of delayed and rescheduled loads gives you the information you need to impact your on-time delivery performance going forward.

Use Case: Warehouse Operations

According to the FMCSA, each year more than $3 billion is spent on detention charges at warehouses. Tracking platforms use geo-fencing that notifies the warehouse team of a truck's impending arrival–allowing you and your customers' warehouses to be prepared. Early notifications of delays and revised ETAs reduce surprises at the dock and your detention costs.

Being a Shipper of Choice

When it comes down to it, you want to ship your product in the most efficient and cost effective way. You tackle that through a variety of different methods and, if it isn't already, real-time load tracking should be one of them. Improved transparency between you and your carriers, fewer calls to their dispatch team, fewer calls to drivers while they are on the road, and a more informed shipping/receiving team all aid in making your transportation operation a well-oiled machine. Improve the service you provide to your customers, improve your relationship with your carriers, and reduce your costs at the same time–a real time tracking platform helps you revolutionize your logistics operations.

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Inbound Vendor Programs

A lot of attention is paid to the control and management of outbound shipping to someone's customers, but many times the expense of inbound vendor traffic and its impact on landed cost is overlooked. Sometimes because the buyers get no credit for managing freight costs of inbound shipping and expertise of the shipping staff is just that—outbound shipping where they see and touch the freight and meet with carriers each day. But whatever the reason, there is good cause to managing inbound vendor freight. But what is involved and how much energy and time will this take?

The first step will require a review of collected freight bills from those vendors who sell their product fob origin. Whether you route it or not you are paying for it. Nothing is free in this world. Second, you need to obtain a list from purchasing of all vendors, cleaned of all service suppliers. Once cleaned, a letter asking for cooperation needs to be drafted and signed by management, which will then be sent to the sales manager of the supplier. This survey will ask questions such as where does the product actually ship from, how frequently, who is being used now, and whether they offer a freight allowance (which is the difference for the cost of goods shipped fob origin or delivered).

This can be fairly tedious work since only half will respond in two weeks, which then prompts the need to follow-up with each vendor who didn't respond to get their answers.

"The accuracy and level of detail from your audit determines how well you can manage your freight program."

– **Heidi Calamusa,**
VP Business Dev/Process Improvement, Freight Management Inc.

Once received, this information needs to be checked against the last few orders you got from the supplier to verify the weight and product description. Rate these shipments against your present carrier rates you have or feel you can get. This can cover loads, less-than-truckload, ocean, air, and parcels. At this point you can decide which vendors are worthy to be routed in the effort to reduce landed costs.

It would be good to tie any routing effort into a TMS system that is connected to your carriers. This gains the buyers' support in your effort since they would now know when and where their shipments are without having to call the supplier when something is late. Buyers would know if it shipped on time and if it will arrive on time. Reports on such information can be pushed out. The accounting department needs to keep you abreast of any freight bills that come in from non-approved carriers, which should prompt a warning letter. Also, if an invoice from a vendor is showing a freight line item, a similar reaction should occur.

The whole concept of routing inbound vendor traffic does take a fair amount of set up and then it has to be administered to survive in the long term. Left to their own devices, a solid inbound routing program will dissolve over the months and years if not managed and reviewed.

It is also important to remember that freight allowances need to be updated on occasion. If there is a big spike in fuel surcharge costs the allowance will be increased accordingly. Communication with the supplier in a cooperative manner plus checking the reality each month or two will keep such programs alive and productive to the bottom line.

For more information, or a no-cost evaluation of your program, visit www.freightmgmt.com.

ECODEV

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Panama's SEA Change Boosts Access to Global Markets

Panama is quickly becoming the business capital of Latin America. The country is an attractive location to the international business community due to the $5.25-billion expansion of the Panama Canal, allowing for increased access to global markets. In addition, the country's economy is surging, and the Panamanian government is attracting foreign direct investment through the development of a new Panama Pacifico Special Economic Area (SEA).

Once completed, the Panama Canal expansion will allow post-Panamax ships to carry up to 13,000 TEUs. Approximately two-thirds of the Panama Canal's annual transits are bound to or from U.S. ports; as a result, ports around the world are spending billions of dollars in improvements to prepare for the influx of anticipated cargo.

Companies transporting goods can take advantage of Latin America's main highway, the Pan American Highway, which provides connections to Costa Rica, Nicaragua, Honduras, Guatemala, Mexico, and Tocumen Airport, the most connected airport in Latin America.

While having one of Latin America's most competitive and dynamic economies, Panama also offers a stable and low-risk economic environment. In 2015, the World Bank ranked Panama first in ease of doing business with among 22 locations in Central America and the Caribbean. Panama has the fastest and steadiest GDP growth rate in the American continent, expanding 6.2 percent in 2010, with similar annual growth forecasted through 2015.

Additionally, Panama is one of the only countries outside the United States where the U.S. dollar is the official currency, the workforce is bilingual (Spanish and English), and the local time operates on the U.S. Central Time Zone.

Attractive Incentives

The Panamanian government has played an instrumental role in the success of the country's economy. The government is committed to growing local businesses and attracting foreign direct investments to create new job opportunities. One example is SEA, a public-private partnership that provides favorable regulations such as special tax, labor, and legal incentives to companies that open a facility on the site. Developed by British company London & Regional Properties, the SEA is a mixed-use development with 3,450 acres of land assets.

A Single Location

SEA attracts global companies, especially those looking for a strategic location to consolidate their distribution, manufacturing, and back office operations. Located on the western bank of the Panama Canal, SEA is 15 minutes from downtown Panama City. More than 230 companies – including 3M, Dell, VF, Cummins, Grainger, BASF, PPG Industries, and Caterpillar – call the Panama Pacifico Special Economic Area home.

As SEA continues to be a top priority, the Panamanian government looks to further grow investment opportunities within a variety of industry sectors including multinational regional headquarters, shared services, ITC services and data processing, high-value manufacturing, research and development, maritime services, multimodal distribution, and logistics. ■


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IT MATTERS

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Five Driving Forces Behind Driverless Trucks

The introduction of driverless trucks could be the biggest change the transportation industry will ever see, and the concept is closer to reality than you might think. Vehicle manufacturers say drivers will still be essential in the next 10 years, and the technology will be there to assist drivers rather than take their jobs.

Daimler, one of the world's largest truck manufacturers, demonstrated a prototype truck that drove autonomously on an autobahn in Germany, and successfully navigated a junction in real driving conditions. The trucks are equipped with a Highway Pilot assistance system that allows them to navigate successfully at speeds up to 53 mph. Daimler's demonstration proved just how real the technology is.

There is no indication that autonomous technology will replace existing drivers in the future, but the technology helps free up drivers so they can work on other duties to maximize their time.

Here are the five driving forces behind driverless trucks:

1. The driver shortage. One reason behind introducing driverless trucks is the driver shortage crisis. As people shy away from careers in trucking, costs will rise for commercial operators and their shipper clients.

Autonomous vehicles will help alleviate the driver shortage, and offer the opportunity to enhance the driver's role. Drivers could become responsible for transport management duties that they can complete during the time the computer is in control.

2. Safety. Increased safety is an advantage of the autonomous truck. Public perception will demand absolute reliability with this new technology. The technology will need to be proven before any driverless vehicle is allowed on the roads. Any operation involving driverless vehicles on public roads will need to be part of a much larger regulation system.

3. Congestion. One of the leading reasons for the heavy investment in driverless truck technology is the potential increase in transportation efficiency. Predictions that road congestion will rise in the near future creates a need to break the link between economic growth and road transport.

German authorities predict that truck transportation volume will increase by 39 percent by 2030. The transport industry needs to use existing road capacity more efficiently, and driverless vehicles can help achieve this goal.

4. Technology. There have been major developments in driver assistance technology. For example, Daimler's Proximity Control Assist adapts the vehicle's speed, depending on traffic conditions, through an integral cruise control and braking system. Three-dimensional maps exist for a Predictive Powertrain Control system, while telematics products for driver and operator vehicle and transportation management have already been rolled out.

5. Costs. Throughout Europe, drivers are responsible for an estimated 45 percent of the total cost for motor freight carriers. Eventually removing drivers will have a huge impact on truck transportation costs and profits. ■


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Driver Coercion Rule: What Shippers And Carriers Need to Know

As a new truck driver coercion rule goes into effect, the need for communication with drivers is greater than ever. Motor carriers, shippers, receivers, and transportation intermediaries need to train drivers on the updated policies and procedures.

In November 2015, the Federal Motor Carrier Safety Administration (FMCSA) adopted regulations that prohibit drivers from being coerced to operate commercial motor vehicles in violation of certain provisions of the Federal Motor Carrier Safety Regulations, including those that relate to hours of service, drug and alcohol testing, and hazardous materials transport. The regulations were effective Jan. 29, 2016.

The driver coercion rule prohibits any threat to withhold business or to take adverse employment action against a driver for refusing to operate a commercial motor vehicle under conditions that would require the driver to violate federal regulations. One example of coercion is a motor carrier's threat to withhold drivers' dispatches unless they deliver a load that violates hours-of-service regulations. Another example of coercion is threatening to fire drivers if they refuse to operate an unsafe vehicle.

The rule's prohibitions apply not only to covered motor carriers, shippers, receivers, and intermediaries, but also to their respective agents, officers, or representatives. The rule applies to shippers and brokers when they assume the role normally reserved to the driver's employer.

Trained Responses

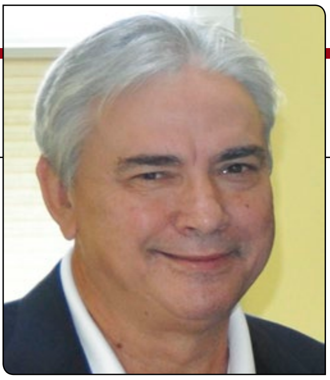
There is some concern that drivers can abuse the new regulation. For this reason, it is important to train dispatchers and other personnel in frequent contact with drivers how to respond when a driver indicates that a dispatch will lead to a violation.

Personnel should avoid instructions or comments that could be construed as a threat against the driver's employment or work opportunities. They should also have a conversation with the driver about the issue being raised and whether a violation would indeed occur. Certainly, a driver notifying the company of a potential violation is helpful information to promote safety and avoid adverse results. Even if there is no perceived violation, however, personnel should avoid communications, including texts and emails, that could be perceived to contain a threat.

Determining Violations

The rule generally puts the onus on drivers, who must communicate to their employers that they believe they are being persuaded to do something that violates a regulation. Drivers must file complaints of coercion with the FMCSA within 90 days. They also must provide information, such as their name and address, and the name and address of the person allegedly coercing them, along with any evidence. At that point, a FMCSA division administrator will determine if the complaint is nonfrivolous. If the complaint is valid, the division administrator will investigate.

If division administrators determine a violation has occurred, they may issue a Notice of Violation or a Notice of Claim, which are established FMCSA interventions. A Notice of Violation is an informal mechanism to address compliance deficiencies, while a Notice of Claim is issued in cases where regulatory violations are severe enough to warrant assessment and issuance of civil penalties. Violators could potentially face a $16,000 fine per violation and, in extreme cases, a loss of operating authority. ■



BY DAVE SILVA
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Shedding Light on DIM Weight Returns

Volume shippers who send most of their goods to customers via parcel carriers know that a pound is not always a pound. Dimensional, or DIM, weight is a significant issue that can add up to millions of dollars in shipping expenses. For e-commerce shippers, customer returns are inevitable. Without a clear understanding and plan for managing returns, DIM weight expenses can easily challenge budgets and profitability.

Many Internet businesses offer customers an easy returns program, which has been proven to be a key customer expectation. The company provides a return label for the customer, and charges a flat fee. But is this enough? Are DIM weight charges wreaking havoc with the customer service-oriented program?

Calculating DIM Weight

DIM weight is the actual space a package occupies. It is determined by multiplying the dimensions of the package for the total cubic inches, then dividing the total cubic inches by a dimensional factor, which each carrier provides.

For example, the UPS dimensional factor for a domestic ground shipment is 166. The result of that calculation is the DIM weight of the package, which is then compared to the actual weight. The greater number becomes the billable weight.

Many retailers, notably Amazon, have discussed the struggles of balancing the consumer's demand for free or low shipping costs with the true cost of shipping, especially when orders are consolidated from multiple parties, as is the case with Amazon's marketplace vendors.

On the outbound side, fulfillment centers with warehouse management systems and packing logic are still challenged to get it right and use the correct size box to minimize DIM weight charges. On the returns side, Internet businesses provide the customer with a shipping label. Box selection for the return item is left to the customer's discretion. Even if customers use the vendor box, they may be returning only one of many items they purchased. The return parcel could have a fair amount of space in the package, making it a target for DIM charges.

Recently, I was reviewing freight bills for an Internet client, and noticed a significant number of packages with DIM weight charges. When I drilled down, a number of these packages were returns. The Internet business was inserting a UPS ground-shipping label with the outbound order, and charging the customer a flat fee of $7.95. I also noticed a number of packages were being dimmed an additional three to five dollars per package. Some packages had even higher costs over the actual weight, for example, a $40 DIM charge vs. a $7.50 actual weight charge.

It's Up to the Shipper

Most customers have no knowledge of DIM weight charges or the formulas that they should use to ship. It's all on the shipper to get the return logistics right. That creates considerable financial exposure and negative impact on the business' profitability.

More concerning is that many businesses don't have tracking mechanisms in place for their returns programs, and frequently do not know if the program is costing them money. Fewer have safeguards in place.

Most Internet businesses don't pay as much attention to returns as they do to outbound freight expense, and that's a serious risk to the business, especially in these days of increased competition and heightened customer expectations.

Almost certainly, low-hanging fruit is sitting in your returns department, and the time could be ripe for introducing a returns assessment program. ■

RISKS&REWARDS
Issues Affecting Liability Management

BY STEVE WOOD
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Serialization: It's the Real Thing

To help combat counterfeiting, the premium beverage industry is taking advantage of serial numbers on product packages to uniquely identify products for increased connectivity throughout packaging operations and the supply chain. Premium beverages such as expensive wine, whiskey, and cognac have become an increasingly active market for counterfeiters in China, India, and Russia.

It's easy for counterfeiters to replicate premium beverages. For starters, the empty bottles for the real products are valuable commodities. Enterprising bartenders place empty premium beverage bottles in a recycle container, which counterfeiters purchase at high prices.

The counterfeiters then fill the bottles with a concoction from their processing factory and prepare them for final packaging.

Given the availability and low price of used digital label printing systems, counterfeiters can precisely replicate side and cap seal labels so it is virtually impossible to distinguish a fake bottle from a genuine one.

Keeping Tabs on Product

Assigned serial numbers, similar to ones used in pharmaceutical and food industries, can be linked to a database to track individual product from its place of packaging, through its distribution system, and into the hands of consumers. A serial number is printed on the label of a bottle and can be used to authenticate the product, track it through the downstream supply chain, and monitor trade for grey market diversion.

The serial numbers are typically a 2D/Data Matrix or QR barcode, as well as a number, for ease of consumer use. Serial numbers are printed on the label and each subsequent packaging level–carton, case, and pallet–is then linked to a cloud-based database, which keeps a record of each event related to that product.

To provide higher levels of security, the serial numbers can be linked to package security features. Consumers are able to authenticate the product and check its chain of custody by scanning the barcode with a mobile phone or by entering the code into a Web-access application.

Companies can use data collected through serial numbers as a powerful and cost-effective tool to combat counterfeiting and supply chain leakage. This data can also help improve an enterprise's operational efficiencies through the use of tracking systems such as enterprise resource planning, customer relationship management, and manufacturing execution systems.

Building Consumer Loyalty

Other business benefits, including interfacing with consumer loyalty programs, can be realized through the use of serial numbers, which help establish a direct relationship between the brand owner and the consumer. This creates a channel to communicate marketing information that is a source of real-time consumer feedback and opportunities to mine additional market data.

Serialization-based brand integrity programs give consumers confidence in a premium beverage. Through the use of serial numbers, companies can stop counterfeiting and supply chain leakage, as well as connect with consumers and build brand affinity. ■


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BY MARK MORLEY
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Greening Your Supply Chain With B2B Automation

Today's businesses are under increasing pressure to develop more sustainable supply chains, typically part of a broader Corporate Social Responsibility (CSR) initiative. With reducing carbon emissions a cornerstone of many CSR-related programs, developing greener logistics and supply chain networks is key.

Replacing manual, paper-based processes with fully automated systems that use electronic business-to-business (B2B) transactions is one major step toward a greener supply chain. Removing thousands of paper-based transactions can amount to a significant sustainable saving across an extended enterprise.

Companies usually send electronic B2B transactions across a cloud-based business network that connects with their global trading partner community. The business network effectively exchanges documents in electronic form—including purchase orders, invoices, advanced ship notices, and order acknowledgements—regardless of industry or business process.

The Environmental Paper Network, a coalition of more than 100 non-profit organizations, developed a comprehensive tool to evaluate the environmental savings a company can realize by removing paper-based transactions. For example, automating the exchange of 1 million paper-based invoices per year represents a saving of nine metric tons of paper or 228 trees. This also saves 375 million BTUs or the equivalent energy saving from four houses per year, and reduces CO_2 emissions by 55,877 pounds or the equivalent reduction from five cars per year.

The numbers tell the story: Automating paper-based supply chain transactions is a key step in developing more sustainable supply chains.

Today's chief information officers are quickly deploying cloud-based environments that offer many operational benefits, such as improving infrastructure flexibility to react to changing market conditions or demands. Cloud environments also improve the predictability of the long-term fixed costs of managing business applications.

Companies can choose to automate B2B transactions through on-premises, cloud, or hybrid applications. Selecting a cloud-based business also offers the following indirect benefits:

- **Lowers power consumption requirements.** Having an outside provider manage internal servers, networks, and communication equipment also removes the need to manage utilities infrastructures such as power, lighting, and air conditioning.
- **Reduces equipment packaging.** Outsourcing server and communications hardware eliminates the need for cardboard boxes, wooden pallets, plastic, and polystyrene packing.
- **Minimizes travel for implementation and support teams.** The Software-as-a-Service deployment model allows companies to enable global trading partners quickly and remotely.
- **Transforms how employees access electronic business documents, any time, any place, or anywhere via the "mobile app economy."** Cloud-based delivery allows low-powered, mobile devices to access these lightweight software applications.

Utilizing a global business network can transform business processes, improve customer satisfaction, reduce operational costs, and, subsequently, develop more sustainable supply chain environments. Adopting such a network today will ensure that your company is better positioned to fulfill CSR initiatives and embrace any form of digital disruption that may impact your business in the future. ■


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SMART MOVES

BY SHAY SCOTT
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Eight Ways to Find and Retain Qualified Supply Chain Talent

The burgeoning need for talent to operate today's complex supply chains has begun to garner significant attention. Not only are supply chain management roles expanding at a rate outpacing qualified new graduates, but supply chain is also rapidly becoming more complex, creating the need for existing personnel to dramatically retool their skill sets.

These trends are likely to increase as baby boomers retire and the U.S. economy continues to grow.

The most successful companies have already begun to create new ways to find, recruit, develop, and retain talent to meet their needs.

In the recent whitepaper *Supply Chain Talent, Our Greatest Resource*, the University of Tennessee's supply chain faculty interviewed leading companies to identify the best practices they use to obtain top supply chain talent. Here are eight of these practices.

1. Define your ideal candidate. Marketing teams spend significant resources determining who their customer is, and supply chain and human resources professionals must do the same if they hope to find the best candidates. Defining technical qualifications is not enough — successful organizations also articulate culture, passions, and soft skills.

2. Use mentors. Deploy the right resources to promote individual development as a best practice. Research shows new hires do substantially better with an active sponsor, and top talent develops faster and better with active mentors and sponsors.

3. Create skill and development plans. Effective skill and development plans start by defining the skills needed to be successful in the end-to-end supply chain, in a particular supply chain discipline, and in specific job roles. This requires an ongoing effort by leadership and human resources to align, document, and communicate these skills as supply chains evolve.

4. Recruit from internships. Benchmarked companies hire between 60 and 90 percent of all new employees from internships and cooperative education. These provide an opportunity for companies and students to determine whether they are a good match.

5. Partner with top universities. None of the benchmark companies in this study view Internet-based recruiting as a productive tool due to the onslaught of unqualified applicants and the time commitment required to filter them. Instead, top companies forge partnerships with schools to supply the talent pipeline.

6. Develop top talent systems. A formal system for preparing future supply chain leaders is a prerequisite to closing the talent gap. Top talent should receive educational opportunities, developmental assignments, and coaching to develop properly and feel valued during the process.

7. Hire for the overall supply chain. Effective organizations view technical mastery as a threshold skill and focus on identifying candidates who can see the overall, integrated supply system. This requires finding talent who are capable of succeeding in multiple business functions. This approach has the added benefit of boosting retention as people want a career with a company.

8. Active diversity program. A strong plan to create a diverse culture must be a key component of each hiring best practice. ■

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VIEWPOINT

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Building Strong Supplier Relationships: Procurement Takes the Lead

As external forces change the expectation of procurement to be more than just the cost police, it's up to procurement professionals to embrace the role as strategists and advisors. As a leader, it is important to cultivate and maintain good supplier relationships to ensure profitability.

Companies struggle in relationships with suppliers for many reasons. For one, they may not understand that they shouldn't treat all suppliers alike. Or, they may not realize that suppliers can deliver more than just a good price on a widget.

Because supplier relationships are critical to a company's profitability and competitiveness, what's the solution to this struggle? The answer is a strong team of professionals from three areas – procurement, the business unit, and suppliers – who understand how to help drive value throughout the supply chain.

Here are steps procurement professionals can take to ensure they're valued members of the team and not viewed simply as the cost police:

1. Gain information to do more than just review vendors through an RFX and negotiate terms. Learn everything you can about the function you support. Study the product or service – its components, manufacturers, how the product or service is made or comes together, the length of time it takes, and the total cost of ownership.

2. Understand where the business unit fits into your company's profitability objectives. Look forward and anticipate future trends to identify potential supply chain opportunities or problems. Then you can start thinking about solutions.

3. Reach out for additional training if you lack the skills to assess and manage information generated both internally and from suppliers. If you don't, you'll miss out on the opportunity to build a powerful strategic advantage that can help your company reach its profitability goals.

4. Determine what category your supplier falls in. Then you should know the value each brings to your organization. Supplier categories include:

Strategic suppliers are superior to all others in terms of quality, service level, and cost. Work with these suppliers closely, share information regularly, and solve challenges together. Companies typically have two or three strategic suppliers.

High volume or leveraged suppliers: These suppliers offer a component, product, or service you can switch out easily enough, but requires a large spend. It's best to keep options open to switching these suppliers.

Bottleneck suppliers: If you don't have their product, you can't produce yours. Keep them happy to get your supply when you need it, or keep extra inventory of their product on hand.

Consumable suppliers: Provide products readily available at a low dollar volume. Because these suppliers don't require a lot of oversight, automated purchasing works best. The supplier provides regular reports and possibly enables technology for self-service.

5. Demonstrate your knowledge as you collaborate with other members of the team. Use your knowledge of the product or service, and its market, to build strategic relationships with suppliers. Good relationships provide a competitive advantage in addition to keeping costs down.

6. Focus on improving company success, not just procurement performance. Engage stakeholders to understand their needs. ■

BY STEVE LEAVITT
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How to Stand Out in a Crowded Marketplace

Whatever your business, the success of any company depends on its ability to define its value proposition, and then execute the vision precisely and consistently throughout the organization. Defining a company's core value proposition requires patience, as well as a deep understanding and appreciation of your customers' needs and your core competencies.

Nearly 30 years ago, I owned and operated fast food restaurants, and I made a critical error in judgment. I didn't know it then, but that negative experience taught me a lesson that prepared me to draw parallels between the act of buying a burger and my current business—shipping.

Defining a Value Proposition

When fast food chains gained momentum, my family's hamburger restaurants failed because we didn't hold true to our core products and service offerings in the face of new competition. When we tried to become exactly like our competitors, we lost focus on what defined our customer experience and what made us unique. I was determined to not make that fatal mistake again.

I faced the same challenge as the leader of a growing third-party logistics (3PL) company.

Our initial success was dependent on the performance of the individual franchisee. It was not the result of a well-thought-out and communicated brand that was consistent across our operation. Systems, processes, and the customer experience varied from one franchise to the next. I quickly realized it was necessary to define our value proposition and have it permeate the franchise system. Our value needed to be clear, concise, and easily replicated.

We initiated a branding process that allowed us to gather information from our franchisees and customers. What did customers value most? How did this compare to what competitors were offering? What were franchisees passionate about and how did this resonate with core customers?

Based on this information we were able to develop a positioning statement and a value proposition. We needed to go beyond price and offer a service experience that was unique to our core customers, and made them feel valued.

The hardest part of standing out from the crowd is sticking to your core value proposition. As industries evolve and new competitors join the fray, it's easy to be swayed to follow the crowd. It can be tempting to replicate someone else's success. But if you are the same as others, you have lost what makes you different and valuable to your customers, which means you can be replaced.

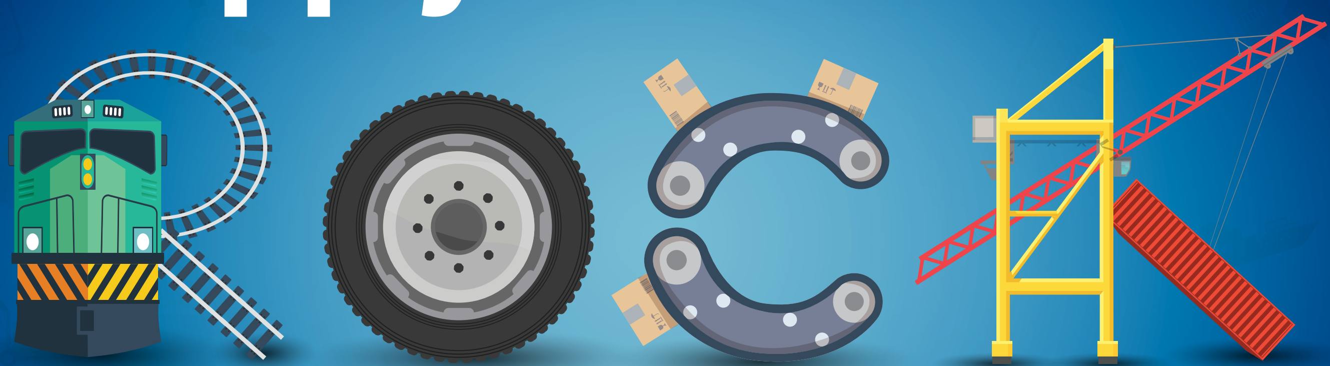
Stay the course by looking at every partner you do business with, every experience your customers have with your brand, every employee you hire, and every product you develop. Remember to ask, "How does it fit with the brand?" If it doesn't, consider an alternative.

Going Beyond the Transaction

As the owner of a fast food restaurant, I learned the appeal for the customer wasn't just about the burger. The same applies to the customer experience with any business. As a 3PL, it's not just about the shipment. With so many choices available, varying freight, and small package shipping needs, the 3PL service offering needs to be about more than the transaction. That means identifying what customers appreciate about the services and what keeps them coming back.

Whether you provide a product or a service, you must continue to innovate within the confines of your brand. Innovation for its own sake is not a strategy for long-term success. You must pursue and seek solutions only as an extension of your core brand. ■

Supply Chains That



Around The Clock

While most of us are sleeping, shipments are moving 24/7 to keep supply in perfect concert with demand. These hall-of-fame transportation and logistics companies make it happen, and ensure your shipments don't miss a beat.

ROCK AND ROLL ALL NIGHT

Meet the Kings of the Road – a two-person sleeper team hauling a two-trailer set filled with LTL freight from Chicago to Denver.

BY MERRILL DOUGLAS

The sun has yet to show its face, but at YRC Freight's distribution center in Chicago Heights, Ill., workers in the freight yard and on the loading docks have been busy for hours. For some of them, the task at hand is to fill two 28-foot trailers with LTL freight, preparing a two-trailer set for a trip to Denver.

The loads going onto those trailers arrived during the night from YRC facilities in Columbus, Ohio; Grand Rapids, Mich.; Milwaukee, and other midwestern cities. They include all kinds of commodities shipped by retailers, wholesale distributors, manufacturers, and government agencies. Many of those products came packed onto skids, but workers are also loading single cartons and bulk commodities packed in barrels.

With years of experience to guide them, the dock workers make the most of the space in each trailer, fitting in as much freight as possible while keeping each load safe, and not exceeding legal weight restrictions. They have plenty of tools to help them assemble this puzzle. As they load a trailer, they slide decking bars into grooves in the walls to make a racking system, so they can stack one load above another without direct contact. They also inflate dunnage air bags and position them between loads, to keep goods from shifting from side to side.

Once the dock professionals finish loading the trailers, two drivers—we'll call them Jim and Brian—report to the Denver-bound equipment to get ready for their trip. Although YRC employs women drivers, and some husband-and-wife and father-and daughter teams, most of its drivers are men. As a sleeper team, they'll be able to make the trip to Denver in one shot, keeping the wheels rolling almost continuously.

HIT THE ROAD JACK

Each driver double-checks his wallet to make sure he has his commercial driver's license. The team also looks over the manifest for the load. Finding that one of the shipments on the rear trailer contains a poisonous liquid, Jim affixes the correct hazardous material placard to the outside of that box. Finally, the drivers do a pre-trip safety inspection, making sure the tires are properly inflated, the lights all work, and the truck is otherwise ready to hit the road.

Jim and Brian also stow toiletries, extra clothes, and other personal belongings in the sleeper bunk's storage compartments. Located behind the driver and passenger seats, the bunk doesn't boast any frills. But it's clean and comfortable, equipped with a mattress. YRC provides a linen allowance that drivers use to purchase their own bedding.

Jim is the day shift driver on this team, so he climbs into the driver's seat. He makes a notation in an Hours-of-Service (HOS) logbook to indicate the time he is starting to drive. Brian, the night shift driver, will make a similar notation when he takes over the wheel. U.S. Department of Transportation regulations require all drivers to keep these logs. Some trucking companies today use electronic systems to record HOS, and pending legislation may soon require e-logs in all trucks. But currently, YRC uses paper logs.

Once the two trailers are hooked up and ready to move, Brian climbs into the bunk to get some sleep. Jim steers the truck

To help drivers rock around the clock, YRC trucks are equipped with advanced safety technologies, such as collision mitigation, active braking, and lane departure warning.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Dock workers make the most of the space in each trailer, fitting in as much freight as possible while keeping each load safe.

YRC drivers can safely handle any challenges they encounter on the road. Of its approximately 12,000 employees who hold CDLs, 2,250 have logged one million or more accident-free miles.

out of the distribution center and makes his way along local roads to the interstate. The tractor he's driving comes with a host of advanced safety technologies, such as collision mitigation, active braking, lane departure warning, and blind spot detection. The cab is also equipped with a satellite radio system.

One thing the tractor doesn't have is a satellite-based communications and tracking system. Because LTL linehaul trucks drive the same routes over and over, with well-established drive times between any two points, YRC doesn't need to track a truck's location in real time.

A driver communicates with a dispatcher upon leaving one terminal, and again when arriving at the destination. Unless he runs into delays, there's rarely a reason to communicate in transit. But nearly all of YRC's drivers carry cellphones, which they may use for personal or business-related calls when they're not driving.

After about three hours on Interstate 88, Jim crosses the state line from Illinois, entering Iowa near Davenport. A while later, he comes to the state weigh station in Altoona, Iowa, its sign lit to indicate that trucks are required to enter.

Yard workers back in Chicago Heights weighed the truck to make sure its gross weight didn't exceed legal limits and the weight was properly distributed over the axles. Inspectors at the weigh station might or might not ask Jim to drive onto a scale to confirm those numbers. In any case, those inspectors will conduct one of three kinds of inspection: Level 3 (a review of the truck's paperwork), Level 2 (a paperwork check plus a walk-around safety inspection), or Level 1 (a paperwork check plus a detailed inspection of the driver, the vehicle, and the cargo).

Back on the road, Interstate 80 now, Jim rolls along without incident, listening to music while keeping his main attention on the road. As the morning progresses, Jim notices a buildup of dark clouds ahead. Soon, the sky has turned a deep charcoal, and heavy drops start hitting the windshield.

Eventually, those drops become a shower, and then a torrent. Wipers sweeping, Jim turns off his cruise control so he can slow the truck and maintain the safest possible speed as conditions change. But visibility grows so poor, he decides that the safest course is to pull off the highway as soon as possible. At the next exit, he steers the truck to the nearest large parking lot and waits patiently until the storm passes. Then he gets back on the road.

YRC's drivers are well-equipped to handle severe weather and other hazards they meet on the road. According to the company, of its approximately 12,000 employees who hold commercial driver's licenses, 2,250 have logged one million or more accident-free miles on the road.

RUNNING ON EMPTY

By about 1 p.m., Jim is ready for lunch and a chance to stretch his legs. Federal law allows a trucker to drive for eight hours before taking a 30-minute break. And since they're paid by the mile, drivers try to keep their stops infrequent and short. But Jim is hungry enough that he doesn't mind stopping now. So the next time he comes across a truck stop, he pulls in. Brian wakes up at about the same time, ready for some food as well.

Truck stops with full-service restaurants that cater to professional drivers still exist, but they're becoming a rarity. Most facilities have evolved into "travel centers," featuring fast food outlets such as McDonald's, Pizza Hut, and Arby's. Some drivers miss the traditional restaurants, which offer larger menus, healthier choices, and a chance to socialize with fellow truckers and wait staff. Others prefer the chance

to grab a meal at a familiar chain and get back on the road.

At their travel center, Jim and Brian visit the restroom and enjoy a quick meal, with large coffees. They also drop into the retail shop for a few supplies. The travel center offers showers, but neither driver feels ready for one right now. The facility also offers diesel pumps, but it's too early in the trip for a fill-up.

The truck continues west on I-80, with Brian now in the passenger seat. The sign at the first weigh station in Nebraska is unlit, so Jim and Brian are allowed to cruise past.

STUCK IN THE MIDDLE WITH YOU

All goes smoothly until they get to the outskirts of Omaha, where traffic slows to a crawl. Because Brian isn't driving, he can check for traffic information on his phone. He learns a three-car auto accident ahead has closed multiple lanes just west of an upcoming construction zone. Unless things clear up soon, the backup will put Jim and Brian behind schedule.

Brian calls his dispatcher to alert him about the problem. If Jim were driving alone, this call would have to wait until he found a place on the road where he could pull safely onto the shoulder and stop the truck.

Employees at the Denver distribution center start checking to see if this delay will make any of Jim and Brian's loads late at their ultimate destinations. If that's the case, they'll notify the customers.

The dispatcher also checks on Jim and Brian's next assignments, to see if the delay will affect their ability to make the necessary connections. It looks as though they will be fine. This news is a relief to the two drivers; a missed connection could translate into missed miles on the road, and reduced pay, unless the dispatcher finds them an alternative trip.

Fortunately, Jim and Brian find themselves moving at ordinary highway speeds within about 30 minutes. They continue to make their way across Nebraska, listening to Bruce Springsteen on the satellite radio and chatting, mainly about their families and sports.

YRC offers transportation throughout Canada, Mexico, and the United States, including domestic ocean service to Alaska, Hawaii, Guam, U.S. Virgin Islands, and Puerto Rico.

As afternoon turns into evening, the two drivers are ready for dinner and a rest stop. It's also time for Jim to start his rest period. They grab a meal at a truck stop and take quick showers.

ON THE ROAD AGAIN

Brian takes over the wheel, while Jim moves into the passenger's seat. Back on the highway, the drivers settle in to listen to talk radio as the truck continues westward. Later, Jim retires to the bunk, and Brian slips Disc 3 of an audiobook mystery into the truck's CD player. His main attention is on the road, but the story helps the miles go by.

The overnight run is generally uneventful. Brian enjoys a couple of protein bars and coffee from a thermos as he drives across the prairie. Entering Colorado, he makes a quick stop to refuel the truck and use the restroom, and then starts the last leg of the trip. Soon, the lights of the Denver metropolitan area appear on the horizon. It's still dark when he pulls the truck into the YRC terminal in Aurora.

Yard workers unhook the two trailers and pull them to a pair of docks for unloading. Some of the freight will go onto local delivery trucks for transportation to consignees in the Denver metropolitan area. Some will go to satellite facilities in places such as Colorado Springs and Clifton, Colo., for local delivery in those areas.

Meanwhile, other workers hook a new pair of loaded trailers to Brian and Jim's tractor. The drivers gets ready for another linehaul trip, this time to Bloomington, Calif. Before long, they are back on the road.

This composite account of a linehaul LTL shipment is based on information provided by Howard Moshier, senior vice president of operations, and Mike Williard, director of linehaul operations, at YRC Freight, based in Overland Park, Kansas. YRC Freight is a subsidiary of YRC Worldwide, which was formed in 2003 through the merger of Yellow Transportation and Roadway.

EVERYBODY'S DOING THE LOCOMOTION

An intermodal container takes The Midnight Train to Georgia...or to any state that needs a shipment delivered.

BY MERRILL DOUGLAS

A typical intermodal shipment on a Class I railroad such as Union Pacific takes three days; moving the container on and off port adds extra time.

Just as Rome wasn't built in a day, not every logistics operation runs from start to finish in just 24 hours. Freight railroads work around the clock, but in the course of a linehaul journey on a Class I railroad, usually the earth rotates on its axis several times.

An intermodal container carried by Union Pacific (UP) from the Port of Los Angeles and Long Beach to Dallas typically takes about 77 hours—roughly three days. The work of getting the container off the port and onto a train adds extra time.

A 40-foot container loaded with housewares has been crossing the Pacific on a containership for the past two weeks. The owner of the product, a retail corporation, contracted with the ocean carrier to move the load from origin to a distribution center (DC) in Dallas. In the language of international trade, this retailer is known as the Beneficial Cargo Owner (BCO).

The ocean carrier, in turn, has contracted with Union Pacific to move the container from the Port of Los Angeles and Long Beach to the railroad's Dallas Intermodal Terminal.

It takes about three days for workers to unload the containership at the on-dock terminal. UP contracts with a vendor to transfer containers on a train operated by Pacific Harbor Line (PHL), the port's short-line railroad. PHL, in turn, interchanges the containers to UP.

Workers may use various kinds of equipment in these transfers. One example is a rubber tired gantry crane, which lifts, moves, and stacks containers. Another device, called a packer, resembles a giant forklift.

LIFE IN THE FAST LANE

Use of an on-dock terminal allows our container to start its journey quickly, since there's no need to truck it through surface traffic in and around the port complex. But some containers that land in Los Angeles/Long Beach get into the UP system by a different route. The ocean carrier or the BCO hires a drayage truck to haul the container to UP's Intermodal Container Transfer Facility (ICTF) in Long Beach, about five miles from the port.

The ICTF has five published cutoff times for receiving Dallas-bound freight in Los Angeles. If the container enters the gate before the cutoff, UP does its best to load it on the next scheduled train.

Along with the container, UP receives an electronic data interchange (EDI) message from the ocean carrier, containing a waybill. This document includes the container's origin, destination, and weight, plus a document billing reference number. UP will retain this information for 15 days—until well after the delivery is complete—and then purge it.

The container reaches the terminal at 2 p.m. on Monday, well before the 4 p.m. cutoff time. That allows UP to load the container onto the first train scheduled to leave after 4 p.m. UP's goal is to get this train to Dallas within 77 hours of that 4 p.m. cutoff, which makes the expected arrival time 9 p.m. on Thursday. For the majority of containers originating from the on-dock terminal, UP provides services for daily departure.

As the container makes this trip, UP will send the ocean carrier continual updates

on its progress via EDI. Customers who don't use EDI have multiple options to track and trace their shipments via mobile applications, UP's website, or by calling the company's National Customer Service Center (NCSC). The ocean carrier, in turn, relays status information to its own customer, the retail company that owns the cargo.

Although this container leaves Los Angeles on time, situations occasionally arise that can cause delays at the terminal. Sometimes there are so many outgoing containers in the yard that the next scheduled train reaches its maximum allowable length, forcing the railroad to leave some containers behind. UP will load those containers, called miss outs, on the next train.

In other cases, there isn't enough cargo to build a train that meets minimum length requirements, so the train doesn't leave. Shortages of locomotives, crew, or rail cars also can keep trains from leaving on schedule. Other situations can contribute to a delay; however, those are situational and occur infrequently.

If any such delay occurs, customers learn about it and get updates on the status of their loads via EDI, the UP website, or the NCSC.

UP uses a two-person crew to operate each of its trains. The conductor and engineer who take the train out of Los Angeles both live nearby and are assigned to a specific geographic area, with the port as the hub of their territory. Crew members often begin their careers at UP as switchmen, working in the freight yard to switch trains from one track to another.

Train crews are on call 24/7/365. When the call comes, a crew member often has just 90 minutes to report to work.

NIGHT MOVES

Now, as train crew, they're part of a chain of people who are responsible for getting the train safely from origin to destination. Although their territory is fixed, their hours are not. They work variable schedules: Some days a shift might last eight hours, and some days it might last as many as 12. Also, train crew are on call 24 hours a day, 365 days a year. When the call comes, a crew member often has just 90 minutes to report to work.

The conductor is responsible for the entire train, freight, and crew. The engineer's job is to operate the locomotive. Both stay in continual radio communication with dispatchers at UP's Harriman Dispatching Center, a massive complex of people and technology located near UP's headquarters in Omaha. Together with colleagues in six satellite facilities, dispatchers at the Harriman Center coordinate the safe movement of trains throughout UP's network, which spans 23 states.

The route our container follows from Los Angeles to Dallas takes the train on a southeasterly course through Tucson, Ariz., and El Paso, Texas, before angling northeast toward Dallas.

Along the way, trackside scanners collect data from automatic equipment identification tags installed on the sides of freight cars and locomotives. These radio frequency identification tags are similar in technology and function to the tags used in some warehouses and retail stores to track inventory. They are one source of data that UP uses to keep customers informed, via EDI, about the status of their freight.

Federal regulations allow train crew members to work for up to 12 hours. After that, they must get at least 10 hours of rest. As the train moves along its route, it stops periodically at a freight yard or crew change point to release the conductor and engineer and take on the next crew. A crew van

Yard dogs—trucks that only move trailers from spot to dock—stand by to stage containers for rail transport via Union Pacific.

delivers the fresh crew to the change point and picks up the two who are ending their shifts. Depending on the location and time, the van might take those crew members home, or it might deliver them to a hotel to rest up before starting a new assignment.

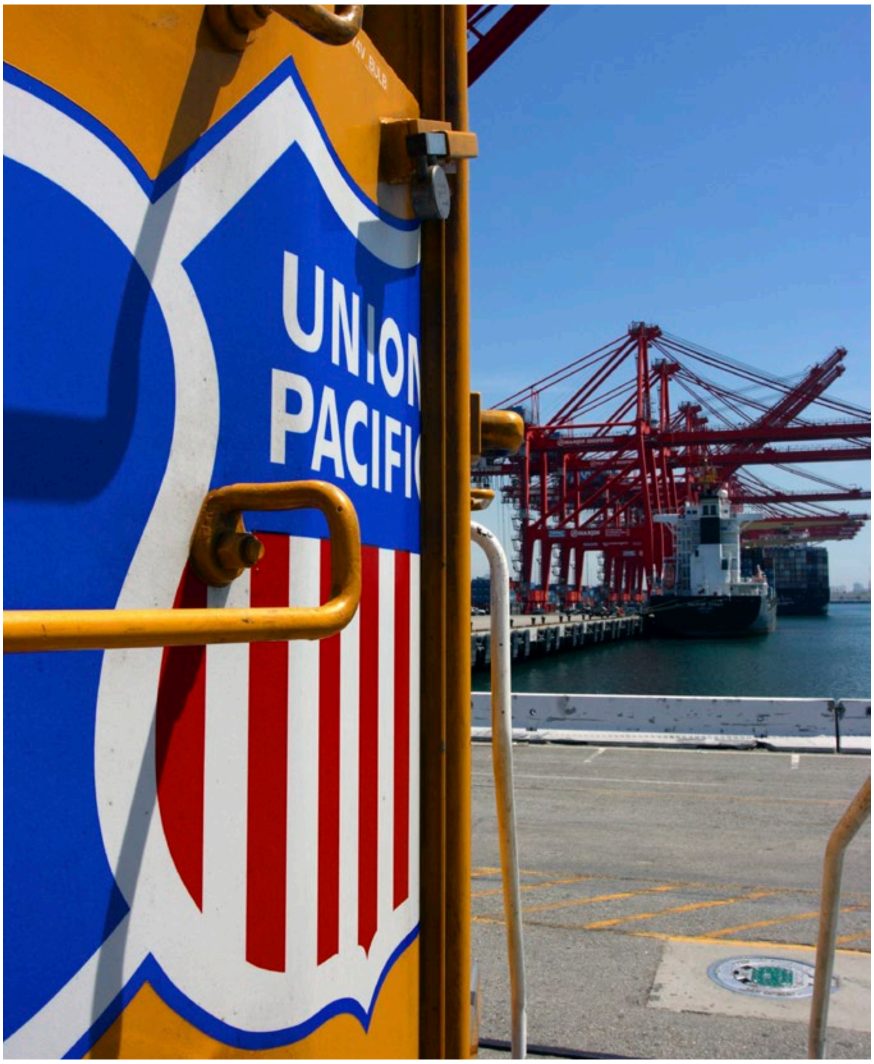
Some trains on the route from Los Angeles to Dallas stop along the way to pick up or drop off containers, but this one doesn't. Other, unexpected, situations might force a train to stop, sometimes for hours. For example, a storm might blow through, making safe operation impossible for a time.

Or — just as an over-the-road truck might encounter construction that forces traffic to a standstill — the train might come upon a crew performing Maintenance of Way work on a section of track.

Mechanical issues might also arise, and that's what happens on this run. A wheel bearing overheats, which could cause an accident if not detected and addressed. To avert such problems, UP installed a series of infrared hotbox detectors along the rail bed. When the overheated axle passes this detector, the device notes the problem and broadcasts an audible announcement, alerting the train crew and the Harriman Dispatching Center about the situation.

A dispatcher determines where the train can pull into a siding, or a section of track off the mainline, to be inspected. She tells the crew to stop at that location. At the same time, the dispatcher sends staff from the mechanical department to inspect the bearing.

Depending on how severe the problem is, they might be able to fix the bearing on site, or they might need to transfer the affected car to a repair shop. In this instance, the repair crew performs an on-site repair. Once they complete that work, the dispatcher tells the train crew to get the train back on its way. Our container is now a few hours behind schedule, but it is moving toward Dallas once again.



Union Pacific serves all U.S. West Coast and Gulf ports. Its Pacific Southwest terminals include Oakland, Los Angeles, and Long Beach.

HOMEWARD BOUND

At 11:30 p.m. Thursday, the train arrives at UP's Dallas Intermodal Terminal, where it is positioned for unloading. Workers at the terminal (also known as a ramp) unload our container from the train and place it onto a chassis. At this point, the customer — the ocean carrier responsible for the door-to-door move — receives an EDI message stating that the container has arrived and is ready for pickup.

The ocean carrier dispatches a drayage company to the UP terminal to retrieve the container and deliver it to the retailer's DC. When the retailer finishes unloading, the trucker returns for the empty container and takes it to a container yard where the ocean carrier rents storage space. Having finished its trip, the container is now available for the ocean carrier to decide whether it will take on a new load for export or a domestic shipment or return empty.

This journey is based mainly on information provided by Mark Simon, assistant vice president-international intermodal, marketing, and sales at UP, headquartered in Omaha, Neb.

COME SAIL AWAY WITH ME

From Manic Monday to Friday Night, ports are awash with activity.

CMA CGM is floating on high. During the first half of 2015, the carrier increased freight volume 8.2 percent to 6.4 million TEUs.

The ocean shipping industry is awash with challenges as tepid freight volumes and overcapacity continue to erode revenues. Steamship lines are hyper-sensitive to shifts in demand. Consequently, many are idling vessels, reconfiguring service strings and port calls, and joining alliances to help rationalize capacity and better utilize assets.

Port efficiency and throughput is equally important. As the Panama Canal's grand re-opening nears, and larger containerships come online, carriers are further challenged with streamlining and expediting vessel discharge and loading at port. Time is money – especially as containerships approach 20,000 TEUs.

Marc Bourdon, North American president of French shipping line CMA CGM, the world's third-largest ocean freight carrier, offers a 24/7 behind-the-gate view of what happens when a container vessel arrives at port.

A containership's arrival at port generates a buzz of activity as stevedores and truck drivers gather enmasse to work the vessel. That said, most of the preparation occurs days in advance. Steamship lines often start planning five to 10 days out, depending on the origin of the last call, to ensure discharge and loading happen as seamlessly and efficiently as possible.

Among pre-arrival considerations:

■ **Pre-filing of Customs manifest:** Enables Customs to inspect manifest information prior to vessel arrival. This task is usually performed electronically.

■ **Preplanning of stowage and container yard prep:** Five days before a vessel arrives at port, CMA CGM opens up receiving of cargo. As containers come into the terminal for export, they are normally removed from trailers and stacked four to five feet high in the container yard. This reduces the space required to store them. Containers dwell in these stacks until loading begins.

Containers in pre-loaded stacks are reworked into proper sequence to avoid delays during loading to vessel. In this scenario, it's worth the cost of rebuilding and resequencing boxes to ensure the smoothest operation loading to the vessel. Each container going on the ship has a designated stowage location onboard, based on destination and weight. Having them arrive at the crane for loading at the proper time is critical to avoid re-handling or wasted time spent waiting for containers.

■ **Labor orders:** Vessel stevedores including line handlers, lashing gangs, crane operators, and working gangs have to be ordered from the union the day prior to vessel arrival in accordance with their Collective Bargaining Agreement.

■ **Ordering tugs and pilot:** Pilots are also notified one day prior to the vessel arrival. Timing is coordinated as the vessel comes closer to the port. The terminal also identifies and communicates exact berth. An email loop circulates among the steamship line, terminal, and vessel captain during transit, sharing mission-critical information.

WHERE THE ACTION IS

The arrival of a vessel at destination harbor or channel triggers a sequence of events. Consider, for example, this scenario: CMA CGM's 8,469-TEU *Dalila* reaches New York Harbor early in the morning for an expected 48-hour layover.

■ **4 am:** Onboarding pilot/vessel arrival at berth. Pilot boards the vessel just prior to entering the channel for approach into the port and works with the ship crew and tug boats to ensure a safe arrival to the container berth. Pilotage may require anywhere from one to four tugs depending on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CMA CGM continues to upgrade its services in fast-growing markets, and adapt its offering with the aim of unlocking growth potential and better meeting the needs of its customers. The United States is one of those growth markets.

the complexity of the maneuvering. The length of pilotage varies port to port. For example, it might take as long as eight hours in Baltimore because of its distance from the ocean. By contrast, Los Angeles/Long Beach is about one and a half hours.

■ **6 to 7 am:** Vessel arrives at dock. It takes about 30 minutes to one hour for longshoremen to secure the vessel dockside.

■ **7 am:** Customs inspections occur. U.S. government agencies—Customs, Coast Guard, Department of Agriculture—board the vessel to check all documentation, perform safety inspections, and look for any signs of pollution or contamination. At this time, laborers also arrive to begin unlashing containers on deck for discharge.

■ **8 am:** Vessel discharge begins. Longshoremen initiate the process of removing hatches and cycling containers to maximize productivity. Container stacking, sequencing, and staging prior to vessel arrival help increase efficiency. The longshoremen unsecure containers, discharge on-deck cargo, then remove hatch covers to reach under-deck cargo. Containers often are stacked four to five tiers high on deck, and eight to nine tiers below deck.Containers are unloaded and loaded simultaneously whenever possible to reduce the number of crane movements and speed the operation. Once the cargo operations below deck are complete, hatch covers are returned and more containers are stowed on top of the covers, then secured in place by the lashing gangs.

■ **11 am to 1 pm:** Lunch. During the two-hour window when longshoremen are required to take a one-hour break, a shore gang often replenishes ship stores.

TAKIN' CARE OF BUSINESS

During the *Dalila*'s stay at port, four gangs of longshoremen work the vessel 21 hours per day for two days – including mandated one-hour meal and leeway breaks.

Provisions are usually delivered shipside by truck using a small onboard crane to bring pallets up to the main deck. Bunker fuel is loaded from a barge on the off-shore side of the vessel while cargo operations are ongoing. Crews will take a taxi to local stores for personal shopping or dining while off ship.

Even before the *Dalila* arrives at Port Newark, plans are already in motion at its next port of call – Norfolk – to open receiving for cargo. All along the vessel's service string, a cascade of inputs and outputs impact forward planning and operations. Upon completion of loading at port, the vessel prepares for departure.

Once all cargo operations are complete, the tugs and pilot return to guide the vessel back out of the harbor. When reaching the end of the channel, the pilot departs with the tugs, and the vessel proceeds to the next port, where the entire process is repeated.

Meanwhile, at Port Newark, Customs clears and releases containers discharged from the *Dalila*. They then continue their onward movement to their final destination in North America. Some containers move by truck on shorter drays within the local area, while others move directly from the container yard onto specially constructed railroad cars bound for hinterland destinations.

A HARD DAY'S NIGHT

They should be sleeping like a log, but Penske Logistics is working like a dog through storms and shakeups to make sure shipments arrive on time.

BY FELECIA STRATTON

When you manage a complex supply chain, you learn to expect the unexpected, at any time of day or night. Variables from nasty weather to bad information can trigger breakdowns in customer service and manufacturing.

Companies that work with third-party logistics (3PL) partners get to share the pain when unexpected situations arise. While many manufacturing and retail companies don't have the bandwidth to handle catastrophic logistics breakdowns, 3PLs put forth a continuous effort to solve complex challenges.

In their arsenal, 3PLs pack experience and operational knowledge, extended transportation relationships cultivated over time that enable scalability and variability, and technology that customers might not necessarily have. This is their core business.

Underlying all the knowledge, expertise, and technology are the people behind the 3PL, and their determination to work 24/7 to solve any logistics or supply chain problem that arises for their customers.

Inbound Logistics got a firsthand look at such a 3PL, and met with many of the company's unsung heroes who rock around the clock until issues are solved, while offering their customers choices all along the way.

Based in Reading, Pa., Penske Logistics helps customers overcome logistics and supply chain challenges using a results-oriented approach. Penske often tailors supply chain services to a customer's unique operations, and production and market demands.

But sometimes those challenges are beyond anyone's control. Take the weather, for example. When a major weather event, such as a hurricane, is predicted, most people rush to the grocery store to stock up on bread and milk. Penske stocks up on detailed and well-coordinated contingency planning and transportation assets.

"When a bad storm is predicted, our first course of action is to develop a contingency plan based on who and what will be affected," explains Sunita Patel, senior manager of LLP operations for Penske Logistics. "We assess the risk up and down the supply chain for our customers. We identify their suppliers and manufacturing plants in the affected area, and determine who we need to communicate with during the storm."

Suppose, for example, that a storm is brewing in the Southeast, with 10 inches of rain and flooding predicted. "We geofence the suppliers in the affected area, marry that up against the route structure, and export the information to a master schedule," Patel says. "At that point, we bring internal and outside assets into the mix — the carrier management team, network design team, and load planners — at different levels and intensity."

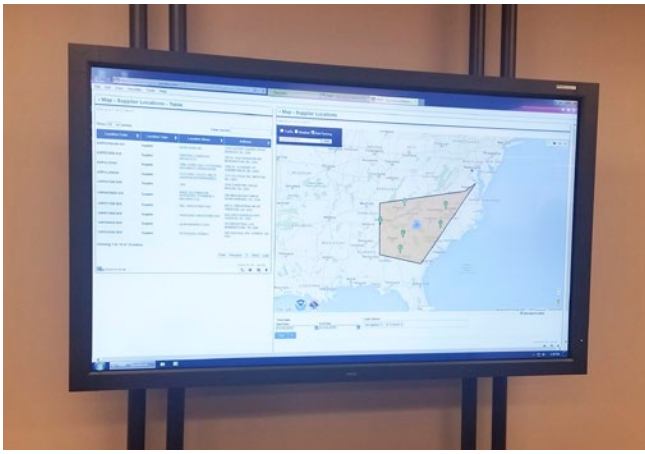
Most suppliers operate on a static ship schedule, so Penske knows each supplier's route and what day of the week it ships. After determining what day the storm will hit, or when the heaviest rain will occur, Penske pulls out the contingency routes for those days, and begins communicating that information to the customer.

After Penske pulls the material ahead, one of two things happen: The material arrives at the plant, or goes to a cross-dock earlier than expected. Because Penske and its partners work in concert to support the customer from this point forward, it's all about communication. Penske alerts the carriers to plan to make their pickups ahead of the storm, and then contacts the suppliers to let them know they have to pull ahead.

"And we don't just tell suppliers to pull ahead three days' worth of material," Patel says. "We give them specifics: Pull ahead your Wednesday/Friday route into Monday, or ship your Monday route, but also ship your Wednesday and Friday routes on Monday."

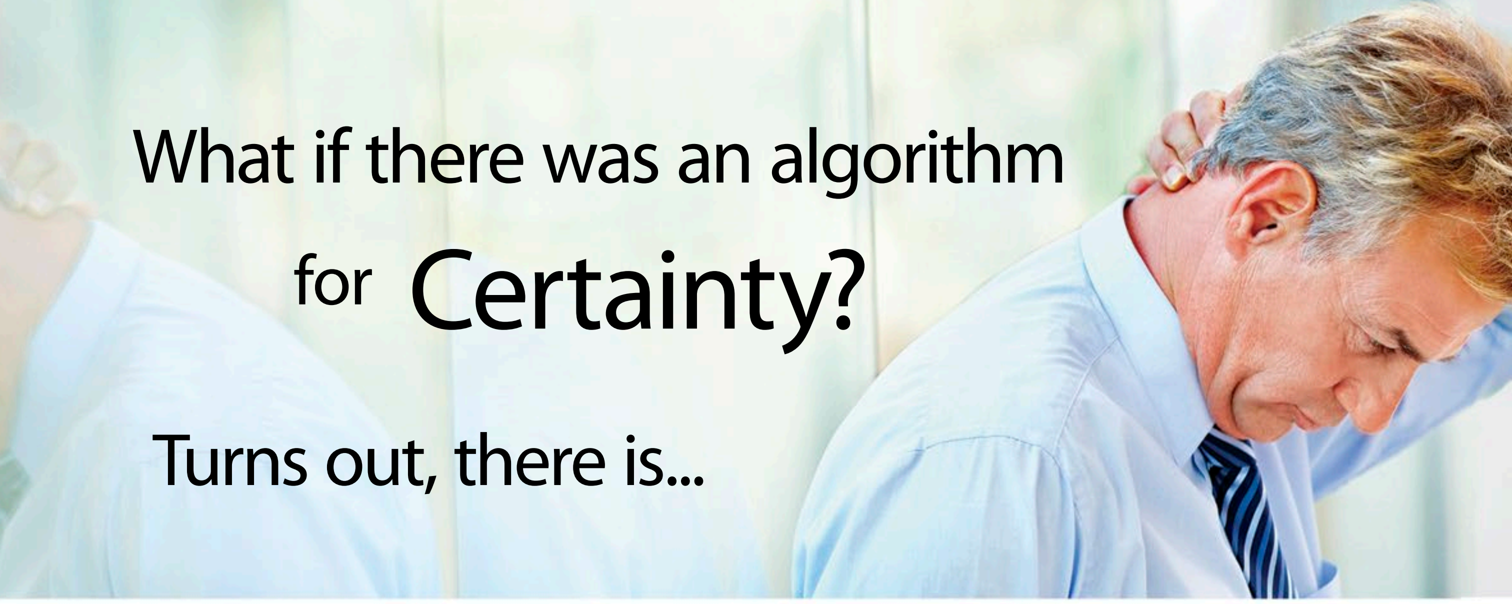
EVERYONE KNOWS IT'S WINDY

In late October 2015, Hurricane Patricia grew from a tropical storm to a Category 5 hurricane in just 24 hours. With maximum sustained winds of 200 mph, the storm mostly affected Central America, Mexico, and Texas.



Geofencing suppliers affected by an impending storm is an initial step in Penske's contingency planning.

Because the storm grew and moved so quickly, and conditions were constantly changing, Penske shifted into contingency planning mode around the clock. Continually reviewing progress with its customers, the tracking teams stayed on top of



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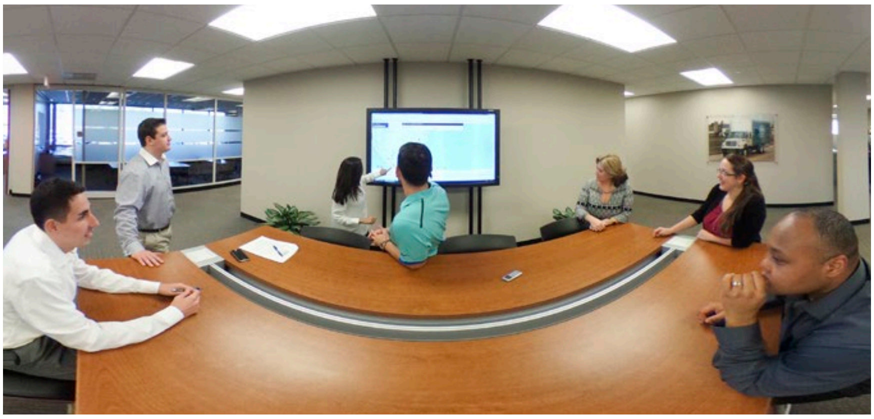
the pull-ahead shipments, plus the regular shipments, to make sure all customer deliveries were made on time.

"A separate part of our tracking team provided hourly updates on shipment location, status, and delivery time," adds Patel.

Hurricane Patricia was truly a 24/7 monitoring event. Penske's carrier management teams tracked the storm around the clock, and made regular calls to customers to ensure the contingency plan was working. Because of the team's extraordinary efforts, Hurricane Patricia ended up having only a minimal impact on customer supply chains.



During contingency planning meetings, tracking teams stay on top of both rerouted and regular shipments to make sure every customer's packages are delivered on time.

THE LONG AND WINDING ROAD

What happens during a longer-term weather event, such as Hurricane Katrina or Superstorm Sandy, where a huge portion of the United States is affected for more than just one day?

"For Hurricane Katrina, we did an exercise similar to Hurricane Patricia, but broke it up into smaller chunks and regions of areas impacted," Patel says.

Hurricane Katrina, one of the most destructive storms to ever strike the United States, moved ashore over southeast Louisiana and southern Mississippi in August 2005. Days, weeks, and even months after the hurricane struck, many facilities in the impacted regions suffered continued downtime; while other facilities were completely lost. Through it all, Penske stuck firmly and continually to its contingency plans.

"Penske was able to keep inventory flowing by establishing backup suppliers, moving equipment, and using our data warehouse to pull whatever additional information we needed to help customers make contingency decisions," says Patel. "Without our plan, some companies might have gone out of business, given the extensive damage and long recovery period."

When the unexpected supply chain meltdown happens, having a skilled logistics partner with the assets, bandwidth, experience, and on-demand access to an extensive network of transportation assets is gold. But it doesn't end there. Penske distills the experience and insight it gains from managing these events for its customers, and puts it into an operational knowledge base to help improve planning and reduce costs for the next time a weather disaster strikes.

> "Every single load that we receive is a big deal."
>
> – **Tony Bryant,** LLP Manager, Penske Logistics

EIGHT DAYS A WEEK

Supply chains don't operate on a 9-to-5, five-days-a-week schedule. Production lines run around the clock, and unexpected events happen at all hours. The integrated nature of logistics operations means a small anomaly, delay, or problem upstream will cascade downstream, causing exponential challenges or problems. Customers do not want to wait for a solution.

Given the increasingly rapid pace of retail and manufacturing operations, logistics and supply chain managers never truly clock out. They carry their smartphones and tablets with them, and are available around the clock until supply meets demand, no matter what time it is. Their 3PLs are in it for the duration, too.

Penske traditionally has partnered with its customers, and aligned its services with them to meet their needs. When customers began requesting 24-hour coverage, Penske established a Premium Freight team, a 24/7 operation.

"Our customers wanted to make sure that they're not just pushing buttons or waiting for somebody to call them back when they have a supply chain problem," says Tony Bryant, LLP manager, Penske Logistics. "Within this team, we have 24-hour coverage; that's weekends, that's holidays. If you call our center, you will talk to a live person. Somebody answers the phone and says, 'Hello, this is Penske.'"

Part of that 24/7 on-demand execution capability includes managing information, which never sleeps. Through discussions with customers, Penske found that they wanted more visibility into time-critical loads.

"Now as we bring in new customers, we're able to stabilize their process, look at their needs, and then manipulate that process to provide on-time delivery, and quick turnarounds," Bryant says. "With our group, most of the loads we receive are within six hours. So we need to pick those up quickly."

Not only does this division build relationships with customers, it also establishes partnerships with carriers. "We want to make sure that our core carriers are available when we need them," Bryant says.

"Every single load that we receive is a big deal," he says. "You can deliver 99 shipments on time and do everything right, but miss that one shipment and the customer will be upset."

The Premium Freight group currently handles several customers, each with their own distinct requirements. Some of the businesses are seasonal, and some are not, so Bryant's team sees a lot of fluctuation in loads coming through.

To enable around-the-clock tracking and provide shippers with visibility into their shipments, Penske developed an application called *Hot Board*. Team members input reminder times and match them against a mileage band that tells them when loads need to arrive, and what needs to be tracked next. The most recent shipment that should be tracked goes to the top. "Once we track it, it falls back in line, and we continue to track it until that shipment delivers," Bryant explains.

CALL ME

Because many logistics professionals run their operations from their phones after they leave the office, Bryant's team sends alerts out to some customers in a format that easily displays on their cellphone.

"They can see all the information at once — when the shipment was picked up, when delivery is expected," he says. "We also include information on the driver's location at that given time — city and state — and how many miles out to delivery."

When customers contact the Premium Freight group with a request, the first thing team members determine is how quickly they can get the shipment there — and give customers all the transportation options available — whether it's air, charter, ground, or other mode. "A lot of the decision comes down to delivery and cost," Bryant says. "Is the pain worth the price?"

Bryant's team doesn't wait for a shipment to develop into a problem; instead they track it incrementally across the process. Then they can take corrective action or offer the shipper alternatives.

"Shippers want options," Bryant says. "We give them every option we possibly can to get their shipments delivered. And, as that load goes in transit, we also monitor it

All the checks and balances Penske has in place allow them to catch issues quickly. "If we know a driver drove only 100 miles, and he was due to deliver within the next hour but he's farther out than we expected, we can contact the customer to let them know that their shipment will not deliver at 5:00; expect it to deliver at 7:00."

In some cases, customers are able to change the production line, and focus time

Penske Logistics tailors supply chain services to a customer's unique operations, production, and market demands.

using a six-step audit process. So when that update comes in, not only do we check to make sure that the mileage is correct, we also check back to the previous update to make sure the driver drove the specific amount of time.

"If we check a shipment that's on a four-hour schedule, for example, and the driver only went 100 miles in those four hours, we want to know what went on. Where is this driver? Why is this driver driving slow? It could be the driver took a break, or some other reason. But we need to know that so we can communicate it to the customer. When customers look at their updates, they want to know where the disparity is."

and assets somewhere else. They may be able to wait for their shipment without any downtime. Penske's information gives customers the flexibility to determine what to do, once they know that a load will be late.

The Premium Freight team deals with daily challenges such as a truck breaking down, or drivers hitting bad weather. They rely on a set of best practices to see how they successfully handled situations in the past.

"There are times where new things happen," Bryant says. "But a quick decision backing every action goes a long way. Sometimes, especially when dealing with an expedited shipment, we have only a

small window. We have to make a fast decision, and provide those options as quickly as possible to the customer."

IN THE MIDNIGHT HOUR

In 24/7 operations, sometimes the clock works for you, but sometimes it works against you.

Bryant recalls the time when a customer shipped a load LTL, then contacted Penske because they needed it expedited. The end user in Virginia was going to shut down if Penske couldn't redirect the shipment and get it there next day.

"First we contacted the LTL carrier and asked where this freight was," Bryant recalls. "They advised us the freight would be at their North Carolina terminal. So we scheduled a carrier in there without a problem."

However, when the carrier arrived, the North Carolina terminal advised that the shipment was not there. After some checking, Penske discovered that the freight never caught the outbound truck from the LTL carrier's Mississippi terminal. So, it canceled that load, and rescheduled a carrier to go to Mississippi.

This put a wrinkle in the expedite plan because Penske went from delivering this shipment in 4.5 hours to now delivering it to its destination in 12.5 hours. Penske gave the customer options — same-day air; charter; or ground transportation.

Once the customer made the decision, Penske contacted the terminal in Mississippi to advise they were sending a carrier for ground expedite. That's when Penske discovered that the shipment was finally loaded on an outbound truck going back to North Carolina. Unfortunately, it was sealed, and the trailer could not be opened.

"At that point, we decided we had to cancel that truck, and rebook it, now in North Carolina. We did get the track number for the LTL carrier," says Bryant. "We followed that truck to make sure it was going to deliver on time."

But when the driver that Penske booked arrived at the Charlotte location, again, the shipment wasn't there. Fortunately, inclement weather had delayed the LTL driver by only two hours. Penske was able to get the truck loaded quickly, and delivered the shipment about one hour after midnight.

"The customer did not have a line down situation, which was excellent," says Bryant. "But we did have to chase that freight around to locate it."

Bryant recalls another situation when a shipment was not as elusive; however, it posed its own challenges. Like the previous situation, a shipment that was originally slated for standard service needed to be expedited. Penske called the standard carrier to cancel this load because it had now become an expedite.

That's when Penske was notified that the standard carrier had already picked up the shipment, and the driver ran out his hours, so he went to a truck stop 10 miles down the road. Once the driver went on break, he couldn't move the trailer because of hours-of-service regulations. The regulatory clock started ticking.

"We started looking at some of our standard options: Did the carrier have a driver in the area? Could he just take the trailer back to the customer location?" Bryant says. "Nothing was available, so we asked the expedited carrier we secured if they would take the trailer. But they didn't want to, due to liability issues, which we understood."

Bryant and his team continued to spin their wheels, trying to figure out anything they possibly could do to get this shipment from the truck stop back to the customer without having to wait for the end of that driver's 10-hour break.

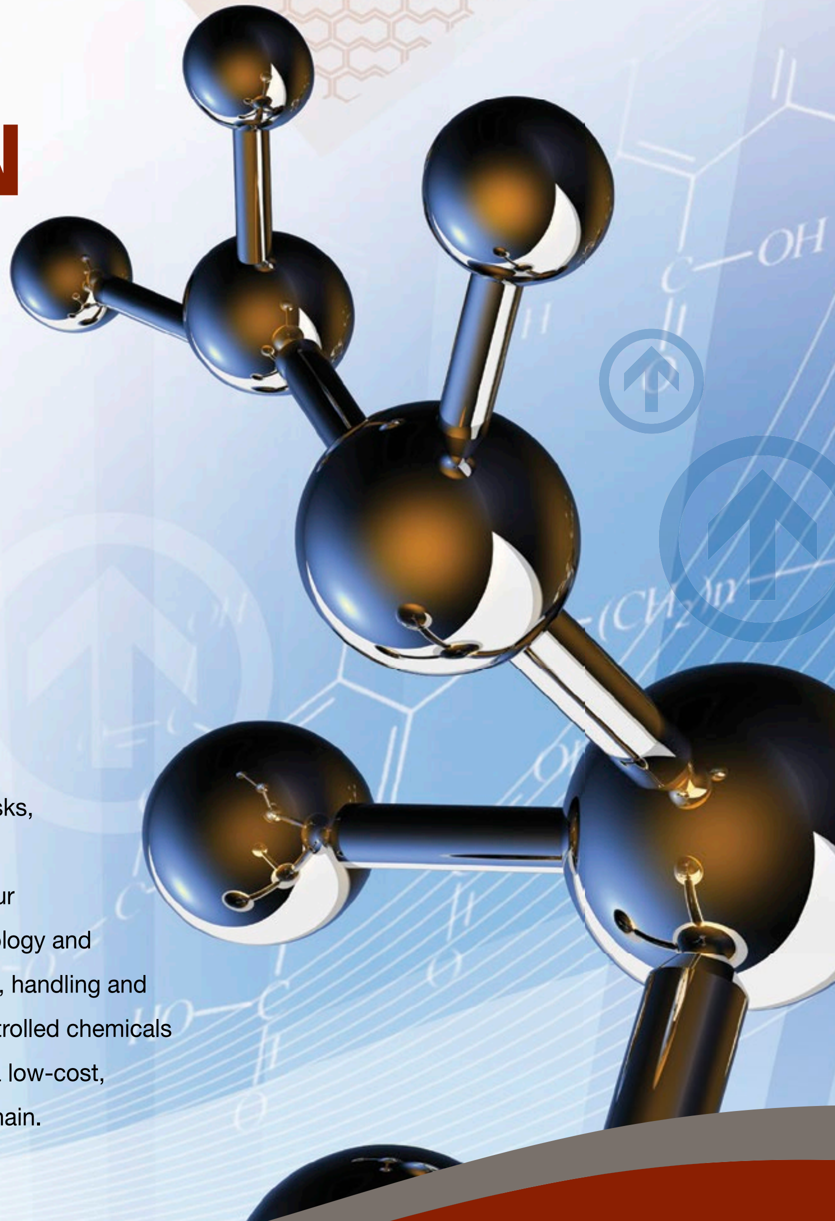
"Talking about grasping at straws; we finally found a tow truck that could come in and grab the trailer," Bryant says. "We breathed a sigh of relief."

But that wasn't the end of the story. The customer's plant was closing within the hour, and Bryant's team had to help them understand that this was a "hot load" for their end user. The customer ended up staying open long enough for Penske to get the truck towed back to the facility, where the shipment was offloaded, reloaded with the expedited carrier, and on its way.

"That was a tough one," Bryant admits. "We owned that problem for about eight straight hours."

In these examples, and countless others, Penske pulled out all the stops, and worked around the clock to serve its customer *and* its customer's customers.

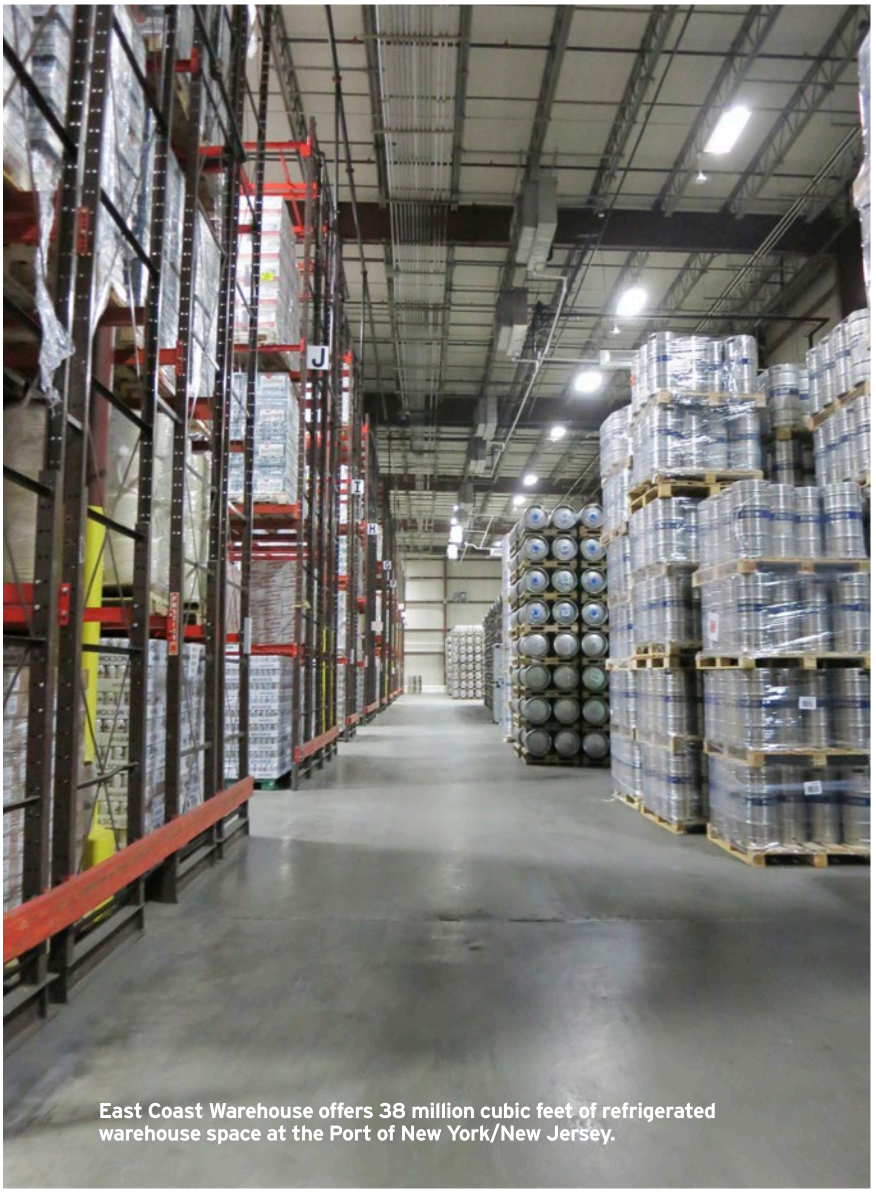
Penske Logistics keeps customers' supply chains in constant motion.



GIMME SHELTER

Port facility East Coast Warehouse is a Day Tripper, and doesn't take the easy way out, storing and distributing products even through terminal delays and Superstorm Sandy.

BY KATRINA ARABE



East Coast Warehouse offers 38 million cubic feet of refrigerated warehouse space at the Port of New York/New Jersey.

As a port-centric facility, operations at East Coast Warehouse & Distribution hinge on the terminals at the Port of New York/New Jersey. When things are running smoothly at the rail and marine terminals, the advantages of its location on the port come to the fore.

"Being on the port, we're able to pick up shippers' containers once they're available from the ship within 48 hours," says James Overley, CEO, East Coast Warehouse & Distribution. The company pulls approximately 40,000 containers from the Port of New York/New Jersey each year, according to its estimates.

Its massive facility—with more than one million square feet of space—houses finished goods, serving three vertical markets: beverage (including beer, wine, and water), food products (such as cheese, olives, and popcorn), and confectionery (from chocolates to hard candy).

The company estimates that it ships 11 million cases of beer and 13 million cases of candy annually.

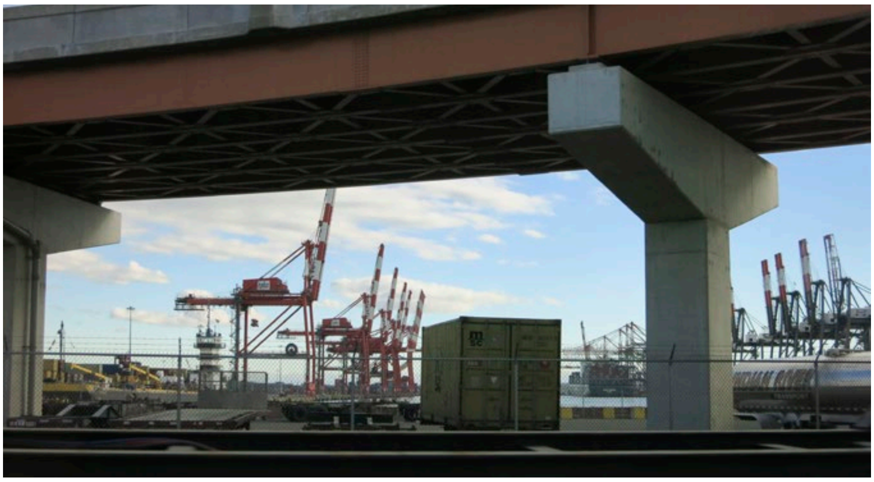
START ME UP

East Coast Warehouse's temperature-controlled facility functions as a crucial first step in importers' U.S. distribution systems. "About 90 percent of the product that's in our warehouse comes from another country," notes Overley. "When products arrive in a container on a ship, we dispatch a truck to pick it up, and bring it here, store it, distribute it, and move it to its final destination."

The food-grade facility sits on approximately 65 acres and is comprised of three warehouses certified organic by Oregon Tilth, a nonprofit certifier. With controlled temperature zones ranging from 40 degrees to 65 degrees Fahrenheit, East Coast Warehouse stores finished goods in both high-cube racked environments and double-deep and high-density storage systems.

Products in the warehouse come primarily from Europe, with a small percentage

An inventory management system allows importers to view all stages of container, inventory, and order status availability around the clock.



The facility's location in an overweight zone on the Port of New York/New Jersey translates into strategic advantages for food and beverage importers.

originating from South America.

The 21/5 operation starts at 8 a.m. and runs five days a week. Most container loading and unloading at the facility happens during the day shift (8 a.m. to 5 p.m.). To improve processing times for its supply chain partners, the facility employs an appointment-based pickup model, letting shippers plan down to the minute when products are ready to exit the warehouse. Truckers have appointments to come in and load containers throughout the day.

Let's say an East Coast Warehouse customer—a candy importer—has a trucker coming in to pick up a 52-foot drive-in trailer of gummy bears at a particular time during the day shift. East Coast Warehouse workers pick the order the night before and stage it by a door, so it's ready for the appointment the next morning.

"We assign the truck driver to that particular door. The product's already there," says Overley. "The driver backs in, we load up the truck, and away it goes."

To keep shipper supply chains humming, the facility's night shift focuses on getting ready for daytime pickup appointments. In addition to storage and handling, the facility offers co-packing, labeling, and multi-vendor consolidation to facilitate outbound orders, keeping products rolling through supply chains.

CARRY THAT WEIGHT

East Coast Warehouse deploys its own fleet to pick up containers from Monday to Friday from nearby marine and rail terminals.

The facility's location in a heavyweight zone is a huge advantage for importers of heavy, dense product. The legal weight for a container to go out on the New Jersey Turnpike cannot exceed 42,500 pounds, notes Richard Coppola, vice president of sales. If it does, importers are required to secure costly special overweight/heavyweight permits.

"Because we're on port property, our customers can max out as much weight in the containers as they want with no penalties and no added cost," notes Coppola.

Another advantage of its proximity to the New York/New Jersey port container terminals is the ability to redirect trucks when ports are congested. "If one terminal is backed up, we shift some of that capacity to another terminal that's not as congested," says Coppola. "We come back later in the day to the congested terminal."

Once truckers bring containers into its yard, the company's nine switchers take over. They are responsible for moving containers in the yard, and bringing them to the door to unload contents. A magnetic radio frequency identification (RFID) tag is affixed to each container to track its location utilizing RFID readers and GPS sensors mounted on spotter trucks.

The company recently launched the cloud-based yard management system from PINC Solutions. Through this technology, both employees and shippers have visibility into the status of containers—whether they are in transit, arrived at the facility, in the process of being unloaded, already unloaded, or have been emptied and checked out.

"We can pull this information up on an app, and see every container," says Overley. "We have visibility into every shipment in the yard. We have the yard mapped out into key locations from a GPS standpoint."

During the unloading process, warehouse workers pull pallets out with forklift trucks, and set them down at their location in the warehouse. Containers that are not palletized require unloaders. These workers take out the separate, stacked boxes, build a pallet up, and shrink wrap it before it is officially stored in the warehouse.

Workers electronically scan all SKUs arriving in the warehouse using RFID technology, which gives them visibility into pallet locations. This data automatically feeds into its inventory management system (SNAP), which customers can access through a web portal. The portal—part of

East Coast Warehouse's comprehensive WMS—allows importers to view all stages of container, inventory, and order status availability around the clock.

On average, warehouse inventory turns approximately eight times a year, notes Overley, meaning the average product stay in the warehouse hovers around 40 days. How long a product is housed in the warehouse varies by company and by item. For example, he estimates beer turns 11 to 12 times per year, while candy product inventory refreshes six times per year.

MOVIN' OUT

Products turn faster in high-demand seasons, such as summer for beer, and Easter, Halloween, and Christmas for candy. With shippers' just-in-time inventories hanging in the balance, East Coast Warehouse makes sure port terminal delays and other inclement conditions don't disrupt supply chains.

"We're the sole distributor for many Fortune 500 companies in either the Northeast or one of a few different distribution points throughout the United States," notes Overley.

Take one popular beer company, for example. Leading up to St. Patrick's Day 2015, port delays made the possibility of a stock-out imminent for the brewer during this crucial holiday. "The ports were totally upside down; there was complete gridlock," recalls Coppola. "It took drivers eight hours to recover a single box."

When it proved impossible to retrieve the customer's containers during the port terminals' Monday-to-Friday hours, East Coast Warehouse paid some of the terminals out of its own pocket to open on Saturday. It was able to pick up the containers in time to prevent the customer's supply from running dry.

Aside from warehousing and transportation, East Coast Warehouse counts customs clearance as another segment of its business. Its above-sea-level 14.5-acre exam and post-exam container service yard proved to be key during Superstorm Sandy in October 2012.

To optimize supply chain efficiencies, East Coast Warehouse provides value-added services, including co-packing, labeling, and multi-vendor consolidation.

An appointment-based system—where shippers book a time for products to exit the warehouse—facilitates processing at loading areas.

While nearby facilities sustained significant damage, its warehouses and yard stayed dry and had power even in the storm's aftermath. The company allowed both the Federal Emergency Management Agency and U.S. Customs & Border Protection to use its facility as an emergency command center.

In addition, nearby warehouses that were forced to shut down operations after the storm turned to East Coast Warehouse for help. The facility served as a surrogate site until the damaged warehouses were able to get back up and running, helping its competitors' customers keep supply chains in motion.

"All CFOs want to reduce inventories, match customer demand and production, and keep those in balance to reduce working capital levels," says Overley. The East Coast Warehouse facility helps them do just that, keeping supply chains running in a fast-paced JIT global market.

"It's amazing that a package of gummy worms made overseas can be here in three weeks by ship," says Overley. "Within five days after it's offloaded, it can be on a retailer's shelf." ■

The Automotive Aftermarket: Time *for a* Tuneup?

By diagnosing and responding to three service alerts – omni-channel retail migration, Mexican plant expansions, and the Trans-Pacific Partnership – automakers, parts suppliers, and 3PLs keep the aftermarket engine purring like a kitten.

BY CHRIS LEWIS

As the automotive aftermarket continues to evolve, automakers, auto parts suppliers, and third-party logistics (3PL) providers must react to the constant changes driving the industry's supply chain, from the widening of the Panama Canal to the migration of cargo from East to West Coast ports.

But, of all the changes that are currently transpiring, three recent developments—a shift to omni-channel retailing, an increase in manufacturing investment in Mexico, and the approval of the Trans-Pacific Partnership—are having an especially pronounced impact on automotive aftermarket supply chains.

In response, automakers, auto parts suppliers, and 3PLs are gearing up to navigate through these developments and help effectively streamline the automotive aftermarket supply chain in 2016 and beyond.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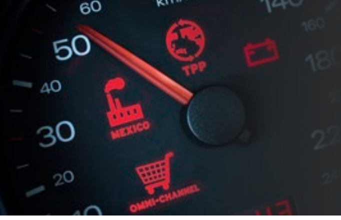
TPP
MEXICO
OMNI-CHANNEL



Omni-Channel Retailing: Consumers Change Lanes

Consumers are currently combining mobile, online, and in-store channels when shopping for auto parts, resulting in an omni-channel experience, according to UPS's 2015 *What's Driving the Automotive Parts Online Shopper* study.

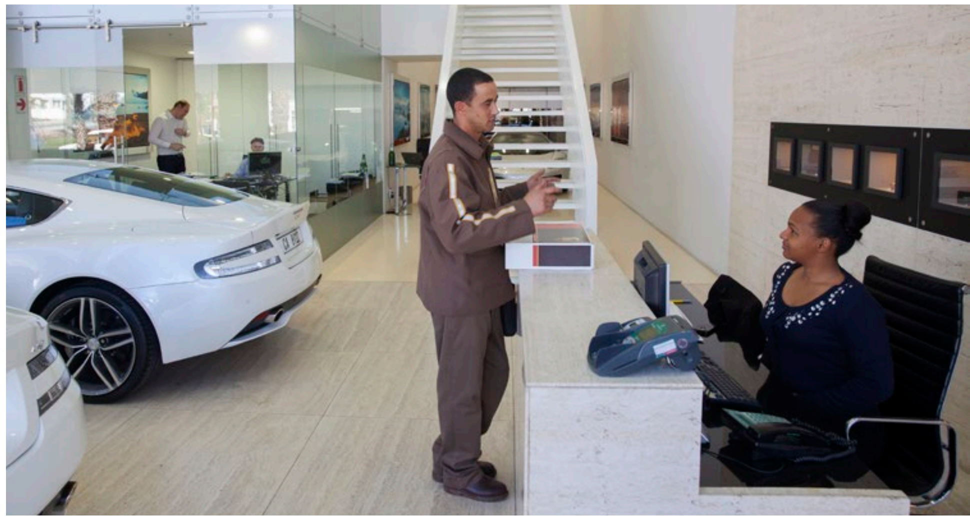
Of the online shoppers surveyed for the study, 56 percent have purchased parts online, a rise of 8 percent compared to 2014's study. And, 95 percent of surveyed shoppers compare prices before they purchase any items.

In addition to an increase in purchases, the UPS survey found that online shoppers interact differently with automotive aftermarket companies than they have in the past. They seamlessly move between their mobile phones, tablets, laptops, desktops, and physical stores to either purchase, research, pick up, or return merchandise.

"This shift is significant because many small and mid-size automotive aftermarket companies have linear supply chains for their online and physical store businesses," says Brian Littlefield, UPS's director of marketing for the automotive industry. "To successfully service consumers in an omni-channel environment, automotive aftermarket companies must integrate both the online and the physical store businesses into a single, seamless process."

To integrate their online and physical store businesses, and provide customers an omni-channel experience, most large companies have already reconfigured their supply chains. But small and mid-size companies are playing catch up, and investing in supply chain improvements to increase the likelihood of long-term success.

"It can be challenging for a small or mid-sized business to invest the time and budget in these capital improvements," Littlefield says. "But it's absolutely imperative that these investments are made. Just as general consumer retail has shifted to the omni-channel experience, the automotive aftermarket industry is also moving in that direction."



Dealers play a unique role in the automotive aftermarket supply chain. They have to manage both sides of the business: facilitating sales transactions, and supporting parts and service requests.

CHANGING LANES: SHIPPING PREFERENCES

From the rise of ship-to-store to a growing interest in alternate delivery options, auto parts consumers are increasingly open to having packages delivered to locations other than their homes.

2015 **2014**

Chose to have items shipped to a store

Chose to have items delivered to locations other than their homes

35% **have chosen ship-to-store to qualify for free shipping**

SOURCE: *2015 What's Driving the Automotive Parts Online Shopper Survey*, UPS

Seamlessly integrating online and physical store businesses typically begins by re-evaluating how the company monitors and maintains inventory levels for individual parts, as well as completed assemblies, whether they're across online marketplaces, high-volume wholesalers and retailers, or small-volume retailers.

All inventory levels at the assembly, warehouse, distribution, and retail segments of the supply chain often require greater visibility for sales, as well as returns. To improve their customers' omni-channel experiences, some automakers and automotive suppliers may need to increase their inventory levels as well.

"Because this is different from traditional distribution strategies, and requires a higher level of visibility, the integration of supply chains also requires a firm commitment from the highest level of management," Littlefield says.

UPS's study also reveals that online auto parts purchasers use ship-to-store 55 percent of the time, a 14-percent upturn compared to 2014's figures. So, while physical store locations are significant, a consistently reliable online presence is even more important.

If online purchasers cannot find their auto parts domestically, they will shop

| US Truckload | Canadian Truckload | Cross-Border Truckload | Refrigerated Truckload | Flatbed Truckload |
| Less-Than-Truckload | Intermodal | Expedited & Specialized | Freight Management |
KEEPING
YOUR BUSINESS
MOVING
FLS TRANSPORTATION
FLS US US TRUCKLOAD
FLS CN CANADIAN TRUCKLOAD
FLS XB CROSS BORDER TRUCKLOAD
FLS RF REFRIGERATED TRUCKLOAD
FLS FB FLATBED TRUCKLOAD
FLS LT LESS THAN TRUCKLOAD (LTL)
FLS IM INTERMODAL
FLS ES EXPEDITED & SPECIALIZED
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internationally as well. In fact, 29 percent of the study's respondents completed international purchases in 2015.

"Manufacturers, retailers, and distributors must become incredibly nimble to provide an even higher level of service," Littlefield explains. "Product availability is vital and should become even more important as barriers to trade are reduced through agreements such as the Trans-Pacific Partnership."

With this nimbleness in mind, aftermarket manufacturers must also be willing to ship their products the same day or within a few hours, as the omni-channel experience has resulted in "always on, always available" expectations.

"Manufacturers are faced with the struggle of balancing inventory with where—and how—it should be stored to serve customers quickly," says Brian Neuwirth, vice president of sales and marketing for UNEX Manufacturing Inc., an order picking solutions provider based in Lakewood Township, N.J. "They must increase their fulfillment speed to move the product out of the warehouse or distribution center and ship it to the end user as quickly as possible."

As a manufacturer and supplier of LED lights and lighting products, Madison, Ind.-based Grote Industries has experienced a decline in its distribution customers' inventory capacities; some are even asking Grote to maintain inventory and ship small orders within one or two days. Consequently, the company had to shorten its transit time.

"We have to monitor our shipments from beginning to end so we know exactly where they are—both inbound to us and outbound to our customers," says Debbie Sherman, logistics and transportation manager for Grote Industries. "It is essential that we know about transit disruptions or delays."

"The end-to-end knowledge of our products' physical location is crucial because customer expectations are increasing," adds John Grote, vice president of sales and marketing, Grote Industries. "We rely on logistics service providers to let customers know where their products are at all times, and when they will be delivered."

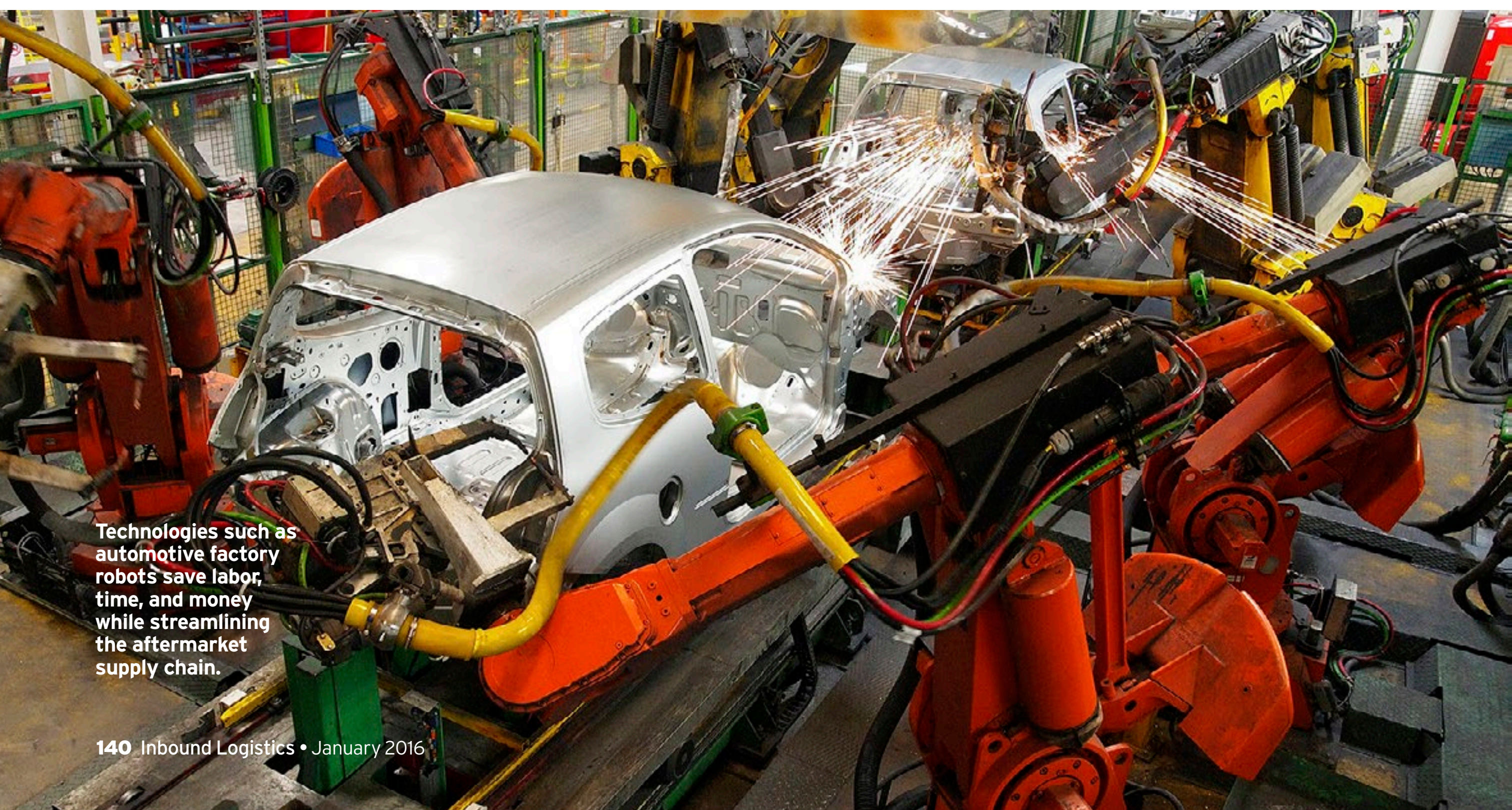
To meet customers' ever-increasing expectations, Spec-D Tuning, a City of Industry, Calif.-based online auto accessory provider specializing in headlights and taillights, offers customers same-day shipping if they complete their orders before 3 p.m. Pacific Time. The company has also established distribution centers on both coasts so that customers receive their items in two or three days.

"We offer free shipping, phone support, and online chat before customers purchase their accessories," says Jacky Lau, executive director of Spec-D Tuning. "We also provide detailed product descriptions, images of the products from different angles, and instructional videos so that customers can install the products themselves."

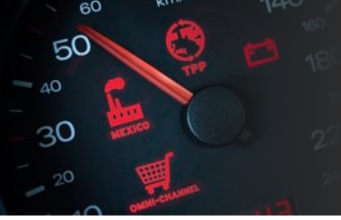
Mexico Shifts Into High Gear

In 2007, roughly 65 percent of all cars in the United States were built north of Ohio, according to Steve Rand, senior vice president, automotive of Hub Group, a freight transportation management company based in Downers Grove, Ill. By 2017, however, Rand expects that figure to decline to 30 percent as assembly locations continue to migrate out of Michigan and the Ohio Valley.

"The majority of plants are moving to the southeast United States—South Carolina (BMW), Alabama (Mercedes), Georgia (Kia), Mississippi (Toyota), and



Technologies such as automotive factory robots save labor, time, and money while streamlining the aftermarket supply chain.



The automotive industry's growth in Mexico provides Americas-based parts manufacturers the opportunity to expand globally.

Shipping to and from NAFTA markets can be complex, so many shippers turn to third-party logistics providers, such as Hub Group, to drive out cost wherever possible and ensure that automotive parts, such as these engine blocks, arrive intact and on time.

Tennessee (Nissan)—and most of those companies have plants in Mexico as well," he says. "This has significant implications for the supply chain as all the action is moving into the U.S. Southeast-to-Mexico corridor for Tier 1, Tier 2, and original equipment manufacturer (OEM) shippers."

As a result of Mexico's emergence as an automotive industry powerhouse, many companies now identify the ideal methods for moving products into and out of the market so they can successfully capitalize on the region's economic output and potential; $1.3 billion of goods currently cross the U.S.-Mexico border every day (roughly $1 million per minute), according to UPS's Littlefield.

Automakers and automotive parts suppliers that increase their cross-border shipping capacities should consider implementing integrated, contractual services that offer customs clearance and door-to-door visibility.

"Contractual, expedited cross-border services offer an affordable, fast, and reliable alternative to conventional ground or air freight," says Littlefield. "The ability to tighten delivery time, often by two to three days, and the efficiency associated with that, is tremendous. And logistics service providers have visibility into the entire supply chain, so automakers and auto parts suppliers know the location of all their parts at any given time, regardless of the service offering they choose."

Considering all these factors—with only one end-to-end solution provider and one point of contact—the services are a win-win for all supply chain partners, especially if they increase efficiency. Shortening delivery time by hours, or even days, produces bottom-line benefits.

Aside from an increase in cross-border shipping, the automotive industry's growth in Mexico also provides Americas-based parts manufacturers the opportunity to expand globally.

"Because of Mexico's geographic and economic standing, as well as its free trade agreements with so many countries, especially European nations, automotive parts manufacturers are well positioned to supply the global automotive industry," Littlefield adds.

TPP Removes Trade Roadblocks

After nearly 10 years of negotiations, on Oct. 5, 2015, an agreement was finally reached on the Trans-Pacific Partnership (TPP), the largest regional trade pact in history. Currently representing 12 countries, including the United States, Canada, and Mexico, the TPP is expected to connect 800 million consumers across the Americas and Asia-Pacific, accounting for approximately 40 percent of the global economy.

Not only will the TPP deepen the economic ties of each of the 12 participating countries, it will also have a considerable impact on the automotive aftermarket.

"As barriers to trade are reduced, automotive aftermarket companies and consumers in the countries involved with the TPP should have significantly more opportunities to conduct business together," Littlefield says.

In addition to an increase in market access, the TPP will reduce or eliminate 18,000 tariffs, expedite customs procedures, and support private companies that compete against government-owned facilities. It will also improve U.S. trade capabilities.

"More than 70 percent of the world's purchasing power—and more than 80 percent of anticipated growth in the world's purchasing power—is currently located outside the United States," says Littlefield. "The TPP will help level the playing field.

"As a result, many small and mid-sized businesses, including automotive aftermarket companies, will grow through exporting," he adds.


YESTERDAY,
YOU WERE
MOVING
GOODS.
Now
YOU'RE
MOVING
FORWARD.
Logistics used to be optimizing modes, aggregating shipments and managing carrier rates. Today, you've got to focus on customer service as much as capacity. Use advanced TMW software platforms for domestic transportation management to give you the agility, control, visibility and connectivity that will set your logistics operation apart. You'll get freight where it has to be and your company where you want it to be.
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Putting the Pedal to the Metal

As their services and product offerings continue to expand throughout the world, automakers and automotive parts suppliers of all sizes are considering utilizing various types of technologies, particularly 3D printing, carton flow racks, and event management visibility tools. These tools not only save time and money, but they also streamline the automotive aftermarket supply chain, thereby improving efficiency for the long term.

By reducing the time it takes to manufacture prototypes, for example, 3D printing can simplify the entire product development process.

"Depending on the number of design revisions a new product goes through, 3D printing can shave months of time and tens of thousands of dollars from the development schedule," says Littlefield. "And, best of all, automotive companies can upload their 3D print-ready files to 3D printing companies' websites and receive their parts as early as the next business morning."

Carton flow racks, such as those used in Johnson Controls' 125,000-square-foot plant in Suwanee, Ga. – where seats, door panels, and other interior parts are assembled for the Kia Sorento – help create flexible, modular, and portable storage.

In addition, UNEX Manufacturing's Neuwirth advises automakers and automotive parts suppliers to implement carton flow racks. While creating flexible, modular, and portable storage, the flow racks can increase space utilization by 50 percent—flexibility that is critical whenever companies encounter line and process changes.

"In the automotive industry, things can change at a moment's notice, as customers are always reconfiguring, adding new products, and updating standards. To keep up and stay competitive, plants must be flexible and efficient," Neuwirth says. "Carton flow racks help plants improve productivity and efficiency because production demand changes will not disrupt their business operations. Because the carton flow racks are easy to move and adjust, plants can respond to abrupt changes without hesitation."

To retain visibility of packages and shipments across multiple transportation modes, Grote Industries' Sherman also advises automakers and auto parts suppliers to use event management and visibility tools. By entering a shipment-related number into an event management and visibility website, companies can access all information related to international shipments that are transferred via air freight or ocean container.

"After entering their house bill or airway bill number on the website, shippers can view packing lists, the transit and delivery of any shipment, and even the release from U.S. Customs and Border Protection," she says. "The process is simple."

Material costs will steadily rise in the foreseeable future, according to Neuwirth. Omni-channel retailing also will continue to grow, thereby requiring manufacturers to reconfigure their distribution centers to speed fulfillment. And regulations will continue to affect the industry in some capacity.

The solution? Automotive aftermarket suppliers need state-of-the-art distribution centers equipped with technology that improves and speeds the order picking process.

John Grote agrees with Neuwirth, adding that the North American aftermarket needs to service customers better than direct sources overseas, or else it simply won't be able to compete.

"Information and speed will be critical for success in the future," he says. "Both those components differentiate us from the competition."

Furthermore, Littlefield advises automotive aftermarket suppliers to prepare for the future by implementing new, scalable supply chains, rather than adding solutions to existing platforms—another method of competitive differentiation.

"All too often, companies layer new or additional supply chain solutions onto their current platforms because it's the quickest and least expensive path to servicing their customers," he explains. "Eventually, companies spend more time managing their supply chains than they would if they had originally implemented a new solution. The earlier a company can design and implement a scalable supply chain the better, regardless of how quickly or how large they grow in the coming years." ■

Your 3PL Was Acquired. Now What?

Keeping Partnerships Strong in a Shifting Landscape

IN A 3PL MARKET DEFINED BY RAPID CONSOLIDATION AND GROWTH, SHIPPERS AND PROVIDERS ARE ENSURING SEAMLESS TRANSITIONS.

By Julie Newton

Among the trends that shaped the transportation landscape during 2015, the rapid pace of mergers and acquisitions in the third-party logistics (3PL) market was one of the most notable. XPO Logistics alone purchased four companies with varied capabilities in 2015, including Con-way, making XPO the second largest less-than-truckload carrier in the United States. Other significant mergers last year included C.H. Robinson's purchase of freightquote.com, the acquisition of Coyote Logistics by UPS, the FedEx purchase of GENCO, and the acquisition of OHL (Ozburn-Hessey Logistics) by GEODIS.

Some industry researchers expect the pace of 3PL mergers and acquisitions to remain brisk in 2016. During Armstrong & Associates' annual 3PL Value Creation Summit, industry executives indicated that consolidation within the 3PL market would continue, although they predicted that mid-sized and small acquisitions, rather than the $100-million-plus mergers that were completed in 2015, will dominate 2016.

Similarly, Dr. Robert Lieb, professor of supply chain management at Northwestern University's D'Amore-McKim School of Business, addressed the trend of mergers and acquisitions in the *22nd Annual Survey of Third-Party Logistics (3PL) Provider CEOs*, sponsored by Penske Logistics and presented at the Council of Supply Chain Management Professionals' conference in October 2015. The survey notes that consolidating firms need to weather significant industry restructuring, and navigate brand confusion in some markets.

Supporting Growth in Asia

Not all growth in the 3PL market will occur in North America, according to executives speaking at the Armstrong & Associates summit. These leaders anticipate significant growth in the 3PL market in Asia.

"Most Asia 3PL growth will occur to support intra-Asia trade and distribution within Asian countries," according to Armstrong. "Cross-border e-commerce is a hot market in China as increased wealth is driving the demand for products sourced in other countries."

Online shopping has also had an impact on North American-based 3PL companies, accounting for 12 percent of 3PL growth, according to one survey, which anticipates that the percentage will climb to nearly 21 percent in three years.

Why M&A?

Reasons for mergers and acquisitions are as varied as the 3PL providers involved. Some common reasons include growing pressure to expand services, increase geographic footprints, and drive scale in particular markets.

Because the 3PL market is highly fragmented, some consolidation is to be expected, according to industry analysts. "Consolidation in the 3PL industry generally facilitates scalability of operations in the merged organization, and should result in higher levels of service to the customer," says Dr. John Langley, professor at Penn State University and noted supply chain academician. "While there could be impacts on pricing, the overall market is sufficiently competitive that pricing should remain the same."

Not only is it important for shippers to choose the best 3PL to meet their needs, but they should also focus on being good customers, Langley notes.

"Perhaps the best strategy for the shipper is to continue to be a desirable customer for the new 3PL," he says. "One of the first steps in any merger and acquisition is that the new 3PL assesses the quality of the newly acquired customers and places the highest priority on retaining the best, most attractive customers.

"Unfortunately, the assumption that all customers of the acquired organization are worth retaining is usually not a good one, as the acquiring 3PL will typically conduct an in-depth analysis of all customers and make decisions accordingly," Langley adds.

Tactical Considerations

What do mergers in the 3PL sector mean for shippers? There will be no shortage of options for customers. For a shipper using a 3PL that has been acquired, however, some initial issues need to be addressed sooner rather than later. For instance, how will day-to-day operations or data transfer be impacted? Does the new provider have a level of expertise in a specific vertical?

Beyond these tactical questions, one key factor to consider is the relationship between the shipper and the acquired 3PL and how the acquisition will change this dynamic.

These issues were top of mind for Johnsonville Sausage when Ryder System acquired Total Logistic Control (TLC) in

After the acquisition, Ryder brought several benefits to TLC and its customers, including a list of established contacts and strong brand name recognition.

2011. Headquartered in Sheboygan Falls, Wis., Johnsonville employs 1,600 people. Its products, primarily sausages and sausage-related foods, are available in 50 states and 40 additional countries. When the acquisition occurred, Johnsonville had been a TLC customer for more than one decade. Ultimately, Johnsonville chose to maintain its relationship with Ryder, and is still a customer today.

"One reason we maintained the relationship was our long tenured, successful partnership with TLC," says Paul Kramer, director of logistics for Johnsonville Sausage. "TLC had always provided great service, and added value to the Johnsonville supply chain."

Business as Usual

Kramer was not concerned about the loss of specialized knowledge or expertise when Ryder acquired TLC. "We knew that TLC was being acquired by Ryder's food and beverage vertical service segment, and that service would continue to operate largely as it had," he says.

Before the acquisition, Johnsonville had a vehicle leasing relationship with Ryder, and was aware of the size and array of services the 3PL provided. "We were excited about the synergies and new opportunities the acquisition would create," adds Kramer.

Ryder provides commercial transportation logistics and supply chain management solutions. Ryder Fleet Management Solutions offers leased truck rentals and related services. Ryder Supply Chain Management Solutions manages the flow of goods from the acquisition of raw materials to the delivery of finished products. Ryder Dedicated provides solutions that combine vehicles, drivers, routing, and scheduling.

One reason Ryder acquired TLC was to expand its presence in the food and consumer packaged goods (CPG) market. "We have typically looked at acquisition opportunities from the perspective of adding a capability we did not have previously, or entering a strategic niche market," says Steve Sensing, president of Global Supply Chain Solutions, Ryder System.

"Our acquisition of TLC made it possible for Ryder to become a big player in the CPG market."

— **Steve Sensing,** President, Global Supply Chain Solutions, Ryder System

This aligns with Ryder's supply chain business model of focusing on specific vertical markets and developing expertise designed for each sector's specific supply chain needs. The firm focuses on these vertical markets: aerospace and defense, automotive, consumer goods, energy and utilities, food and beverage, healthcare, high-tech and electronics, oil and gas, industrial manufacturing, and retail.

"Before acquiring TLC, a majority of the work Ryder did for the food and beverage industry was truck leasing/rental and dedicated transportation," says Sensing. "The acquisition made it possible for Ryder to rapidly become a big player in the CPG market, as TLC was a leader in that space, offering specific capabilities, such as distribution management, contract packaging, solutions engineering, and temperature-controlled facilities, for CPG companies."

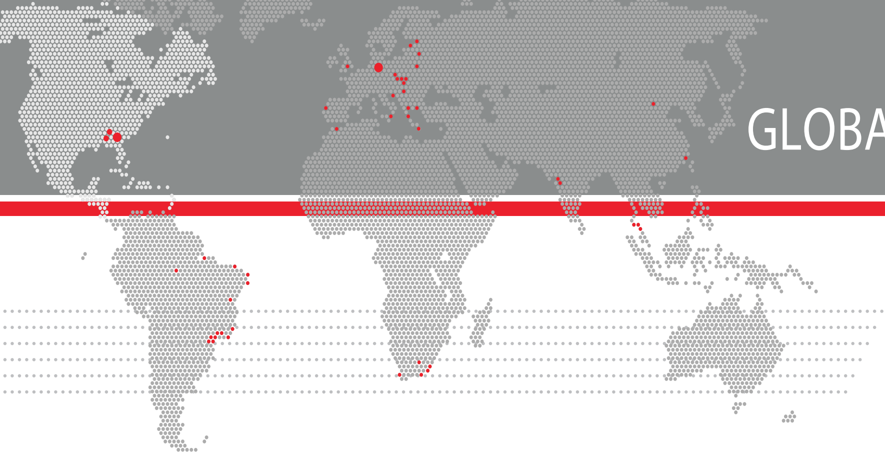
Ryder also brought a number of attributes to the table that benefitted TLC customers. "These included our contacts and name recognition, which enabled TLC to be more competitive than it was on its own," he adds.

"When Ryder acquired TLC, Johnsonville Sausage received several services including transactional transportation and public warehousing," says Sensing. "Today, Ryder operates Johnsonville Sausage's dedicated fleet in the Midwest."

That's Dedication

Ryder provides trucks, drivers, and engineering services for the fleet, which moves raw materials from the Chicago area to Johnsonville's production facility in

Sausage maker Johnsonville did not switch 3PLs after an acquisition. It relished the continued relationship with a long-term partner and the backing of a sizeable organization.



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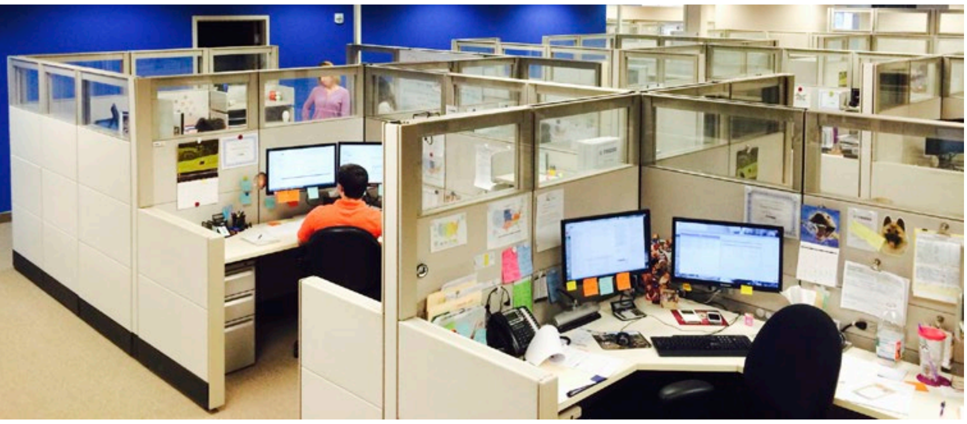

3PL provider TRIOSE chose to manage its growth organically, rather than through mergers and acquisitions.

Wisconsin. The fleet then transports finished products to Johnsonville Sausage's distribution center in Chicago, the largest in the company's network. The dedicated fleet includes 10 tractors and approximately 40 trailers.

In addition, Ryder operates a captive maintenance facility for the fleet on Johnsonville property, operated by Ryder employees. Before the acquisition, TLC operated the dedicated fleet and facility.

It's a Matter of Trust

For Johnsonville, the transition from being a TLC 3PL customer to being a Ryder 3PL customer was smooth. One of the greatest factors for the seamless transition was the relationship between Johnsonville and both TLC and Ryder.

"We trusted Ryder when they told us there would be no adverse impact on Johnsonville," says Kramer.

That trust has resulted in a positive experience for Johnsonville. From Ryder's perspective, the TLC acquisition has also proven beneficial, helping solidify its leadership and fueling 14-percent growth in the CPG market. The process was positive, as well.

"There is no silver bullet to make a transition like this successful," notes Kramer. "The best practice has to be employed long before the transition occurs. It starts with choosing the right logistics service partner in the first place, one with a company culture that is closely aligned to yours and with a proven track record of service excellence.

"Once you select a provider, you then work to establish a trusting, collaborative relationship with them," he adds. "If you have that, and the logistics partner stays true to who they are through the acquisition and transition, it will be successful."

"We did not want to let growth impact our ability to deliver for our customers."

— **Ira Tauber,** President, TRIOSE

Ryder is committed to making all transitions seamless to customers, Sensing notes. In addition to the tangible assets of a company being viewed as a potential candidate for acquisition, cultural fit is also important.

Organic Growth

Not all 3PL providers choose to grow through acquisition. For some, such as niche provider TRIOSE, growth has been totally organic. Based in Pennsylvania, TRIOSE was established in 1999 and focuses exclusively on the healthcare industry. In addition to a variety of services, TRIOSE offers customized solutions designed to help supply chain and materials management teams gain control and visibility over inbound and outbound freight expenses, from small parcel to large cargo.

"We have been methodical in our approach to growth," says Ira Tauber, president of TRIOSE. "We did not want to let growth impact our ability to deliver for our customers."

TRIOSE provides customized solutions to an industry with unique supply chain requirements. For example, one hospital may have 6,000 to 7,000 suppliers, and between 50,000 and 90,000 SKUs. In contrast, an automobile manufacturer may have a supplier base of 200 to 1,000 vendors, and manage anywhere from 2,000 to 5,000 SKUs when manufacturing a car. Additionally, the healthcare expertise is distinctive.

"In healthcare, product accountability is critical," says Tauber, including chain of custody in some instances.

TRIOSE added value early in its relationship with Rockford Health System by developing consistent processes for purchasing, using, and measuring freight transportation costs. "Freight was something that just happened and was not


ICE

monitored," says Chip Geiger, purchasing manager for Rockford.

Rockford Health System, located in Rockford, Ill., is the largest health system serving northern Illinois and southern Wisconsin. It includes a 396-bed tertiary care hospital; numerous clinics with locations throughout the region; a 55-bed in-patient hospital offering a full range of rehabilitation services; and a visiting nurses' association providing a variety of home healthcare services to patients of all ages.

The health system selected TRIOSE as its 3PL provider following a complete review of its supply chain process, conducted with the help of an external consultant. Implementing a freight management program was among the 53 cost-saving measures TRIOSE identified.

An Education in Freight

"One big challenge for Rockford was the need to educate its health system workers and executive leadership on how freight impacts the bottom line," says Tauber. "Rockford management needed to find a way to bridge its finance and accounts payable personnel with its purchasing staff to better manage all costs."

While TRIOSE provides freight management services to many healthcare providers, one area of customization is reporting and access to data. Recognizing that each hospital or healthcare system is unique is one reason that the TRIOSE implementation program with Rockford was smooth and seamless.

"We used few internal resources, and implemented the program quickly," says Geiger. Rockford saw measurable results within the first month. The first year produced $51,886 in savings as the system ran 43 percent of its freight spend through TRIOSE. Rockford currently has 70 percent of its freight spend through TRIOSE.

"By implementing the program, we brought a new and more comprehensive focus to freight," says Geiger. "Instead of a necessary evil that no one wanted to address, we were able to install a consistent monitoring program that everyone from our receiving dock to accounts payable departments understands."

"Low prices do not necessarily equal low cost."

— **Chip Geiger,** Purchasing Manager, Rockford Health System

Rockford has been a TRIOSE customer for more than seven years, and after the initial onboarding with TRIOSE, "we never looked back," says Geiger. Although some larger supply chain firms have healthcare vertical teams, Geiger does not always believe that bigger is better. "Low prices do not necessarily equal low cost," he notes.

Life or Death Situations

Rockford and other healthcare providers deal with patients in operating rooms that need specialized products. When lives are at risk, a late or missed delivery is not just an exception on a report, but a potentially catastrophic event. Geiger counts on TRIOSE to establish and monitor carrier relationships and ensure that service levels are acceptable. If there is a problem, rather than making many calls, Geiger has only one call to place—to TRIOSE.

Rockford has been pleased with the level of customer service TRIOSE provides, and the ability to customize reports and other data needed to manage its supply chain. The company is also impressed with TRIOSE's in-depth understanding of both freight management and the healthcare industry.

"I go to TRIOSE with my goals, and they develop a program that meets my needs," says Geiger. "I do not have to be an expert on freight standards." At times, TRIOSE provides services that eliminate the need for Rockford to hire two full-time equivalent employees, he adds.

Consolidation in the 3PL industry is not a surprise, Geiger says, and merger and acquisition activity in healthcare is also on the rise. And, much like the healthcare industry, it is important that companies that grow through acquisition not only leverage their expanded scale, but also deliver high levels of customer service.

The Freedom of Choice

As the 3PL industry continues to evolve, shippers will have many choices. For non-asset-based providers, the cost of entry into the market is relatively small, notes Satish Jindel, founder of SJ Consulting Group. He does not find the recent flurry of acquisitions as surprising or as something that is likely to limit options for shippers.

Shippers choose to contract with 3PL providers for many reasons: to focus on core competencies, reduce overall transportation or logistics costs, or to better manage inventory. As shippers evaluate existing, merged, or new 3PL providers, they should also be aware of their own processes and approach to vendor relationships and choose partners that best align with their strategies and needs. ■


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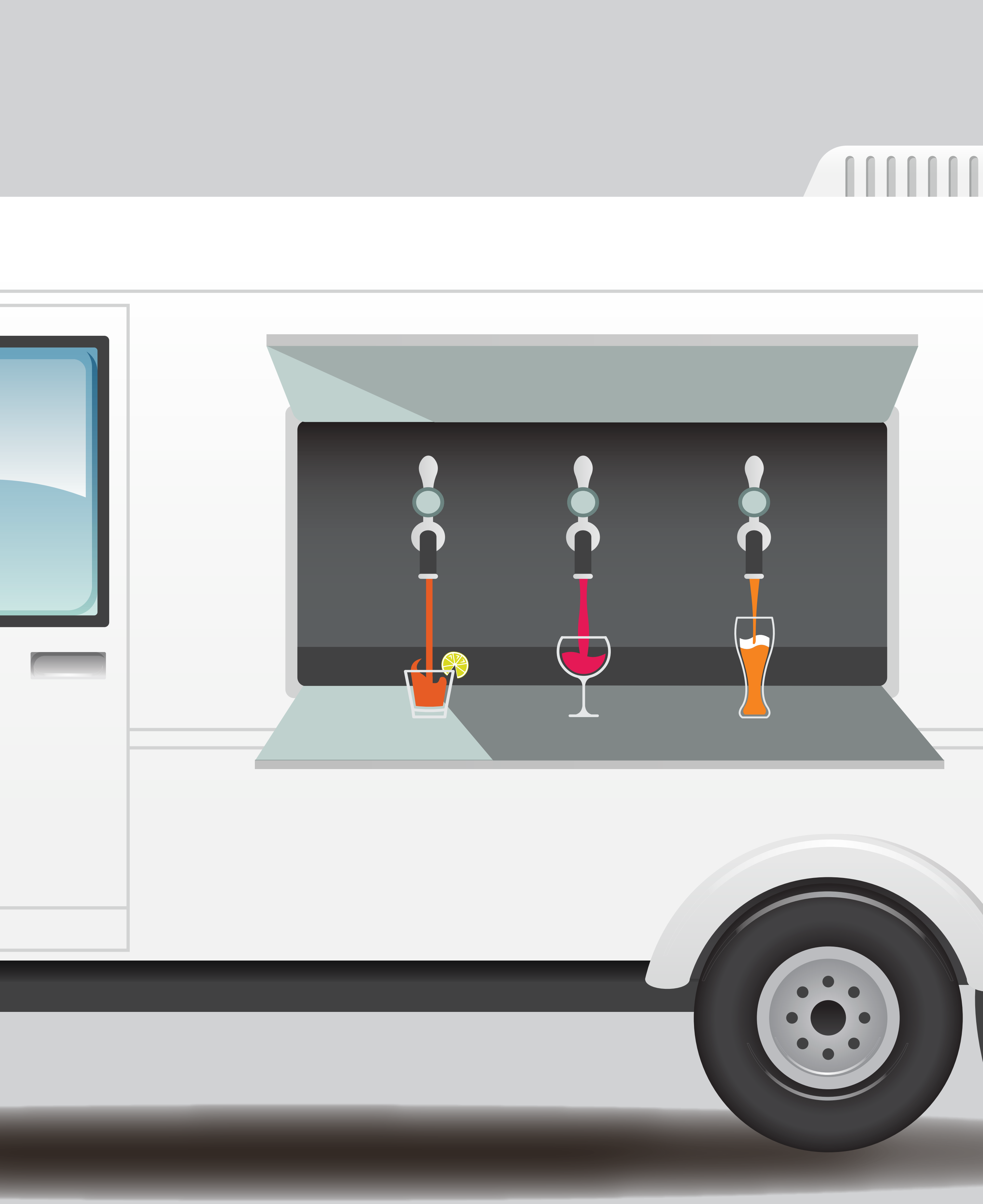
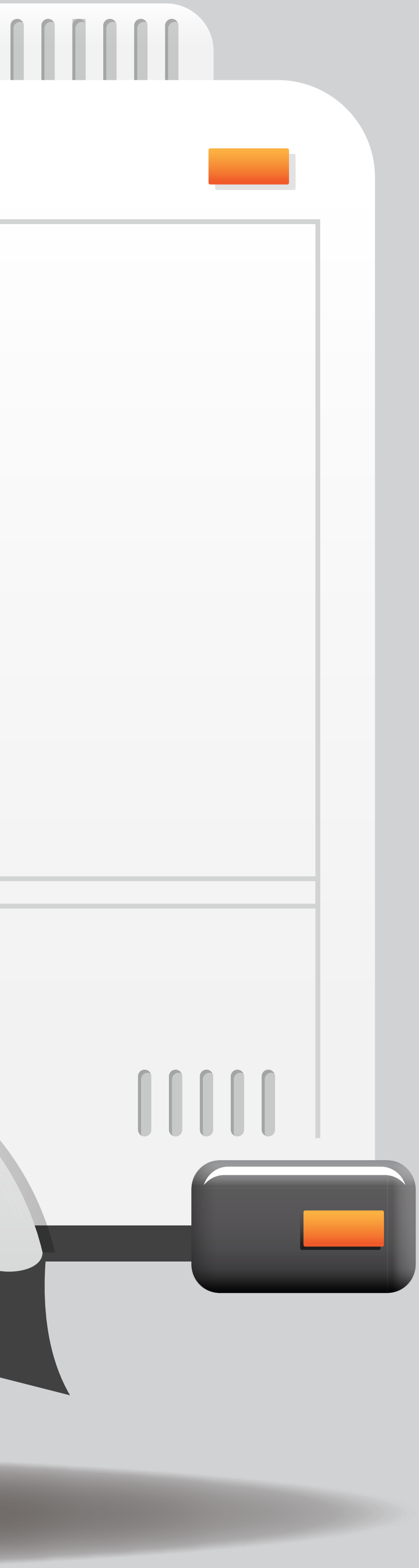




LIQUOR LOGISTICS: Solutions ON TAP

To keep customers in good spirits, beverage companies need their liquor to move quicker. Here's how they keep the drinks flowing.

By Karen M. Kroll

Although wine, beer, and spirits often signal fun and festivities, achieving success in the U.S. liquor market is a serious challenge. The number of products continues to proliferate. Suppliers, distributors, and retailers must comply with myriad regulations, many of which vary by state. One key: a supply chain that offers visibility, facilitates collaboration, leverages technology, and allows sophisticated data analysis. A daunting order, but some companies are bellying up to the bar.

That's critical, given the exponentially increasing number of stock-keeping units, or SKUs, one result of the booming number of breweries, distilleries, and wineries. Over the past decade, the number of craft distilleries jumped from about 80 to 800, reports the American Craft Spirits Association.

The number of breweries hit 3,464 in 2014, according to the Brewers Association, and each offers its own products. In the late 1990s, in contrast, most warehouses stocked about 150 unique products. "It used to be 'stack 'em high and let 'em fly,'" says David Christman, senior director for state and industry affairs, the National Beer Wholesalers Association. This is no longer the case.

Beverage distributor Glazer's is well-positioned to deliver new brands as they continue to emerge in the marketplace.

The wine industry has enjoyed similar growth. More than 10,000 wineries and wine warehouses now dot the United States, up from about 2,900 in 2000, according to the Wine Institute.

These changes add several levels of supply chain complexity. New SKUs lack sales history, which limits the ability to forecast demand, says John Spain, executive vice president and senior partner with Tompkins International, a supply chain consulting and implementation firm. In addition, the volume of SKUs means customers have more choices, and some choose less popular items. That has led to more bottle, rather than case, picking. While it's hard to quantify the increase, Spain notes some distribution centers now pick more bottles than cases.

In contrast to the explosion in the number of products, the industry has seen consolidation among many wholesalers and distributors. "Thirty years ago, there were a lot of wholesalers," says Paul Laman, vice president of W&H Systems Inc., a materials handling systems integrator. "Today, the top 10 wholesalers conduct 80 to 90 percent of the business. They may have 10 to 12 states each. That reflects a massive change in distribution."

For instance, Glazer's Inc., a wine, spirits, and malt beverage distributor, currently operates in 15 states, up from four in the mid-1990s, says Dave Christensen, the company's vice president of supply chain. The growth has come both organically and through acquisition, he adds.

A SHOT OF E-COMMERCE

Another emerging trend is the increase in websites and apps that allow consumers to order liquor online or through their mobile devices, and then have their purchases filled and delivered from liquor stores nearby. These apps provide e-commerce capabilities for liquor purchases, yet work within the myriad regulations that currently prohibit many producers and distributors from shipping directly to consumers.

One aspect of the industry that hasn't changed is the three-tier system, a holdover from the prohibition days. The liquor supply chain consists of three distinct entities: suppliers, or the wineries, distilleries, and breweries that create the beverages; the distributors; and the retailers. "In general, companies have to be either a producer, distributor, or retailer," Spain says.

What's more, every state has a set of rules and regulations, and each party in the supply chain must comply. Even when distributors operate across state lines, they typically incorporate in every state where they do business.

The system was designed both to control alcohol sales and to allow various government units to tax them. On a practical level, it makes the supply chain even more complicated. "It's almost like dealing with 50 countries," Spain says.

SPIRITED COLLABORATION

A critical element to boosting efficiency and effectiveness in the liquor supply chain is collaboration. "As distributors, we're trying to build better bridges to our suppliers," says Christensen.

While this has always been a focus, in the past two years, Glazer's has added several more strategic vendors and enhanced its existing relationships. Typically, Glazer's chooses vendors based on a range of factors, including size, supply chain capabilities, and potential opportunity.

Glazer's doesn't overlook suppliers as potential partners just because they lack sophisticated technology. "You don't need fancy systems to build relationships," Christensen notes. Just as important, he says, is a willingness to invest the time and resources necessary to build productive partnerships.

Indeed, a first step in developing a partnership often consists of sharing data. Glazer's might provide depletion and

The booming liquor business has added several layers of complexity to the supply chain with the proliferation of many new product SKUs.

out-of-stock forecasts, and ask the supplier for information on its inventory levels.

Next, the two firms often establish processes for communication. This can be as simple as scheduling monthly or weekly calls to discuss, for instance, planning, forecasting, and replenishment and to review key performance indicators, such as inventory levels and turns.

With some vendors, the goal is to move to vendor-managed inventory (VMI). Glazer's provides inventory and depletion information, which the suppliers can use to more efficiently manage their production, inventory, and shipping operations.

"Vendor-managed inventory smooths out and stabilizes the process so vendors get a cleaner signal, and we get the benefit of the vendor doing some of the day-to-day processing," Christensen says.

America's independent beer distributors are a critical link in a three-tier distribution system, which includes brewers and importers, distributors, and retailers.

The improved communication and trust between the firms often enhances several performance measures. With one partner, Glazer's' forecast accuracy rose 10 percent, inventory levels fell by nearly 15 percent, and fill rates to customers improved, Christensen says.

Third-party logistics providers can also benefit from working collaboratively with suppliers. "One advantage of working together is that suppliers can see what's happening at the local level, and how well a product performs," says Scott Walter, a distribution center manager with Kane is Able, a provider of third-party logistics, warehousing, and transportation services.

Fill 'er Up...With Brewtroleum?

By Robert Gordon

A senior logistician once told me if I could understand all the logistics that go into producing a single bottle of beer, I could understand the logistics of any product.

Beers that follow Germany's purity laws can contain only water, hops, barley, and yeast. All these natural ingredients must move from where they are grown to the brewery. The inbound logistics of these items must be done with care to preserve the ingredients for use in the finished product, which must then be distributed via complex logistics.

Beer and other alcohols are highly regulated and taxed. National and international guidelines, laws, and rules for distribution must be followed to move the product locally, regionally, nationally, or internationally.

The farther the beer has to travel, the more complex the transportation and taxation requirements. Beer moves globally because of marketing, prestige, traditions, price, and appeal.

Beer not only involves logistics; it is impacted by reverse logistics as well.

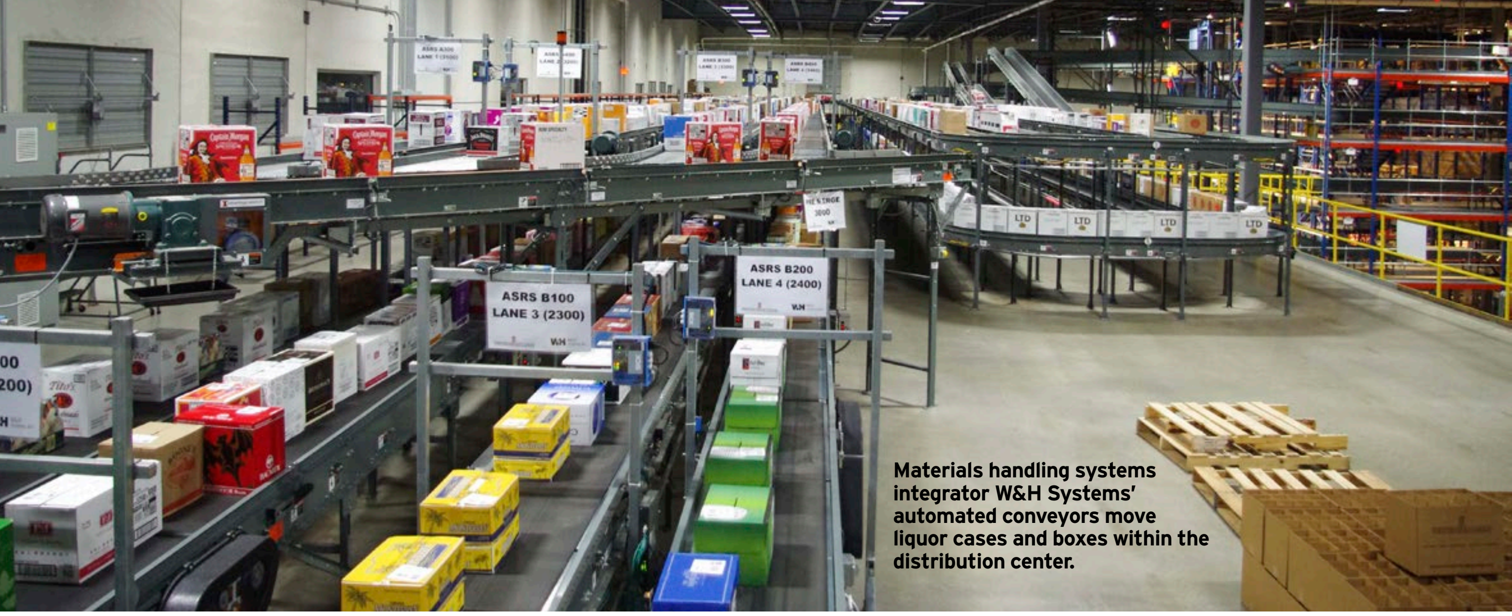
Ethanol has become a common additive to gasoline. Many critics feel, however, that ethanol is not practical. As demand grows for corn-based ethanol, the price of corn will increase, making it more expensive as a food product. When oil was more than $100 a barrel, corn ethanol seemed like a viable approach because it made a lot of economic sense. Now that oil is less than $50 a barrel, corn does not make much sense as an alternative fuel source.

Barley, hops, water, and yeast are the only ingredients allowed in the production of German beer.

Here is where the reverse logistics of beer comes in. In the process of making beer, the mash of yeasts and other products is removed as a waste product. This material is good for fertilizer and other applications. However, this waste product can be used to produce ethanol. Given that this waste product is not otherwise useful, it makes more sense to turn it into an additive to gasoline.

Beer drinkers in New Zealand love this idea and have created Brewtroleum. Several gasoline stations are specifically using this beer by-product as an additive to gasoline. Time will tell if this application catches on in other beer-drinking nations. Who knows, maybe some day we will see Brewtroleum being transported around the world the same way nations today move around oil.

Robert Gordon is program director of reverse logistics management at American Public University.



Materials handling systems integrator W&H Systems' automated conveyors move liquor cases and boxes within the distribution center.

"When we work collaboratively, we see an uptick in productivity."

"Along with communication and collaboration, technology is becoming a bigger part of the industry," Christensen says. The solutions available today can streamline operations and improve decision-making.

Technology is also one solution to the challenge of attracting strong employees. "It's difficult to find labor," Spain notes, particularly during the hectic holiday season. Automation can reduce the need to hire more people.

In 2014, Glazer's finished implementing SAP for several functions, including operations and purchasing. It also uses JDA Software for planning and forecasting. The company has reaped multiple benefits – including improvements in the type of data it can share, and the complexity and SKU count it can manage – from leveraging these systems for supplier collaboration.

For example, with one supplier, Glazer's pulls information from both systems to drive Collaborative Planning, Forecasting and Replenishment (CPFR). The goal is to fully automate the CPFR process by 2016, Christensen says.

TAPPING INTO TECHNOLOGY

Along with facilitating the electronic exchange of information, technology streamlines the ways liquor physically moves through warehouses and onto loading docks and trucks, before landing on store shelves. For instance, although wave-based picking systems have been around since the 1990s, they've advanced in the past five years. The older algorithms focused largely on the efficiency of pickers, while the newer ones take both pickers and drivers into account.

In addition, advanced merge-combine technology, such as W&H Systems' Shiraz Warehouse Control System, allows multiple feeds to run and blend simultaneously without colliding. "It's like a traffic intersection with a four-way stop," says Laman.

The upshot? Most older systems could handle about 4,000 cases per hour. By using an advanced combiner and new software, that jumps to between 6,000 and 9,000 cases per hour for most wines and spirits.

At the same time, building density has increased from about 2.5 cases per square foot to four to six cases per square foot. This is due to taller buildings, automatic storage and retrieval crane systems, and more efficient use of space.

Radio frequency (RF) technology is also streamlining the liquor supply chain. "Utilizing RF allows for more efficient and accurate checks against purchase orders, as well as shipping order accuracy," says Mike Kelly, distribution center manager for Kane is Able. Using RF technology when loading and receiving cases, rather than relying on paper documentation, increases receiving capability by 30 to 50 percent, he adds.

In addition, pallet utilization has increased from about 92 to 95 percent 10 years ago to 98 to 102 percent today. Several factors are behind the jump, including greater use of pallet optimization software, and stronger, yet thinner, packaging.

One technology that promises to become more cost-justifiable over the next several years is robotic grippers, Laman says. W&H's advanced multi-case gripper,

Consumers Drink It All In

Another shift in the liquor market that's poised to impact the supply chain is the growing demand by consumers to know the pedigrees of the products they're purchasing—that is, where they were produced and what ingredients they're made of.

Satisfying this demand requires producers and distributors to track distinct items from origin to store shelves. "Consumers want a connection with the product," says Angela Fernandez, vice president of retail grocery and foodservice with GS1 U.S., which is part of global organization GS1, which manages barcode standards. The Global Trade Item Number found under each barcode uniquely identifies products.

The use of GS1 standards provides consumers more product information. "Trading partners are leveraging the common language that standards provide to trace products and ensure information transparency throughout the supply chain," Fernandez says. The use of Global Location Numbers identifies the manufacturing plant where a product was produced.

"It turns data into a strategic asset," Fernandez says. "It opens a door for sharing information with consumers so they can make informed decisions."

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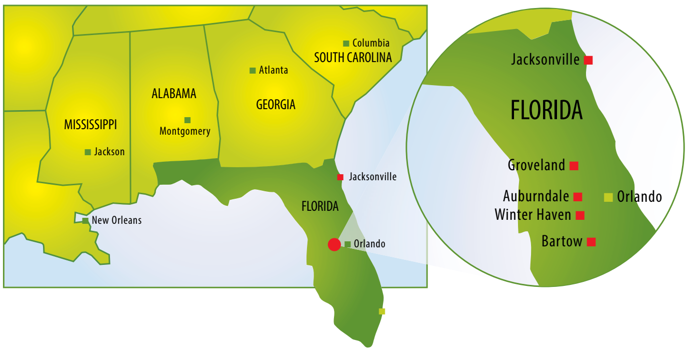

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estimated to deploy by 2017, will provide boosts in efficiency, he adds.

Few small producers can afford sophisticated enterprise and warehouse management solutions. Instead, they often manage by sheer will, says Jackson Bilbrey, product manager with HighJump, a Minneapolis-based provider of supply chain management solutions. Small businesses typically rely on an unwieldy mix of manual processes and spreadsheets.

"Small companies know how to make great beer, but not how to run a business," says Ross Elliott, executive vice president and chief strategy officer of HighJump. The company's recently released suite of solutions for craft breweries, *Brewers' Edge*, includes functions such as order fulfillment, beer club memberships, and product delivery. The applications are available by subscription, eliminating the need for a large capital outlay.

A small number of companies use technology to address the last leg of the liquor supply chain — getting products from retailers to consumers. One example is Saucey, an app that launched in May 2014, and currently serves customers in several California cities and Chicago, with more locations to come.

HOT SAUCEY

Here's how it works: Customers peruse an online menu and select the items they want. Saucey's technology identifies the store that can fill the order most efficiently, and routes the order and accompanying payment there, says Chris Vaughn, founder and chief executive officer of Saucey.

Retailers working with Saucey pay a fee that varies with the volume of business they capture through the application, among other factors. In return, they gain additional sales, and have access to tools developed by Saucey that help with functions such as inventory management.

Once the order is placed, Saucey dispatches a courier to pick up and deliver it — typically in about 30 minutes. The couriers also check and scan customers' identification with each purchase.

The company uses its own stable of independent couriers, rather than asking its retail partners to handle this function. The reason? "We can track and manage the delivery process and ensure speedy delivery," Vaughn says.

This boosts customer satisfaction and allows Saucey to maximize couriers' efficiency, Vaughn says. Couriers can pick up multiple purchases at once, and Saucey's software identifies the most efficient route to deliver them.

As the liquor supply chain continues to grow more complex, beverage suppliers, distributors, and retailers will tap into technology, data, and collaboration to keep the happy in happy hour.

Cheers! ■


PITT OHIO

A New Rx for Pharma COLD Chains

Pharmaceutical supply chains are adjusting to meet the demands of fast-changing biologics medicine.

BY LISA HARRINGTON

Ensuring product integrity and security throughout the supply chain has always been a high priority for pharmaceutical manufacturers. In the past few years, however, executing this mission has grown far more challenging. New market dynamics—including a changing product portfolio, stricter regulations, geographically extended supply chains, increasing risk, and intense cost pressure—have significantly raised the stakes.

The challenge at the heart of this new business paradigm is the fact that drug-makers today face an exponential growth in the need for temperature-assured distribution and handling of materials, from active ingredients to finished products. This requirement stems from a dramatic change in the nature of pharmaceutical and biotechnology products.

Specifically, drug portfolios are evolving away from reliance on small molecule/chemical pharmaceuticals and toward more structurally complex biotechnology drugs, which have much stricter temperature requirements. In addition, new regulations in the United States, the European Union, and elsewhere, have dramatically expanded the list of drugs that require temperature-controlled handling—in particular, stipulating new rules for handling products that fall into the controlled ambient (15 to 25C) category.

The stakes in this new pharma world order are high. "Gaps and breakdowns in good distribution practices can trigger a chain of dire consequences for manufacturers—from increased regulatory scrutiny and steep financial penalties to slumping sales, a surge in shareholder apprehension, an irreversibly damaged brand and reputation, and worst of all, compromised patient safety," say Jamie T. Hintlian and Ryan Kelly of consulting firm EY in their report *A Roadmap for Risky Territory*.

Additionally, the growing practice of healthcare providers and payers (insurance companies and governments) basing purchasing and reimbursement decisions on a drug's therapeutic performance means it is critical that manufacturers protect product efficacy throughout the supply chain.

In the face of these realities, manufacturers have gone back to the drawing board to re-think their temperature-controlled supply chains.

THE BIOLOGICS BOOM

While the growth in drug spending worldwide is healthy in aggregate, the rise in spending on biologics and specialty drugs is far more dramatic. In the United States, for example, expenditures for these new specialty drugs are expected to significantly increase between now and 2020 (*see Figure 1*). This same trend is playing out across the world, as the transition toward more structurally complex and temperature-sensitive drugs gathers momentum.

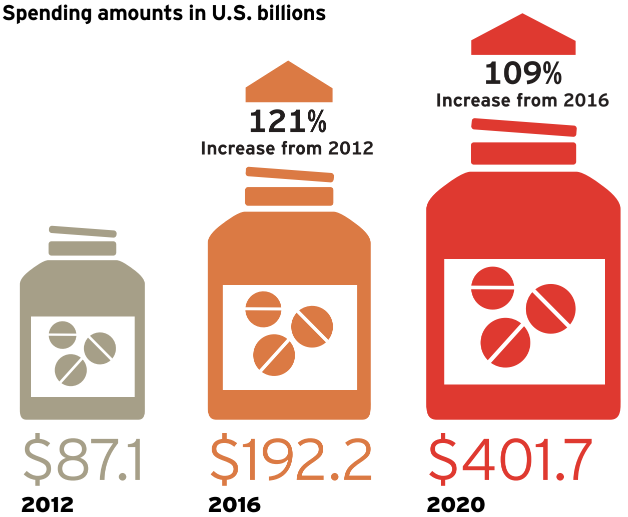
The industry's migration to these new medicines injects tremendous complexity into the supply chain. For example:

- Product must be handled within specific condition tolerances—i.e., cold chain, controlled room temperature (CRT), and frozen (*see Figure 2*). Failure to maintain appropriate conditions at any point in the supply chain can harm the efficacy of the drug, result in the loss of a shipment, and put patients at risk.
- Biotechnology medicines often are extremely high value. Annual per-patient treatment costs can exceed $100,000. This means a single consignment may be worth upwards of $50 million.
- Because drugs are manufactured in specialized locations, these temperature-controlled products frequently traverse the world on their way to market. They move through a sometimes extreme range of climactic zones while en route, and travel via multiple modes with numerous hand-offs.

"It all boils down to one simple fact," says Jay McHarg, president of American Aerogel, a manufacturer of temperature-controlled packaging solutions based in Rochester, N.Y. "There are far more temperature-sensitive products on the market today than there were even three years ago. In biopharma, 80 percent of the top products introduced in the past two or three years are temperature sensitive."

Figure 1: Projected Specialty Drug Spending 2012 to 2020

Spending amounts in U.S. billions



U.S. expenditures for new specialty drugs are expected to substantially increase by 2020. A similar trend is playing out across the world.

Source: PwC Health Research Institute estimates based on data from CVS Caremark, 2014

Global distribution of these perishable products increases risk. And in emerging markets, infrastructure issues—lack of proper temperature-controlled facilities, transport options, and handling capabilities, as well as higher ambient and container temperatures—come into play.

"All of this means product protection—preventing damage and/or spoilage—is high on the pharmaceutical company agenda," reports Jonathan Blamey, vice president, Global Solution Design, DHL Life Sciences & Healthcare.

Not surprisingly, expenditures for cold chain logistics are climbing. The total size of the healthcare cold chain logistics services market is expected to grow from $8.5 billion to nearly $13.4 billion by 2020, according to IMARC Group's *Global Healthcare Cold Chain Logistics Market Report & Forecast (2016-2020)*.

THE COMPLIANCE SQUEEZE

As the nature of pharmaceutical products is changing, so are the global regulatory regimes that control them. Pressure is increasing to ensure "ship-to-label" regulations are met. Authorities require proof that products have not only been stored at the temperature stated on the label, but also kept within an approved temperature range during transportation.

This stepped-up regulation is largely the result of revised guidelines the European Commission issued in 2013, which established good distribution practices (GDP) requirements for pharmaceutical products. These rules are fast becoming the de-facto standard around the world.

In addition to extending enforcement to include transportation as well as storage, the European Union GDP rules greatly expanded compliance oversight to include medicines not previously covered by temperature-control regulations. The GDP rules do not specify exact procedures. Instead, they focus on a risk-based approach to managing condition outcomes in adherence to label requirements. This makes compliance a challenge.

"There's a lot of interpretation about what to do and how the enforcement will affect us," says one European pharmaceutical manufacturer. "Authorities are not telling pharma companies anything until they do an inspection; they have to figure out the answers."

Expanding compliance requirements, particularly to CRT products, is straining supply chain operations as well as budgets. "Right now, everyone's costs are going up," reports the director of specialty and cold chain logistics at one major U.S. drug-maker. This fuels the urgency of developing a more cost-effective temperature-controlled life sciences supply chain.

As companies adapt to this new product and regulatory environment, temperature-controlled supply chains must incorporate

> "You need to understand your risks before you put product into the supply chain."
>
> – **Perry MacDonald,** Warehouse and Export Manager, Pfizer Global Supply Hospira

ways of mitigating risk and loss, have strong contingency capability, and deliver proactive problem-resolution processes. And they must be segmented based on tiered product value, handling needs, customer service requirements, and compliance rules.

Beyond this, emerging best-in-class life sciences cold chains are adopting the following four key strategies.

1. A specialized and compliant network. The unique requirements of cold chain pharmaceuticals demand a highly specialized and compliant network tuned to moving product efficiently, while protecting its integrity. This network consists of the facilities and assets required to handle temperature-controlled cold chain pharmaceuticals, as well as the IT systems needed to monitor and manage global product flows.

An intelligent IT platform underpins the physical network. Monitoring solutions establish visibility checkpoints that enable more proactive control of the shipment, and allow for intervention should an adverse situation arise. Because the IT platform houses the manufacturer's standard operating procedures (SOPs), these interventions conform to regulatory and company requirements.

On a strategic level, intelligent IT networks harness the power of big data and analytics to reduce risk and make better decisions about managing the temperature-controlled supply chain. "Because we have collected, aggregated, and analyzed data from multiple customers, thousands of shipments, hundreds of trade lanes, and numerous types of packaging, we can identify risk trends and design the supply chain process to prevent, avoid, or mitigate those risks," explains David Bang, global head, DHL Temperature Management Solutions.

Assets and IT provide the physical network to manage goods, but the people, and their expert knowledge of handling pharmaceutical products, make the network work. "First and foremost," says the U.S. pharma company's cold chain director, "we expect people to understand that what they are handling is not just a carton of nuts and bolts. A life may depend on it."

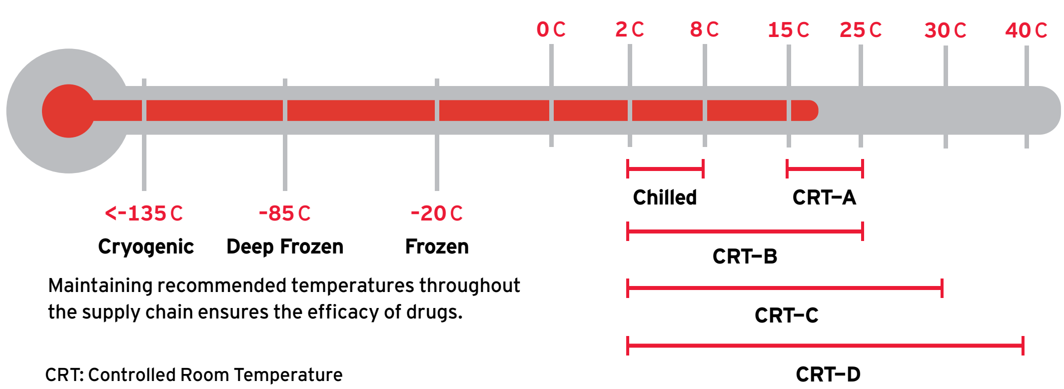
This means training is a top priority. "We have trained more than 3,000 employees on GDP as part of our ongoing program," reports Nigel Wing, vice president, global head, DHL Life Sciences & Healthcare. "It's not enough for us to have a best-in-class cold chain infrastructure; we must constantly invest in the people that work within it."

2. Globally consistent processes. Effective temperature-controlled supply chains rely on well-defined SOPs to make them work. The foundation for these SOPs is comprehensive supply chain risk assessment. SOPs address the product characteristics, season, weather conditions, in-transit and in-storage condition requirements, documentation needs, in-transit monitoring, and compliance.

"You need to understand your risks before you put product into the supply chain," explains Perry MacDonald, warehouse and export manager for Pfizer Global Supply Hospira. "Conduct risk assessments collaboratively with your partners, and build policies and procedures around those risk findings. These include mitigating actions — what happens to my product if the aircraft is delayed or breaks down? They also include lessons learned from past incidents."

MacDonald asks his third-party logistics (3PL) providers to develop their own risk assessment of his products and lanes. He and the 3PL then blend that assessment with Hospira's procedures to arrive at mutually agreed-upon SOPs.

Figure 2: Common Product Temperature Ranges Within a Controlled Supply Chain



Source: DHL Global Forwarding, 2015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"This collaborative approach is important, especially if you're making a change in your supply chain," MacDonald insists. "The greater the risk in the supply chain, the tighter the collaboration on SOPs between the manufacturer and the forwarder needs to be."

Kevin Tuel, senior manager of global sourcing at CSL Behring wholeheartedly agrees with MacDonald's assessment. CSL Behring manufactures plasma protein bio therapeutics, which are used to treat conditions such as hemophilia, immune deficiencies, sepsis, and shock. Every one of its products is temperature controlled (frozen), moving around the world between production and plasma collection facilities in Switzerland, Germany, the United States, and Australia.

Tuel worked closely with the company's global freight forwarder to develop SOPs for every shipping lane in this complex supply chain. As he explains, these lane SOPs must be filed with and approved by the regulatory authorities in Europe and the United States.

"This is a complex process," he acknowledges. "We had to agree on every detail. At first, we wanted to control the trucking portions of the shipment lanes ourselves, but because of liability and risk issues, we finally decided to let our forwarder provide the complete door-to-door solution and control the moves end-to-end."

For global pharma companies, SOPs are a constant work in progress. "We are always fine-tuning our SOPs to optimize and improve the way we handle our flows," notes Aurelien Sarazin, distribution manager-EMEA APAC, for Bristol-Myers Squibb Co.

3. Risk-appropriate packaging. The third essential of a smarter temperature-controlled supply chain is packaging. In principle, shippers of temperature-controlled pharmaceuticals have a broad choice of options. Essentially, packaging falls into two basic categories: active and passive.

Active systems range from discrete packages and full containers/trailers to entire aircraft. They use an energy source combined with thermostatic control to maintain temperature. Passive packaging solutions look like conventional packages but use materials such as water/ice or dry ice to keep products at the desired temperature. Unlike active solutions, passive packaging does not respond actively to adverse temperature conditions.

The choice of packaging is a matter of balancing cost with the risks and benefits of a particular option. When making their selection, manufacturers must consider the value of the pharmaceutical product, its temperature-management needs, regulatory compliance requirements, customer and market risk, and total cost. "The analysis is based on a single question: How much risk are you willing to assume?" says Joachim Kuhn, CEO of thermal packaging company va-Q-tec.

Fortunately for the drug companies, stricter temperature control regulations have sparked a new wave of innovation in packaging technology. "Six or seven years ago, choices were limited," says McHarg. "Only two or three companies made temperature sensing/monitoring devices, for example. They were expensive and cumbersome."

Today, however, new technologies can monitor temperature and report back a real-time stream of condition information—all at a far more affordable price point.

CSL Behring sees the benefits of these new technologies firsthand. "We had been using temperature monitors in our containers," Tuel recalls, "but would find out about a temperature excursion only after the container arrived, was opened, and temperature data was downloaded. That's too late.

"We need to see a problem while the shipment is in transit, so we can do something to save it," he adds. "A pallet load of our product can be worth more than $1 million, so we can't afford to lose it. Losing a clinical trial shipment due to a temperature excursion can set back the launch date of a new drug by months. That's costly."

To tackle this issue, Tuel recently started working with Verizon on remote monitoring of CSL Behring's ocean containers in transit—with good results.

These new technologies, and the regulations that spawned them, have helped the entire pharma supply chain get better at protecting product integrity. But while packaging — even the most expensive

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active solutions — protects the product, it isn't the complete answer. "Even the most robust packaging material is no good if the handling is poor," says Wing of DHL. "It takes people to make the cold chain work, so it comes back to having good SOPs, knowledge about the product, and constant training."

4. Total cost strategy. Smarter cost management is the fourth essential of the next-generation life sciences cold chain. "The whole industry — our customers and all partners along the supply chain — are on a journey together to drive down total costs," Wing says. Leading manufacturers and their logistics partners are evolving away from simply managing costs on a purchase-price basis, to a total cost of ownership (TCO) model.

Strictly defined, TCO is the compilation of direct and indirect costs associated with a purchase, transaction, or activity. In the case of the temperature-controlled pharmaceuticals supply chain, TCO carries a much broader definition to include everything from patient safety to product and market share losses to brand risk.

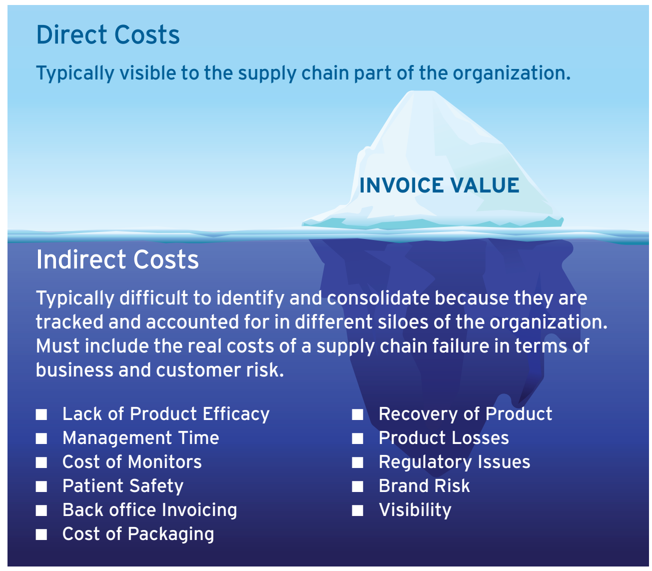
One way of thinking about TCO is to view it as an iceberg (*see Figure 3*). Direct costs, such as the invoice value of a service, represent only a fraction of the whole cost picture. The hidden costs — patient safety, product loss, new product launch delays — carry the real risk to the business.

Identifying and calculating these hidden costs, and factoring them into a business decision or operating plan, is not easy. "Within large pharma organizations, costs often are spread across various departments, further hindering a strategic approach to cost management," says Angelos Orfanos, president, DHL Life Sciences & Healthcare. "A damaged or lost product is one cost line, the cost of packaging is in a different line, transportation is in yet another line, and so on."

Economizing on one aspect of the temperature-controlled supply chain without factoring in the total cost can and often does backfire. Valgeir Pétursson, managing director of Malta Principle Trading Company/Pharmapack & International Logistics at Allergan, offers an example. "If a logistics manager sends a shipment of five pallets on a dedicated truck, let's say that costs approximately $4,300. If he puts that same product on a consolidated shipment, the freight rate is far lower — approximately $540 to $1,000. The manager is very happy with his savings — until the consolidated load is ruined by a temperature excursion. He has now lost about $218,000 worth of product by trying to save $3,300."

The tangible loss is almost nominal when compared to the total cost of the loss. "If you're not able to provide product, someone else will, so you lose that sales opportunity," Pétursson says. "More importantly, once customers start using another product, many won't change, so you've lost that market share permanently. That can translate into millions in lost revenue."

Figure 3: Elements of the Total Cost Approach Iceberg



Source: DHL 2015

PARTNERING FOR SUCCESS

Taken together, the four essentials of the smarter life sciences supply chain drive powerful benefits. They safeguard product, effectively manage complexity and risk, reduce total cost, and improve profitability and competitiveness.

"A consistent global approach to managing the new temperature-controlled pharma supply chain is the most effective," McHarg believes. "Many large pharma companies are doing just that — mapping all of their shipment lanes, grouping them into channel types, and specifying approved solutions for each channel type. Supply chain decisions then become more standardized and manageable."

Beyond executing the specifics of infrastructure, data analytics, people, packaging, and total cost management, the success of a temperature-controlled pharmaceutical supply chain comes down to one powerful concept: collaboration.

"Our most successful supply chain outcomes come from when we have good collaboration along the whole chain," says Mattias Almgren, deputy CEO of container manufacturer Envirotainer. "The more we are able to break down the walls between shippers, airlines, freight forwarders, packaging suppliers — the more we all succeed." ■

Editor's note: This article is based, in part, on a recent whitepaper — The Smarter Cold Chain: Four Essentials Every Company Should Adopt, written by Lisa Harrington and published by DHL.

FSMA: How to Avoid the Compliance Cops

HALT!

Be on the lookout for the Food Safety Modernization Act, which will impact all food shippers and carriers. We rounded up some expert advice, because if you don't know the new rules, whatcha gonna do when they come for you?

Preparing for FSMA: A Proactive Approach Reduces Unnecessary Waste and Litigation

CHRISTOPHER J. LALAK Associate, Benesch, Friedlander, Coplan & Aronoff LLP
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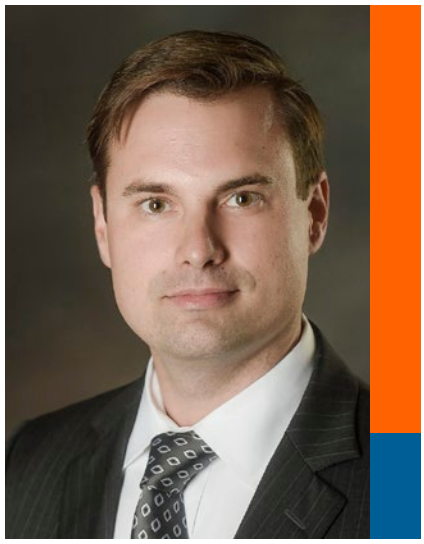
Implementation of the Food Safety Modernization Act (FSMA) has been anything but speedy. The FSMA, which was signed into law in 2011, authorizes the Food and Drug Administration (FDA) to implement regulations geared toward food safety, and has no true impact until these underlying regulations become effective.

Now that two of the final regulations are finally released, and the FDA's Sanitary Transportation Rule is set to be released in a few months, all segments of the food supply chain should take a proactive approach to preparing for the regulations — the FDA's lack of urgency notwithstanding. This is particularly true for shippers.

Under the FDA's forthcoming Sanitary Transportation Rule, for example, shippers are responsible for identifying the requirements for all temperature-controlled food, as well as setting the sanitation and vehicle maintenance requirements for carriers.



The Letter of the Law

The proposed rule is unforgiving, and demands strict adherence to these shipper-defined requirements to keep the food from becoming "adulterated" within the meaning of the Food, Drug, and Cosmetic Act, and thus becoming unfit for consumption. Given the FDA's approach, it is easy to see how needless waste could occur if shippers are not careful in their approach to setting temperature requirements.

Consider a truckload shipment of yogurt to be transported from a shipper's facility. Assume that the shipper, pursuant to the Sanitary Transportation Rule, designates that the yogurt is to be maintained at 35 degrees throughout transport. After being loaded onto a carrier's trailer, however, normal fluctuations during transport cause the temperature inside the refrigerated trailer to rise to 36 degrees before returning to 35 degrees.

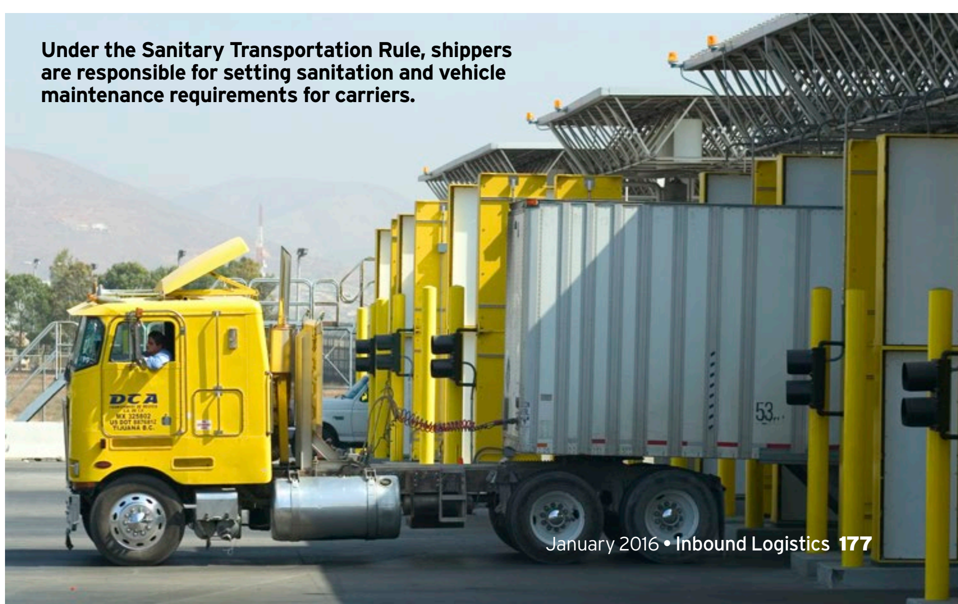
Despite the fact that the yogurt is still perfectly safe following this brief deviation from the designated temperature setting, the entire shipment is nevertheless "adulterated." A receiving facility cannot accept it, and it can't be salvaged or sold on the secondary market. It is a complete waste, and will likely lead to costly and time-consuming claims litigation, and the unnecessary disposal of perfectly good product.

The good news is that shippers can avoid this scenario by planning at the outset, and by setting thoughtful temperature requirements for the product in question.

In the above scenario, if the shipper set parameters for the yogurt shipment that specified a desired temperature of 35 degrees throughout shipment, but further specified that the food is not to be considered unsafe or adulterated until it reaches a certain temperature, or is exposed to a certain temperature for a certain length of time, undue risk of needless waste could be mitigated while still preserving concerns about product quality.

The same analysis applies to vehicle maintenance and sanitation requirements. Here, too, shipper-set guidelines govern shipment. And here, too, thoughtful requirements in addition to proactive discussions with carriers about their plans will help make compliance as painless as possible.

Although the final rule is not yet released, it is coming. Many analysts suggest that the final rule will be substantially similar to the proposed rule; indeed, some predict as high as 95 percent similar. Bottom line: The rule is not likely to change much, and delaying preparations for compliance is equally unlikely to prove beneficial to shippers.



Under the Sanitary Transportation Rule, shippers are responsible for setting sanitation and vehicle maintenance requirements for carriers.

How FSMA Impacts Inbound Food Transportation

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The Rule on the Sanitary Transportation of Human and Animal Foods impacts shippers, carriers, and receivers of food that is transported by truck or rail with the intention of being consumed within the United States.

Don't let the exclusion of air or containership freight fool you. Once food is offloaded from a plane or a ship, it almost always goes on a truck for transportation. Hence, it is covered by the rules.

Many companies now have less than one year to change their processes, procedures, and documentation systems or risk prosecution for non-compliance under the food transportation rules. Bulk foods and those "not completely enclosed by a container" that require sanitary and temperature-controlled transportation are in the FDA's bullseye.

FSMA and other food import rules call for registration, certification, and prior notice for all non-U.S. farms, carriers, and shippers intending to import food into the United States. Documentation regarding planning, implementation, verification, and validation of controls designed to prevent food contamination during transportation is required. Inbound shipments that arrive without documented compliance allow the FDA to seize, hold, and destroy them.

Under the new rules, members of the food supply chain share liability for the food produced, processed, packed, and transported. The FDA has successfully prosecuted several company officials for knowingly transporting contaminated cantaloupes across state lines.

With food imports continuing to increase because of extended supply chains and U.S. consumer preferences, companies that purchase and import foods must immediately begin to upgrade their food transportation systems. As the Sanitary Transportation Rules imply, these companies must develop, document, and prove they established container and trailer sanitation processes through preventive standards for cleaning and sanitation testing.

Similarly, data regarding required

The FDA is partnering with Customs and Border Protection to control imported foods at U.S. ports. Importers, carriers, and receivers need to cooperate to assure they comply with new food transportation rules.

Playing by the Rules

The FDA's proposed rule on Sanitary Transportation of Human and Animal Food, required by the Food Safety Modernization Act, would establish criteria for sanitary food transportation.

Specifically, the proposed rule would establish requirements for:

- **Vehicles and transportation equipment:** Designing and maintaining vehicles and equipment to ensure they don't contaminate the food that they transport.
- **Transportation operations:** The measures taken during transportation, such as adequate temperature controls and separating food from non-food items in the same load, to ensure food is not contaminated.
- **Information exchange:** Procedures for shippers, carriers, and receivers to exchange information about prior cargos, cleaning of transportation equipment, and temperature control.
- **Training:** Carrier personnel need to understand sanitary transportation practices and document the training.
- **Records:** Carriers and shippers need to maintain written procedures and records related to transportation equipment cleaning, prior cargos, and temperature control.
- **Waivers:** FDA procedures to waive any of these requirements if it determines that the waiver will not result in transporting food under unsafe conditions.

*Source: fda.gov. The FDA recommends consulting the proposed rule for specific requirements.


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temperature controls for transported perishables must be available for FDA or food safety audits. Taken together, the FDA considers container sanitation and temperature monitoring to be preventive food safety transporter controls.

So, what should shippers, carriers and receivers do? Basically, shippers of perishable food that is partially exposed to the environment are required to provide carriers with written sanitation and temperature control requirements for the transport of their foods. The carrier is expected to comply with those requirements, and offer documentation.

Carriers should pre-cool containers and trailers used to transport perishable foods according to the shippers' temperature specifications.

Both the shipper and carrier must maintain written procedures detailing sanitation and temperature processes. There must be proof that the procedures are followed (verification) and cover requirements for preventive control over potential hazards (validation), meaning that the container or trailer should be washed and sometimes sanitized to remove residue or contaminants.

The Outer Limits

There should also be clearly stated upper and lower temperature limits that need to be maintained during transportation, as evidenced by data from a temperature monitoring and reporting system that the shipper, carrier, and receiver can share. Ideally, the reporting provides some kind of alert when the temperature goes beyond the established limits. Of course, the safe transportation of the type of food carried is critical.

With the FDA partnering with Customs and Border Protection and Homeland Security to control imported foods at U.S. ports, inbound shippers, carriers, and receivers need to cooperate to assure they comply with new food transportation rules. Companies need to assure that their supply chain partners are in agreement and in control of food transportation processes. Current food safety audit standards need to expand to include load, unload, and in-transit operations, and must cover all tools and equipment involved in those processes.

5 Ways to Manage Supplier Quality to Ensure FSMA Compliance

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Today's food and beverage manufacturers are under more pressure than ever to effectively manage the quality of ingredients and materials across the supply chain. On top of that, new regulations are being put into law, forcing them to not only have supplier and importer quality management procedures in place, but also to prove that the supplier quality regimen for suppliers and importers—especially for high-risk ingredients—is executed.

FSMA requires manufacturers to demonstrate that they know which supplier sites are providing ingredients and materials to which manufacturing sites, and that those supplier sites are meeting the quality programs put in place via the manufacturer's supplier quality management program.

Companies may be forced via FSMA to audit every supplier site based on risk, as well as ensure that all required documents are on file for every supplier site. Communicating with suppliers via email, fax, and paper makes it virtually impossible for manufacturers to comply with new regulations, and will add such a high cost to quality that most companies will see a drop in top-line revenue due to the hit product margins will take.

Here are five steps to implementing a supplier quality management program that supports FSMA compliance, takes the complexity out of managing supplier quality, and allows you to put a program in place that has sustainable business benefits.

1. Establish a supplier foundation.

Create a single repository of all the suppliers you work with, the supplier sites where your ingredients or materials are sourced from, and the class of ingredient or material those suppliers provide. Use this repository to leverage your newfound knowledge of who your suppliers are and to put an effective audit program in place.

> Quickly onboarding new suppliers helps contain cost and grow revenue.

With a workflow-based tool, ensure that your audit programs and any follow-ups are being executed in a timely manner, and if they are not, that all parties involved are notified.

2. Put an effective supplier onboarding capability in place.

When on-boarding multiple suppliers at the same time, initial top-level questionnaires and risk assessments can help ensure

Affiliated Foods Midwest Finds Compliance in the Cloud

With the signing of FSMA in 2011, wholesaler and retailer executives are now legally responsible for supply chain safety. In addition, FSMA's focus on prevention and seven new rules require retailers and wholesalers to collect, manage, and store multiple documents from each vendor for compliance. These documents must be accessible upon FDA request within 24 hours and two years back. Importantly, senior executives are now responsible for the compliance of their supply chain with FSMA.

At the Food Safety Consortium held near Chicago in November 2015, Affiliated Foods Midwest (AFM), a member-owned cooperative that serves independent grocers throughout a 15-state area, related how it prepared for FSMA compliance and decided to move away from its "home-built" and "highly manual" compliance system, which stored both soft and hard copies of vendor documents. With FSMA rules focused on documenting preventive measures, AFM leadership assessed the company's gaps and determined they needed to be more proactive.

At the start of its undertaking, about 30 percent of vendors were non-compliant with the three records required: Certificates of Liability with specified limits, Hold Harmless forms, and W-9s.

"We knew compliance built on trust was not enough and wanted more business documents and regulatory records collected," said John Grimes, director of safety for AFM. "We also needed to increase compliance, and be more proactive, so we were looking to automate our systems."

AFM decided to adopt the cloud-based Compliance Management System from ReposiTrak, a provider of solutions to help companies comply with regulatory requirements, to proactively manage both business-related documents and FSMA-related records. Once implemented, ReposiTrak reduced vendor non-compliance by 60 percent in the first 90 days through proactive alerts and automated exception reporting.

"With our prior system I could find a requested document within 24 hours, but with ReposiTrak, I can pull it up and instantly share it with an FDA agent even before they have a chance to leave my office," Grimes said.

Document management at AFM is now more proactive than reactive. The ReposiTrak system automatically sends alerts to Grimes and the vendor when documents are missing, when insurance limits are too low, or when a document is due to expire. ReposiTrak's system enables AFM to proactively manage more documents by vendor than in the past.

you meet FSMA regulations for supplier and ingredient onboarding. No matter the reason, being able to quickly onboard new suppliers creates significant impact on your company's ability to contain cost and grow revenue.

3. Better manage the ingredients you are actually sourcing from your suppliers.

Once you have a deeper understanding of your suppliers, you can effectively communicate ingredient specifications' changes driven either by you as a manufacturer, or the supplier, to ensure that you are never producing with the wrong ingredient specification. This step allows quality to play a huge role in both the reduction of cost of goods sold and the cost of quality, while further enabling effective risk and change management, as well as FSMA compliance.

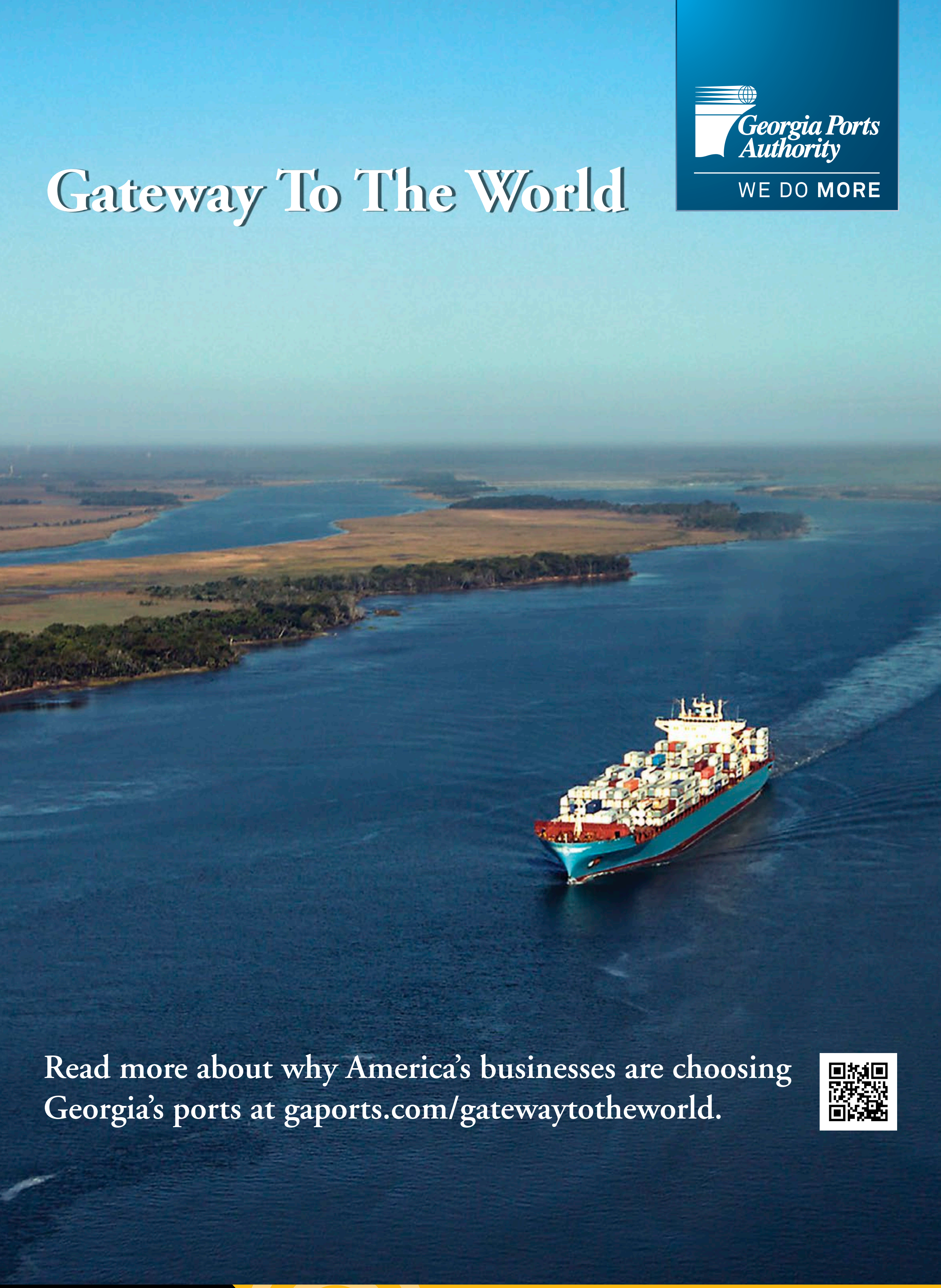
4. Integrate incident management.

Putting a quality management system in place allows you to truly understand the impact that the ingredients and materials sourced from your suppliers has on complaints from the market and on internal quality incidents.

Streamlining communication makes suppliers want to work with you to resolve issues affecting your product quality as quickly as possible. This leads to reduced raw material cost and variability, improved yield, and increased supply chain reliability.

5. Implement real-time performance management.

You now have all the information required to put a true supplier performance management system in place, with all of the key performance indicators you require. A supplier performance management system allows you to focus on which of your suppliers or internal manufacturing sites are having the most trouble meeting your quality goals. This drives continuous supplier quality improvement, grows operational productivity, reduces costs, and increases the performance of new product introductions.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Developing a Track-and-Trace Strategy that Keeps Regulators – and Customers – Happy

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Track and trace has long been an important part of doing business in the perishable food industry. FSMA ups the ante by putting formal requirements around the process.

Track and trace is not just about meeting regulatory requirements; it's also about brand preservation. Should a product be recalled, your company must be able to figure out its location quickly, concisely, and in an organized manner. Anything less could severely damage your brand—a company's single most valuable asset.

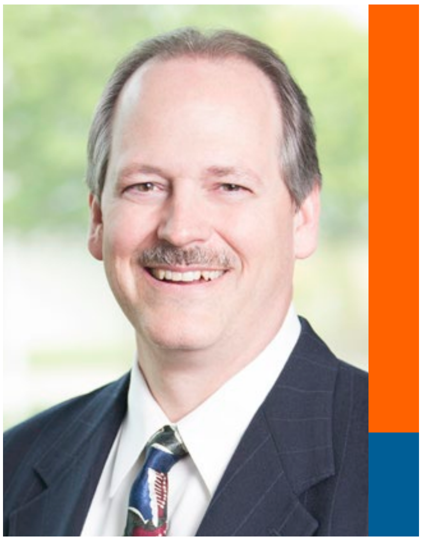
The key to mitigating risk is swift, clear access to data about your products—where the components came from and where the finished product has gone. That's where an effective track-and-trace strategy comes in.

Here are three ways to ensure your track-and-trace strategy protects your brand during a crisis.

1. Invest in a system that automatically gathers information and easily creates reports. When a recall goes into effect, a company needs to act fast. The response becomes more complicated when dealing with products that contain multiple components from different suppliers. A company could hire 10 new employees to tackle the new FSMA data-gathering and reporting requirements. But imagine trying to dig through file cabinets to figure out exactly which shipments of frozen quiche contain contaminated E coli spinach.

An automated solution is more accurate and cost-efficient. When a track-and-trace strategy functions as it's supposed to, it collects information from every step in the process: what treatments organic farmers used on their crops; when components entered and left the manufacturing facility; and where the finished product is going.

A warehouse management system easily fulfills this goal by recording and monitoring information about products during each



step of the supply chain. The system keeps all the data in one place, and provides an integrated platform among suppliers, manufacturers, and distributors. This helps streamline response not just during a recall, but also during normal operations.

2. Establish standardized processes. As soon as a company receives a request for information under the FSMA, the clock starts ticking. Instead of winging it when it's time to produce data, spend time now establishing protocols for responding to such requests. Think about how to gather and mine the data; which employees are authorized to access and compile it; and how to meet the requirement for delivering the data electronically. Enacting standardized, corporate procedures is as important as the data itself in ensuring that your track-and-trace strategy works when you really need it.

3. Validate the data. What good is a report if you can't trust the data that's in it? Conduct spot audits to make sure that the right information is collected, and that it is 100-percent correct. When a company automates a track-and-trace strategy, it puts a lot of trust in it—especially when bringing a new supplier online. Conducting spot audits guarantees that it is capturing information that's as close to perfect as possible.

When talking about track and trace, FSMA compliance is on the table, and brand protection is at stake. But by weaving together automated data collection, standardized response processes, and thorough validation procedures, shippers have the tools they need to protect their future, and handle recalls effectively and intelligently.

A solid track-and-trace strategy helps pinpoint when food products enter and exit a manufacturing plant, an important part of new FSMA data-gathering requirements.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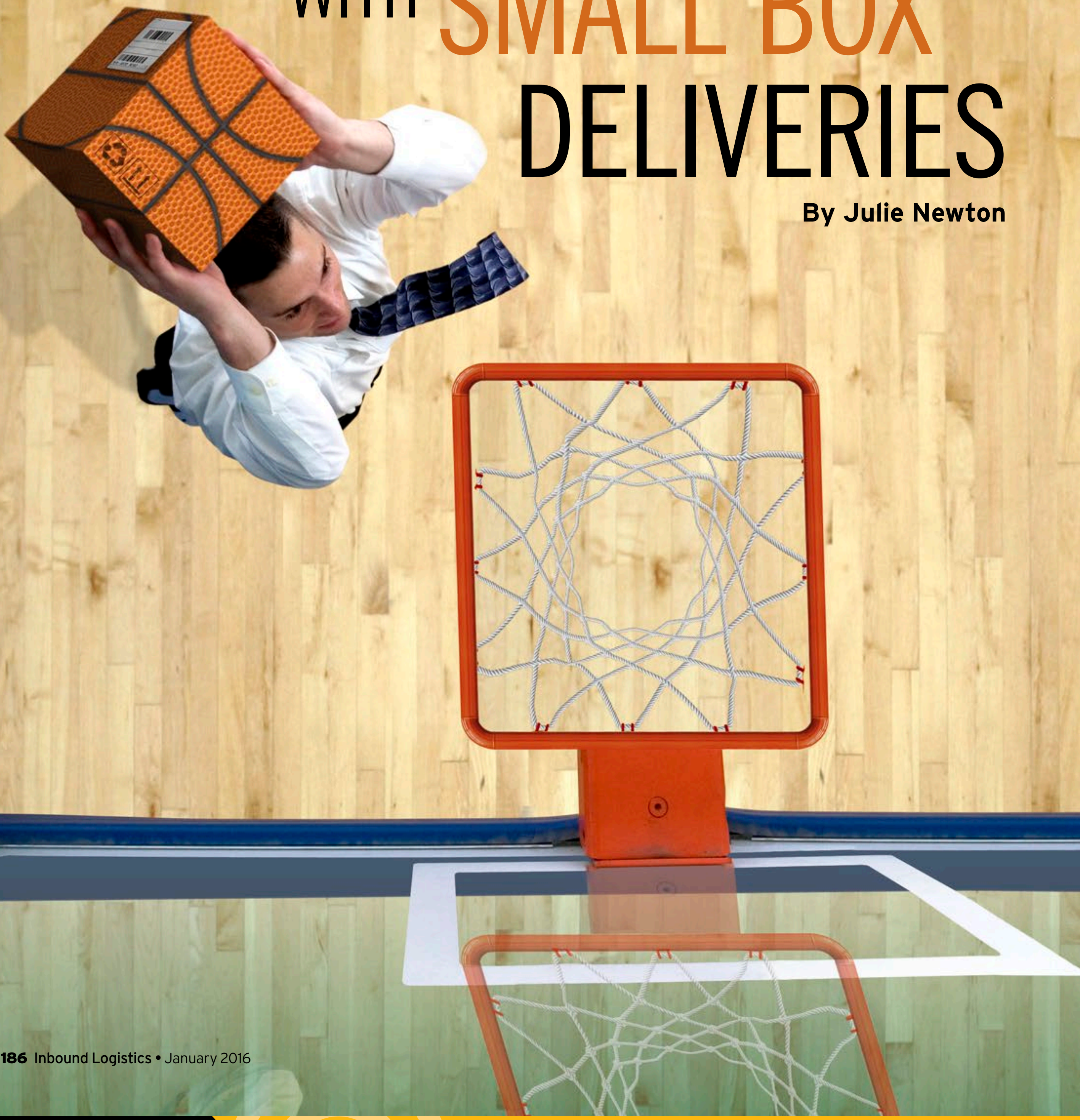
SWISH! SHIPPERS SCORE WITH SMALL BOX DELIVERIES

By Julie Newton



E-commerce got game in the retail arena, driving a sharp increase in small package volumes and netting more demanding consumers. Winning retailers are playing offense to meet these new challenges...before the clock runs out.

Locally and globally, consumers have greater access and more choices than ever before. These highly empowered customers determine what they buy, regardless of where it is manufactured; how they make the purchase, in stores, online, or via smartphone; and when and where goods are delivered.

E-commerce has become a part of daily life, providing consumers with options that transcend borders. Retailers have more avenues to sell their products, significantly extending their geographic reach. The result has been a skyrocketing volume of small parcels. During the 2015 holiday season alone (Thanksgiving through the end of December), UPS estimated it would deliver 630 million packages, up 10.3 percent from 2014.

While representing less than 10 percent of total retail sales, e-commerce is big business. In 2015, U.S.-based e-commerce was estimated to reach $350 billion. These figures were boosted by the 2015 holiday season, when half of all holiday shopping was done via e-commerce, according to National Retail Federation (NRF) forecasts.

Online shopping is not just for the holidays or for U.S. residents. A number of price- and brand-savvy international consumers are also taking advantage of new channels to purchase products from locations around the world. A growing middle class in some global markets is leading to increased consumption, a trend that is expected to continue in coming years. Business-to-consumer sales share will reach 35.1 percent in Asia in 2016, compared to 28.2 percent three years ago, predicts research firm E-Marketer.

Another trend impacting e-commerce is the increased use of mobile devices by customers, whether in stores or making online purchases. Twenty-four percent of all consumers planned to use mobile applications for browsing and shopping during the 2015 holiday season, up from 21 percent during the 2014 holiday period, according to the NRF. This indicates a greater reliance on mobile devices year round.

"At mid-decade, e-commerce appears to be the key market driver and shaper for all concerned: shippers, carriers, and logistics companies," says Bruce Carlton, president and CEO of the National Industrial Transportation League (NITL), a shipper association that includes all transportation modes. "Retail is being re-invented in real time, with order fulfillment rapidly moving from fast to faster to right now."

SHIPPERS SCORE WITH SMALL BOX DELIVERIES

Retailers are adopting a variety of supply chain practices that allow them to serve both brick-and-mortar facilities and an ever-increasing base of online customers. The scope of change and supply chain impact cannot be underestimated, says Corey Weekes, supply chain director for Hudson's Bay Company (HBC), one of the fastest-growing department store retailers in the world.

The HBC portfolio includes eight banners, ranging from luxury department stores to off-price stores, with 460 retail locations and 65,000 employees worldwide. In North America, HBC's leading banners include Hudson's Bay, Lord & Taylor, Saks Fifth Avenue, and Saks OFF 5th.

"E-commerce is huge, and we expect continued growth over the next several years because we live in a society that is increasing its online presence," says Weekes.

Sears Holdings processes a huge volume of boxes with a three-pronged strategy: implementing technology, strategic partnerships with providers, and integrated planning.

E-COMMERCE: A NAIL BITER

HBC has several hundred thousand square feet of warehouse capacity in the United States alone, but even with those numbers, servicing a national e-commerce customer base with expanding product offerings and tremendous online purchasing growth presents exciting challenges.

How does a retailer address these challenges? "First, never think you have enough capacity, as forecasting long-term e-commerce growth and impact is an art as much as it is a science," Weekes says.

He also recommends having a good plan and supporting IT infrastructure to handle spikes in volume at any time, in addition to the seasonal shopping cycles retailers typically experience. And, "Retailers must have a robust strategy for moving product in and out of their own facilities quickly to keep expected deliveries on time and customer satisfaction high," he adds.

HBC operates several distribution centers in Canada, with one dedicated solely to e-commerce. In the United States, HBC maintains both dedicated and mixed-use facilities to fulfill e-commerce needs.

Like the rest of the industry, HBC is investing in technology—with a focus on automation—to speed distribution center processes. HBC also uses available labor pools to assist during peak periods, especially during seasonal spikes.

"Clearly, we rely on retail forecasting models to plan operations," says Weekes. "If a product is an unexpected hit or does not meet market expectations, however, we must be able to react quickly to re-supply or clear inventory." HBC uses small parcel carriers for some shipping needs, he adds.

THREE POINTERS

Retailer Sears Holdings Corporation addresses the needs of multiple customer channels through an integrated retail model, which is anchored by the use of technology, strategic partnerships with transportation services providers, and integrated planning to maximize all assets.

"Our company has had a well-established home delivery infrastructure for some time, and we were among the first retailers to take some innovative steps to add convenience for our members and customers, while also creating supply chain efficiency," says Bill Hutchinson, president of supply chain for Sears Holdings Corporation.

A leading integrated retailer, Sears Holdings Corporation is focused on seamlessly connecting the digital and physical shopping experiences to serve its members—wherever, whenever, and however they want to shop. Sears Holdings is home to Shop Your Way®, a social shopping platform offering members rewards for shopping at Sears and Kmart, as well as with other retail partners across categories important to them. The company operates through its subsidiaries, including Sears, Roebuck and Co., and Kmart Corporation, with full-line and specialty retail stores across the United States.

One example of how Sears Holdings delivers on its promise of wherever, whenever, and however is its "Buy Online, Pick up in Stores" option implemented 14 years ago. Since that time, the company has

expanded its series of services designed to connect the online and in-store shopping experience. Sears offers "In-Vehicle Pick up, Return and Exchange in Five" service. To use this service, customers access Sears' "Shop Your Way" mobile app, allowing them to pick up, return, or exchange their purchases for free without leaving their vehicle. The service is guaranteed to take five minutes or less of the consumer's time.

Most recently, Sears Holdings announced a service designed to help buyers of major appliances. "Meet With An Expert" allows customers to schedule in-person meetings with home appliance experts at the Sears retail store of their choice.

PICK-UP GAME

Another retailer that is offering multiple options to serve both in-store and online shoppers is Kohl's Department Stores. "Our fulfillment ecosystem consists of our Kohl's store chain, distribution center, and e-fulfillment centers, as well as our direct ship partners who fulfill orders from our website," explains a company spokesperson.

Kohl's launched ship-from-store capabilities to its entire base of more than 1,600 stores in 2015. Kohl's also offers buy online and pick up in store service throughout its network. "These services enable us to leverage store inventory, local geographies, and network of associates to further support our growing e-commerce business," the spokesperson says.

In the future, other retailers are likely to embrace the strategies employed by Sears Holdings and Kohl's. A recent study of 60 leading retailers, conducted by Deloitte, indicates that 94 percent of respondents already offer, or plan to offer, an option for picking up online shipments in retail locations.

Consumers clearly find value in these types of services. In 2015, of those customers who planned to shop online during the holiday season, 46.5 percent planned to take advantage of retailers' buy online, pick up in store or ship-to-store options, according to the NRF Holiday Survey.

While these services are all designed to provide flexibility for customers, retailers can also use them to enhance supply chain efficiency, another example of challenges leading to opportunities. "Our supply chain team has been effective in partnering with our store teams," according to Hutchinson.

"It is all about using assets differently," he says, "with retail locations serving as a component of the overall distribution network." One potential benefit is the ability to access inventory from across the enterprise. With many retail distribution centers already operating at maximum capacity, store-based fulfillment offers retailers a way to handle seasonal changes in volume without the capital investment of adding or expanding warehouses.

"Proximity is key," notes Hutchinson. "We are able to fill orders closer to the customer, reduce logistics costs, and cut delivery cycle time. The difference between our supply chain and others is the process that we use to determine where our orders are filled. We use a sophisticated system that looks at our in-stock position in certain markets. It evaluates the cost-service trade-off of certain products by dimensional weight factor or freight cost, and then makes routing decisions of where to fulfill that order."

E-commerce is driving growth for retailers of all sizes, including some businesses that sell their products solely online. One example is Discover Books, an online used bookseller that sources products from donation points across the United States, as well as by purchasing used books from Goodwill. Truckload carriers ship products to two large warehouses, located in Toledo, Ohio, and Hammond, Ind. Discover Books' customers include schools and libraries; its primary market is individuals requiring home delivery.

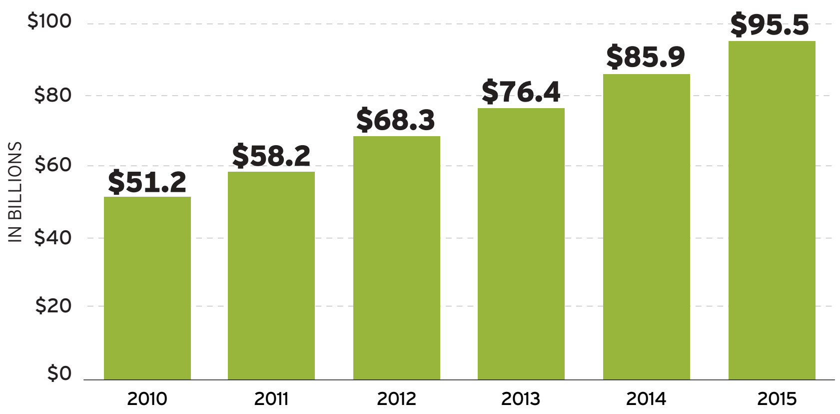
FINAL STRETCH

One common factor mega-brands such as Sears and Saks and niche retailers such as Discover Books share is their use of small parcel providers to assist with final-mile distribution. Discover Books partners with DHL for its outbound deliveries. In addition to consolidating shipments, DHL forwards them to the U.S. Postal Service (USPS), which ultimately makes the final delivery.

Cost is a key driver for Discover Books and its customers, and DHL is responsible

E-COMMERCE: A SLAM DUNK FOR SMALL BOX DELIVERIES

Small package volume continues to rise, mirroring the growth of e-commerce.



2015 figure is a forecast

Source: Forrester Research

UPS Access Point Network locations offer package pickup and drop off, and include local businesses, such as dry cleaners, with extended evening and weekend hours.

for determining the most economical way for the USPS to handle each shipment. Discover Books' customers can track their shipments on the DHL website.

Sears relies on a number of third-party logistics and transportation services providers to achieve supply chain objectives. "Parcel carriers play a huge role in our online customer fulfillment process; last-mile planning and execution are critical," says Hutchinson.

It is crucial that parcel carriers are involved in the planning process as retailers determine their volume requirements. "The earlier the retailer and the transportation provider begin the planning process, the better," says Hutchinson. This is just one dynamic impacting small parcel providers.

KEY PLAYERS

"Just as retailers and manufacturers find it necessary to develop omni-channel capabilities, small parcel service providers need to find the best combination of logistics resources to facilitate not only outbound to customer and consumer shipments, but also product returns that are typical of Internet retailing," explains Dr. John Langley, a professor at Penn State.

FedEx views e-commerce trends as positive, stating, "The ongoing shift to Internet shopping is fueling growth for FedEx, and we continue to invest in network growth and capacity." The company invested $1.6 billion in FedEx Ground during its 2015 fiscal year (June 1- July 31) to increase capacity and automation.

The average number of packages FedEx Ground handles every day has doubled in the past 10 years. "Thanks to strategic investments in the network, FedEx Ground is able to handle that volume while continuing to enhance on-time service levels to exceed 99 percent," notes David Payton, vice president of marketing, FedEx.

The company works with customers around the globe to develop smart solutions for growing their businesses. "We have a portfolio of tools to help with cross-border e-commerce, from international shipping services to customs and regulatory support," says Payton.

FedEx Corporation acquired Bongo International, a provider of cross-border enablement technologies, to help merchants and consumers facilitate international e-commerce shipments and orders. Bongo International complements and expands the FedEx portfolio of offerings, according to FedEx. Bongo International's capabilities include duty and tax calculations; export compliance management; Harmonized Schedule classification; currency conversions; international payment options inclusive of language translation; shopping cart management; and more.

The ability of small parcel providers to assist with global shipping is critical. "E-commerce is an excellent platform for many retailers to expand their reach," notes Jon Gold, vice president, supply chain and customs policy, NRF. "International shipping, however, requires expertise and understanding of trade facilitation, rules and regulations, and even health and safety considerations."

UPS TAKES A SHOT

UPS is also focused on serving consumers and merchants around the globe. "With the substantial acceleration of growth in e-commerce over the past five years, UPS has built a series of technologies and processes, such as UPS My Choice and UPS Access Point Network, to increase efficiency and enhance the consumer's experience," says Bala Ganesh, retail director for UPS.

"We listened to the challenges e-commerce growth creates for consumers," says Ganesh. "Online shoppers told us they want convenient delivery options to fit with their busy lifestyles. In many cities around the world, consumers do not have an easy way to accept delivery at home, which discourages online shopping.

"The UPS Access Point Network addresses the challenge by providing an alternate delivery location so consumers can pick up and drop off packages on their schedule," he adds. By the end of 2015, there were 8,000 U.S. locations and 22,000 UPS Access Point locations around the world.

While e-commerce has impacted major small parcel providers such as DHL,

FedEx, and UPS, it has also led to niche providers that aggregate shipments and utilize services of a wide range of providers for delivery.

One example is MyUS, a package consolidator specializing in international shipments. After becoming a member of MyUS, consumers are assigned a MyUS address that ships directly to the consolidator's facility in the United States.

Customers enter their MyUS address as the "ship to" address when purchasing products from any U.S. store online. Merchandise arrives at the MyUS facility, where it is stored and ultimately shipped, along with other shipments destined for a specific location.

Shipments typically arrive in two to four days, according to Ramesh Buluso, CEO of MyUS. His firm serves more than 200 countries, and he notes increased consumption from the Middle East, North Africa, and Asia.

"RETAIL IS BEING RE-INVENTED IN REAL TIME, WITH ORDER FULFILLMENT RAPIDLY MOVING FROM FAST TO FASTER TO RIGHT NOW."

– Bruce Carlton, President and CEO, National Industrial Transportation League

As the most dominant player in the online game, Amazon ships 5.6 million packages daily, notes Satish Jindel, founder of SJ Consulting Group. Amazon is a major user of the USPS and parcel carriers for delivery to customers, as well as less-than-truckload carriers to bring products from suppliers into more than 60 Amazon fulfillment centers in the United States, says Jindel.

POWER FORWARD

Clearly, demanding and empowered consumers are shaping today's marketplace, and retailers, wholesalers, and providers are all adapting to this new business environment. "Overall, small parcel carriers have done a good job of reacting to and continuing to address the unique requirements of e-commerce," says HBC's Weekes. "They have supported the needs of e-commerce, and always try to remain ahead of capacity requirements especially during busy shopping periods." ■

TRENDING NOW:

SUPPLY CHAINS GET SOCIAL

BY MERRILL DOUGLAS

Social networks give supply chain organizations efficient tools for promoting collaboration and getting critical information to everyone who needs it.

By now, it's axiomatic: You must be on social media. Twitter, Facebook, LinkedIn, YouTube, and other platforms offer powerful tools for staying in touch with customers and promoting your brand.

But where does the supply chain come in? Can connections among people who know other people, who know still more people, help you forecast demand, procure product, move shipments, manage suppliers, or fulfill orders?

The answer is yes—but not always in the way you'd expect.

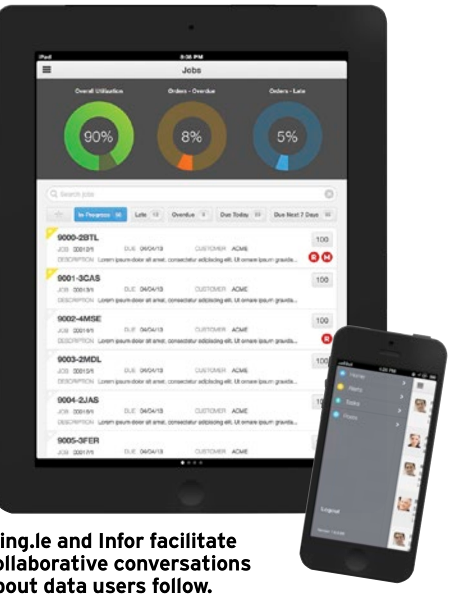
In supply chain management, the most active networks for sharing business information aren't the well-known public sites, but the cloud-based collaborative platforms sometimes known as supply chain operating networks (SCONs).

The term SCON refers to platforms created by companies such as GT Nexus, Elemica, E2open, Descartes Systems Group, and others that allow large numbers of trading partners to exchange data about supply chain transactions. Adrian Gonzalez, president of Adelante SCM, a peer-to-peer learning and networking community for supply chain and logistics executives, says he coined the term in 2003.

Historically, companies have used electronic data interchange (EDI) or Internet portals to trade data and documents with suppliers, customers, and service providers. Companies used these tools to create private networks connecting them with those partners. But when, for example, a food manufacturer sells product to dozens of grocery chains, that company might have to join dozens of different networks.

TRENDING NOW:

SUPPLY CHAINS GET SOCIAL



Ming.le and Infor facilitate collaborative conversations about data users follow.

"Why not connect once to a network and have that be the central hub that connects everyone to everyone else?" Gonzalez says. That's what Facebook and LinkedIn do for individuals, and it's what SCONs do for supply chain partners.

When you need to share information with multiple trading partners, point-to-point methods such as EDI and email often cause problems. "There's no single version of the truth," says Greg Kefer, vice president of corporate marketing at GT Nexus, Oakland, Calif.

A social network—whether a SCON or a public platform such as Facebook—eliminates that issue. "The data that everybody needs sits in the center of the network," he says.

If you use LinkedIn to note the fact that you changed jobs, that news becomes visible immediately to all your connections. If you receive a purchase order and you're on a SCON, that information becomes available immediately to all the suppliers, customs brokers, carriers, and other partners you've authorized to see that data.

> "Through social media, people who would never get invited to a meeting can have a voice."
>
> Nadine Jean-François, Director of Supply Chain Management, Valeant

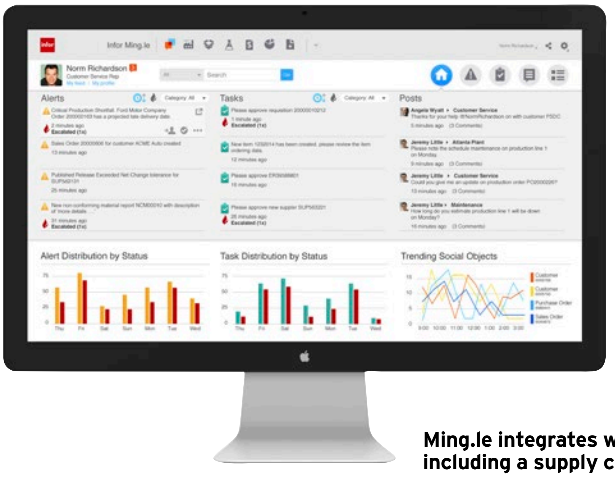
The social experience at GT Nexus will soon gain a new dimension, thanks to the company's recent purchase by the New York-based software company Infor. A developer of solutions for enterprise resource planning (ERP) and other business applications, Infor acquired GT Nexus in September 2015.

Infor's portfolio includes a networking product that is not a SCON, but a different kind of social platform called the enterprise social network (ESN).

Companies use ESNs to give employees—and sometimes external partners—the same connectivity they'd find on public social networks, but tailored to the firm's needs and confined to the enterprise. Among the best-known ESNs are Yammer (acquired by Microsoft in 2012) and Chatter (developed by Salesforce). Infor's ESN is called Ming.le.

Like a SCON, an ESN makes vital information available to everyone who needs it. "An ESN puts all your conversations in a centralized place that others can search for, starting to create a knowledge base," says Emily Williams, senior product manager for Ming.le at Infor.

But unlike a SCON, an ESN is designed mainly for discussions, not transactions. You use it to speculate on how the long-range weather forecast will affect demand for ski gear—not to note that your containerload of ski gear has just left Shenzhen.



Ming.le integrates with Infor's business applications, including a supply chain management platform.

If three people on an ESN start talking about a truck that has broken down, and the need to rush the stranded load to Chicago, other people who notice those posts could jump in to offer help.

In most ESNs, you won't see the status message from the trucking company that alerted the shipper, through its transportation management system, about the breakdown. In Ming.le, though, you might indeed see that alert. Ming.le lets users integrate data about business activities—drawn from Infor's supply chain solution and its other applications—with their unstructured, text-based posts.

"We're embedding social touchpoints in the ERP, asset management, and supply chain applications, so users can start to follow objects coming from their core systems, such as orders or requisitions," Williams says. "We have workflow, and conversation that ties to that workflow."

Among other things, that kind of integration could be useful to employees who aren't directly involved with a certain activity but need to stay aware of it. "For instance, sales people want to know when they're going to get new stock for a product on back order," says consultant Tony Martins, president of Tony Martins and Associates in Montreal. "They can get direct communications from the data without anybody needing to tell them."

Ming.le already plays a role in some companies' supply chain operations. More firms might join the conversation now that Ming.le and GT Nexus operate under the same corporate roof.

With 25,000 businesses exchanging data on its platform, GT Nexus gives Infor a way to extend Ming.le outside a company's

own four walls, bringing trading partners into the discussion. "We're going to make Ming.le network-based and have that full, end-to-end conversation across the supply chain," Williams says.

Officials at Infor also expect a complementary change, adding free-flowing conversations to GT Nexus. That would give GT Nexus users a channel for verbal communication that's just as collaborative as the channel they use for data. "People want to get off email because it's siloed," Kefer says. "Collecting a message, attaching it, and keeping it along with all the transactional information will be valuable."

Text-based posts add context to transactions. "You can put only so much information in a structured document like an order or a shipping event," Kefer says.

Email can add context. But just as it's difficult and awkward to share and discuss your vacation photos with scores of friends and relatives via email, it's also difficult to hold business conversations that way with scores of colleagues and partners. "Social media becomes an efficient way of communicating," he says.

A SCON—which is essentially a network of IT systems—is useful as long as business operations run according to plan. "But we all know that exceptions happen in a supply chain: A truck gets delayed, an order gets cancelled, demand is greater than expected," says Gonzalez. "Ultimately, people have to get involved."

That's where a human-to-human networking tool such as Ming.le comes in as an alternative to phone calls, meetings, and emails with attachments. "Social networking provides another set of communications and collaboration tools that are arguably more efficient and more scalable," he says.

Bringing Global Partners Together

Adding social conversation to a platform such as GT Nexus also gives partners across a large supply chain, dispersed around the world, an easy way to push important events to the foreground. Say, for example, a big storm is brewing in the Caribbean. "You start to see trending conversations around the hurricane," Williams says. If holding those discussions via email, individuals who weren't included on the distribution list might not learn about the hazard, much less get the chance to join a debate about how to avert transportation delays.

Martins has used ESNs extensively, in the past when he worked as a supply chain executive at Teva Canada and other pharmaceutical firms, and today in his work with clients in manufacturing and supply chain organizations. Like Kefer, he says that social media offers strong tools for dealing with exceptions to established processes.

"When an unexpected event occurs, you may need only two, three, or four people to solve the problem," Martins says. "But it's not always the same people." To find the right experts for a given situation, companies usually bring large groups of people into meeting after meeting, until a solution emerges.

A social model does much better at identifying experts who can solve specific challenges. When someone posts a question, everyone sees it, and the best-qualified individuals jump into the conversation.

"It's not linear," Martins says. "The way they solve the problem is a bit chaotic, because they're not following a recipe." About 75 percent of the activity in a business consists of the unexpected, he says. Those situations are ripe for social collaboration.

LoadDelivered takes advantage of the latest social platforms. It uses Yapmo for internal collaboration, Supply Chain Insights to gather research and collaborate with other industry professionals, and Twitter, LinkedIn, and Facebook to recruit and share thought leadership.


WHEN YOU NEED YOUR SHIPMENT
DELIVERED FOR THE RIGHT PRICE,
IN THE RIGHT CONDITION,
AT THE RIGHT TIME.
CHOOSE VANTIX.

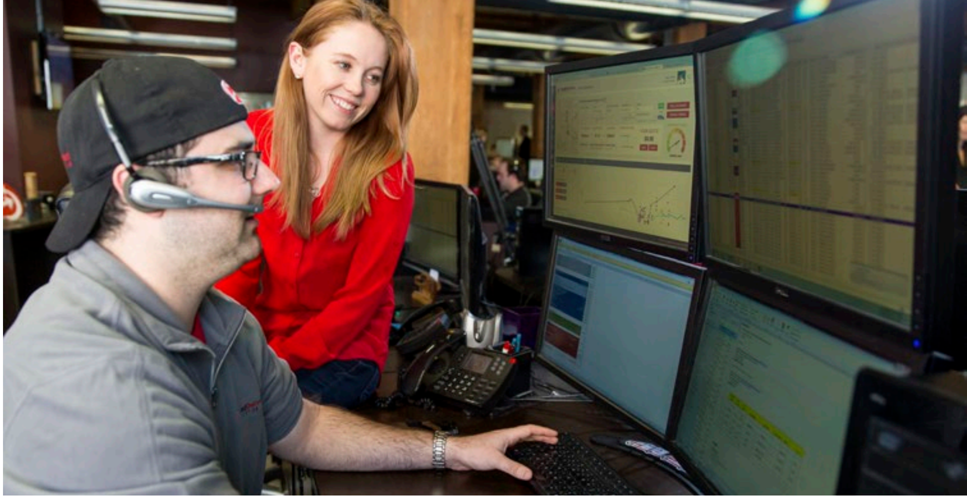
TRENDING NOW:
SUPPLY CHAINS GET SOCIAL

Nadine Jean-François, director of supply chain management at pharmaceutical company Valeant in Laval, Quebec, was Martins' colleague at Teva. Her organization made its first foray into social networking when it used Microsoft SharePoint to connect large groups of people around a common mission. Teva later moved to a customized tool similar to Yammer. At Valeant, Jean-François has led the use of Yammer with similar success.

The social platforms have proved effective as tools for collaboration. "Issues were resolved quickly, and people worked together much better," Jean-François says.

Once at Valeant, for instance, an individual who was wrestling with a packaging problem described the troublesome issue in a post and added a photo. "The packaging people posted a solution immediately," she says.

One benefit of social collaboration is the way it brings issues to the attention of people who play different roles, and can attack problems from many different perspectives. Say, for example, a manager posts about an equipment problem that will stall production of a certain product by several days. "The quality control manager will look at this wearing quality glasses, and will launch an investigation into the equipment to make sure the problem doesn't happen again," Jean-François says.



An initial experiment with social media for internal communication at LoadDelivered backfired when employees continued to use email, voice mail, and calendars as well.

"The engineering person will say, 'I'll immediately send somebody to fix it,' while the supply chain team will make sure that customers who need the product learn about the delay as soon as possible," she adds.

A social media platform assembles many more people than would ever sit together at a conference table. "People who would never get invited to the meeting can have a voice," says Jean-François. "That's extremely important. We found people who were real gems—people who were quiet but had amazing ideas."

At Teva, besides creating social groups for intra-company communications, Martins and Jean-François established private networks for discussions with some of the company's major trading partners—one partner company per network.

On the supplier side, each platform allowed Teva and a partner to discuss situations that might affect the supply chain. "We wanted to get early warning of supply issues, such as problems in the manufacturing operation," Martins says. "On the other hand, if we were experiencing a surge of demand in the market, and we needed them to react to it, we wanted to discuss that with them as soon as possible."

Friending Social Media

While social media platforms offer compelling benefits, establishing a great relationship with them means you might have to jump these hurdles:

- **Too many channels.** Hoping to streamline intra-company communications, several years ago third-party logistics company LoadDelivered implemented the enterprise social network Yapmo. But that platform turned out to be an imperfect fit. "Those platforms work better if you eliminate email," says Casey Stelletello, marketing coordinator at the Chicago-based firm. LoadDelivered never went that far. "Yapmo ended up just giving us another thing to check in addition to email, voice mail, and calendars," she adds.
- **The generation gap.** "For Generation Y—people ages 18 to 34—the notion of privacy is fuzzy," says Tony Martins, president of Tony Martins and Associates, Montreal. Gen Y thrives in the open, non-hierarchal world of social media, "but for older people, privacy stands for power and control," he adds. That makes social networking a tough sell at some companies, despite its great promise.
- **Lack of support at the top.** Tell executives that you want to use a social media tool "like Facebook," and they might not take it seriously, advises Nadine Jean-François, director of supply chain management at Valeant Canada in Laval, Quebec. When you implement a social network, educate upper management about how it works, and include them in the groups you create. "They need to have a presence, so they can guide people," she says. An executive might use a post to steer a conversation in a more constructive direction, or simply to praise a team for doing a great job.

Facebook, Twitter, and Beyond

While some supply chain organizations experiment with SCONs and ESNs, others are using public networks for business needs. For example, LoadDelivered Logistics—a non-asset-based third-party logistics (3PL) company with a strong focus on temperature-controlled freight—maintains a heavy presence on Facebook, LinkedIn, and Twitter.

Social networks are essential for

BlueGrace Logistics executes an open social media strategy that encourages employees and customers to interact online during normal business hours. The 3PL also runs competitions and recognition programs for employees who are the most social.

recruiting, says Casey Stelletello, marketing coordinator at the Chicago-based firm. Young job-seekers scoping out potential employers want far more information than they can find on corporate websites. "They're looking at all the social sites. They're looking at comments people make and pictures you've posted, to see if the company has the right feel for them," she says.

Personnel Get Personal

LoadDelivered's Facebook timeline is rife with photos of employees raising funds for charity, celebrating holidays, and volunteering. The company also uses Facebook to highlight industry awards and other good news, says Jennifer Staudt, also a marketing coordinator at LoadDelivered.

Those announcements appear on LinkedIn and Twitter as well. But LoadDelivered uses those platforms mainly to point readers to thought leadership pieces on its website, Staudt says.

BlueGrace Logistics takes its use of public social media one step further, using Twitter in particular as a primary channel for communicating with coworkers, customers, and other parties.

"When our employees start training during their first week at work, we teach them how to get on Twitter and set up a profile. We encourage them to create a work Twitter account with 'BG' in the name," says Whitney McKay, marketing and brand development director at BlueGrace, a non-asset-based 3PL in Riverview, Fla.

As employees and customers follow one another on Twitter and other platforms, those networks often replace more traditional communications media. "We try to steer away from sending an email for every little thing," McKay says. For instance, if a carrier calls or emails about a weather-induced service interruption, BlueGrace uses Twitter and Facebook to spread the word.

Several departments at BlueGrace maintain their own Twitter accounts. Customer service often uses Twitter to field questions and requests. Customers who use that channel never have to wait on hold for a representative or wonder how long it will take to get a reply to an email.

"You will get someone's attention fast if you tweet at our company page," McKay says. "As soon as we see it, we'll say, 'This person needs something,' and we'll send it to the right department immediately."

Identifying Suppliers @Risk

Companies are also starting to look to social media for help with supply chain strategy. Some see the networks as sources of information they can use to manage supply chain risk.

"For example, if you're in supplier relationship management, it's a good practice to follow all your suppliers on Twitter, and have pre-built searches for those suppliers," Gonzalez says. A rash of complaints from people who have just been laid off could indicate problems in your supplier's business, telling you it's time to start searching for a backup source.

Getting Buzzed

Some companies are also trying to mine public social networks for data to support "sentiment analysis," Gonzalez says. "Is this product creating a lot of buzz? Are people talking about it?" The chatter on social media could prove useful in a demand planning exercise.

Supply chain and logistics executives want to make smarter decisions faster. "There are ways to leverage the speed of information that gets communicated via social networks that can have an impact on your supply chain operations," Gonzalez says.

If you have ever seen a video or meme go viral, you understand how quickly information can travel on social media. This force has changed the way many of us conduct our personal lives, and it also holds powerful promise for the way we manage our supply chains. ■

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Inc. 5000

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- Expedited
- FTL Freight
- 3PL
- Warehousing
- Drayage

SUPPORTED EDI

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- 990: Response to Load Tender
- 214: Transportation Carrier Shipment Status
- 210: Freight Bill Invoicing
- 997: Functional Acknowledgement

INDUSTRIES

- Agriculture
- Food & Beverage
- Automotive
- Gvmt. & Non-Profit
- Electronics
- Manufacturing
- Consumer Goods
- Transporation
- Retail
- Paper
- Pet Food
- Energy
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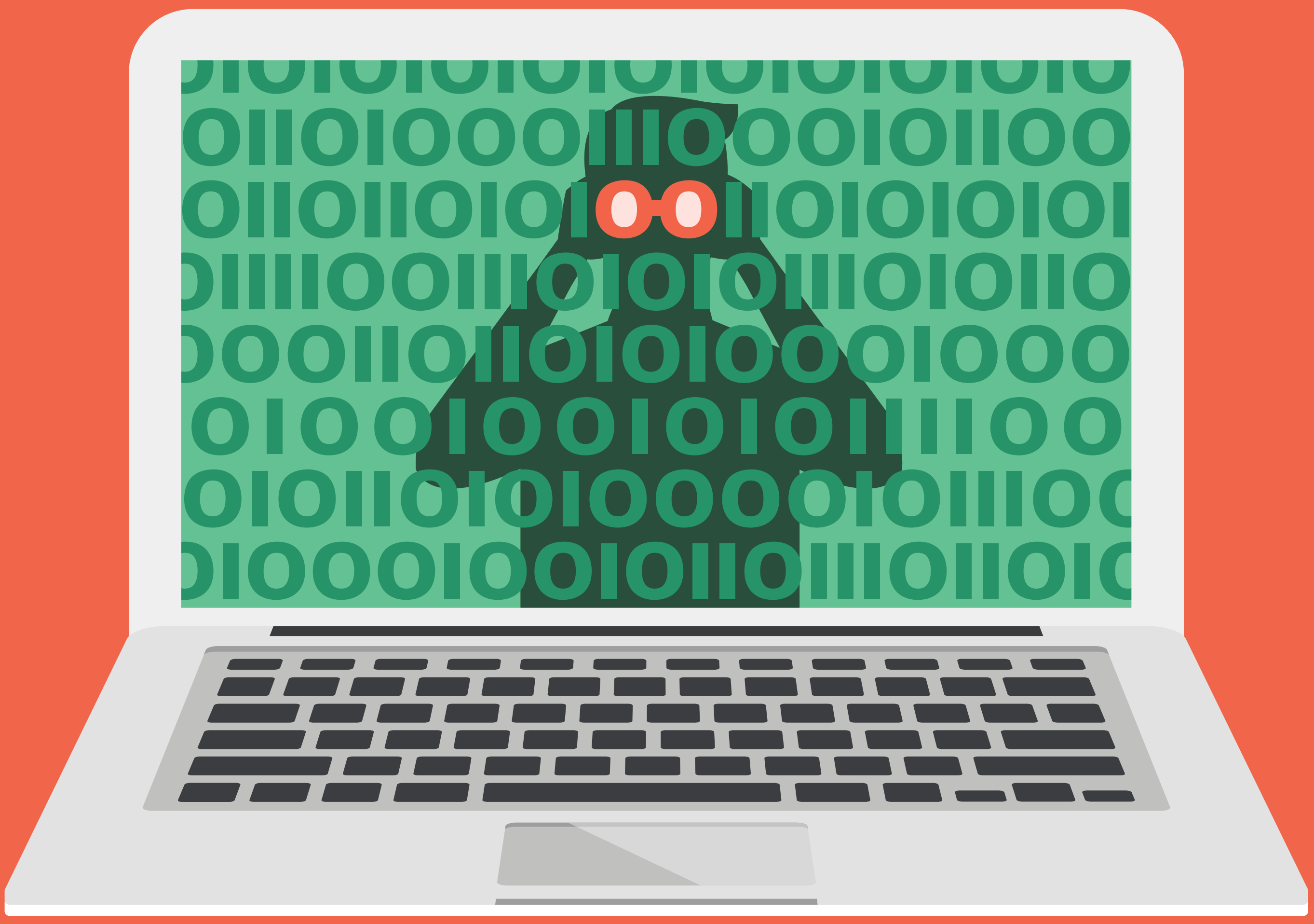
Returning to the Screen of the Crime

By Norman Schreiber



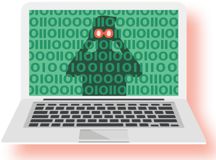
WHAT YOU NEED TO KNOW AND DO TO PROTECT YOUR CYBER SUPPLY CHAIN.

Your IT network is a thing of beauty. It enables, advises, analyzes, records, tracks, and connects. It even does Windows. To criminals, however, your network is a safe waiting to be cracked.

"Cyber crime costs the global economy more than $400 billion each year, and those costs will continue to grow," reports PricewaterhouseCoopers. And, 2014 saw nearly 80,000 suspicious security incidents, according to Verizon Enterprise Services. Of these, more than 2,000 were confirmed data breaches.

"Hardly a day goes by without a major company reporting an attempted breach of its systems," writes Chris Blackhurst in the *London Evening Standard*. He invokes the IRA's response to its failed attempt at assassinating Margaret Thatcher: "Today we were unlucky, but we only have to be lucky once. You'll have to be lucky always."

A few notable data breach victims include large companies such as Sony, The UPS Store, Anthem, Home Depot, T-Mobile, Citroen, and Target. But cyber burglars break into smaller enterprises, too. For example, criminals recently uncorked customers' personal data at several California wineries.



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The bad guys find a vulnerability — an exploitable software, system, defense, or human flaw. The same way street burglars check windows and doors to find an unlocked, easy entrance, cyber burglars use malware to poke around for a weakness until it finds an easy-to-penetrate network — and gains access.

"Access to a system does not imply that criminals can log in," explains Gregory D. Tomczyk, director of global service strategy and design for supply chain management company UTi Worldwide. "Access is being able to exploit a weakness or vulnerability to execute a criminal's intent."

Hackers on a mission can find and exploit the flaw by planting a worm, a virus, or some form of malware. Don't overlook someone physically inserting an infected USB stick into a network-connected computer, or an employee opening an email phishing link that may introduce malware.

Stealing More Than Just Data

What data are criminals hijacking? Customer and personnel records offering a bonanza of exploitable personal information: credit card numbers; login information (ID and password); Social Security numbers; passport and driver's license numbers; and birthdates.

But wait, there's more. They are also hijacking companies' proprietary information: correspondence, contracts, intellectual property, customer lists, vendor prices, warehouse CCTV videos, and trade secrets. The enemies are global. Motives range from theft to extortion to competitive spying to doing it just for fun.

Don't think of customer information as just data. That's so impersonal. Instead, think of each record as a lawsuit and an angry ex-customer. It's the kind of thing that keeps IT security professionals up at night.

The supply chain was Ground Zero for both the Target and Home Depot break-in attacks, said Dr. Sandor Boyson research professor and co-director of the Supply Chain Management Center at the University of Maryland's Robert H. Smith School of Business, in a *Washington Post* article.

And that is the scary truth for supply chain professionals. The vulnerability might not be in your internal network. One or more of your suppliers or carriers might be lax on security. If your networks are connected, as they probably are, you are out of luck. About 70 percent of malware that successfully penetrates one system migrates to a connected system, often in less than two hours, according to Verizon.

Target fell victim to a security breach caused by a sometimes overlooked weakness in corporate cyber security: third-party network connections that create a virtual back door to customer information.

The T-Mobile thieves broke in through Experian, which processes applications for the communications company. Target became a bulls-eye because cyber thieves discovered a vulnerability at one of its third-party vendors, a Pennsylvania-based heating and air conditioning contractor. Burglars ransacked Citroen after gaining entry through a third-party vendor that offered Citroen-branded items.

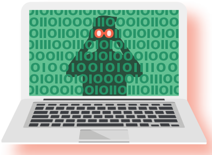
Add to this the Internet of Things (IoT), where machines talk to machines. Refrigerators order food from a delivery service; smart teakettles turn themselves on; warehouses tell the factory to make more widgets. The IoT adds more data, more sources of data, and more leaky networks to the universe.

The IoT poses a particular threat to logistics and transportation, especially because hackers are not always looking to get in, snatch, and go, says Jeffrey Luft, global practice leader for Verizon Enterprise Solutions' transportation and distribution verticals.

Hackers might be "looking to take a criminal action down the road," Luft adds. "That would include things like knowing the inventory location of either a distribution center or retail store; or knowing the inbound cargo on containers coming into the West Coast ports and planning criminal activity around that."

"The IoT will be largely useless unless it is an Internet of Secure Things," writes John Villasenor, nonresident senior fellow, governance studies, Center for Technology Innovation in *Forbes*.

"Suddenly, there's a big light shining on supply chain information, where there might have been a dim candle looking at it from a protection and security perspective in the past," says Harold B. Friedman, senior vice president of global corporate



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development for Data2Logistics, a supply chain finance third-party logistics provider.

The good news is that more robust defensive tools are now available.

"Firewalls are getting bigger and better," says Joan Ross, managing principal with Verizon Enterprise Solutions' cybersecurity practice. "Intrusion detection is getting more sensitive, and finely tuned."

Only 10 of 2014's more than 7 million exploited vulnerabilities accounted for 97 percent of the year's incidents, according to Verizon. Most vulnerabilities dated back to 2007, and could have been sidestepped with an available patch.

The better news is that protection is not as much about the latest technology as it is about how you think, prepare, and act.

"There are three phases of attack," said Ellen Richey, chief enterprise risk officer for Visa Inc., at the *Washington Post's* 2015 Cybersecurity Summit. "First is the entry point; second is the theft or destruction therein, third is the monetization of the data.

"The entry point is generally not at all sophisticated," she added. "Thieves gain access through simple things, such as default passwords, or a failure to control administrative privileges. Companies can do lots of things to protect themselves through basic cyber hygiene."

Was it an Inside Job? Survey Rates the Impact

Many insider incidents* result from employee vulnerabilities such as social engineering and loss of devices, which training can mitigate. Companies can also prevent insider incidents by monitoring employees for negative behaviors such as violation of IT policies, disruptive behavior, and poor performance reviews.

Most adverse consequences	11% Loss of confidential /proprietary data	11% Reputational harm	8% Critical system disruption
Mechanisms used	21% Social engineering	18% Laptops	17% Remote access
Characteristics displayed	27% Violation of IT security policies	18% Misuse of organization's resources	10% Disruptive workplace behavior
Reasons for committing cybercrime	16% Financial gain	12% Curiosity	10% Revenge

**A current or former employee, service provider, authorized user of internal systems, or contractor*

Source: PwC, U.S. State of Cybercrime Survey

So, what is a supply chain professional to do?

In recent years, a logical concept has gained traction — the "cyber supply chain." Yes, movement of data through various connected networks does support the movement of products. But that same movable beast is an entity unto itself. A data breach of the supply chain is really a breach of the data supply chain.

The Cyber Supply Chain: Assessing Your Risk

How safe is your supply chain data? A University of Maryland Robert H. Smith Business School website can help answer that question. It provides guidelines to measure and assess cyber supply chain risk based on, and part of, ongoing research, and is funded by the National Institute of Standards and Technology.

The research findings "identify cyber security framework and associated supply chain risk management's practice guidelines," according to Dr. Sandor Boyson, director of the Supply Chain Management Center, and research professor at the Robert H. Smith School of Business.

"Users take a series of assessments," explains Boyson. "The site helps analyze IT systems, supply chain systems, and insurability systems. It also offers an executive dashboard that explains the results and how they compare with other companies."

It takes 30 to 40 minutes to complete each assessment. Because the assessments are interdisciplinary, it helps to have members of the IT, supply chain, and risk management departments available to help answer questions. The insurance assessment section might be of particular interest to publicly traded companies.

To take the completely anonymized assessment go to: https://cyberchain.rhsmith.umd.edu


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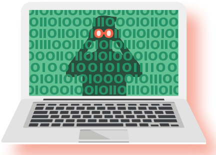

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Globalization and outsourcing of software and hardware brought "a process of decomposing and fragmenting the IT chain, similar to what happened to the product supply chain in the 1990s," explains Boyson.

Now, he adds, we need "an integrated governance structure that provides control, just as you have with the product supply chain." An early advocate of this principle, Boyson says the supply chain, risk management, C-suite, and IT positions need to collaborate.

"Senior executives and board members are increasingly being held accountable for their preparedness, as well as their response," said attorney Judith Germano of Montclair, N.J.-based Gemano Law, at the *Washington Post* summit.

Some deep planning is necessary. It starts with a detailed review of your cyber supply chain. How is your data being used? Who is using it? Why is it being used? These are not supply chain-specific questions, but your answers are.

For example, can you identify all your vendors? Not knowing all your vendors is the same as not knowing who has access to your system. In fact, 10 percent of survey participants in a Business Continuity Institute study prepared for Zurich Insurance did not know all their vendors.

"Developing and implementing a master framework requires participation from leadership decision makers down to individual contributors on a warehouse floor," says UTi's Tomczyk.

"Carriers should assert requirements on what they need to do in order to conduct business," he adds. "What data? With whom do they interact? How will they communicate? Who has access to what?"

Supply chain and logistics pose complex data security challenges. "Requirements can change from country to country, and from region to region," Tomczyk says. "And, a supply chain company's business function is to make as much data as possible visible to its customers — while preventing unauthorized access to that same information."

Securing a Third-Party Partner

Security is a specialty unto itself. Not all IT professionals are security whizzes.

"If security falls outside the core competency of the team, do the executives partner with a qualified third party to ensure due diligence of security for their employees, customers, partners, and intellectual property/shareholders?" adds Verizon's Ross.

"Technology subject matter experts can design systems and controls to provide risk mitigation while allowing the business to function," says Tomczyk.

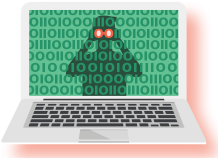
"The more critical the data, the more security layers or controls surround and protect it," he adds. "Defense in depth is a design concept where the most critical business data or systems are structured the farthest away from ingress points, and have the most layers to penetrate."

Battling cyber supply chain security is a never-ending story of implementation, training, modifying, and staying in touch with a fluid landscape. Here are some tips for staying on top of it:

- **Keep track of personnel changes.** Employees and vendors share something in common: They change. They move on, move up, or move out. Access privileges have to be modified. Someone whose role requires access to the finance system may move to a marketing role. "At that point," says Ross, "access to the finance system needs to be revoked."
- **Monitor your trading partners' security systems periodically.** "This helps you know exactly who is logging on to your network, with what valid accounts and privileges, and through what applications at all times," says Ross.
- **Have a security protocol in place that extends to the IoT.** "Distribution centers tend to stock small, valuable items in a cage controlled by card swipe, keypad, or an actual key," says Jeffrey. The IoT lets you monitor how often that cage door opens and closes. Correlate the cage door's openings with the number of orders picked for a specific period of time. Do you detect a significant difference?

That difference "should raise a red flag," says Luft. "Why was the door opened? Who opened it? Did they have access and why were they in that area of the facility? If monitored consistently, the IoT makes a good security tool."

While most companies take precautions to secure their distribution center's physical assets, many overlook the importance of protecting supply chain data.



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DO's and DON'Ts of Cyber Security

Computer security awareness is not just for your IT department; it's for everyone. Here are a few do's and don'ts.

- **Think before you click.** Sometimes scamming messages can look legit. But there are a few tests you can do before you open it. "Hover your mouse over the top of the URL," says Brian Posey, TechRepublic. "You'll see the true hyperlinked address, which should be the same as the displayed address. Also beware of misspelled domain names, requests for personal information, or anything that just doesn't look right. It probably isn't."
- **Keep your office computer locked whenever you step away.** Phones and laptops get lost or stolen; so keep them locked. They tend to hold sensitive company information such as emails, texts, files, etc. (Translation: I trust you but I don't trust the person who entered your cubicle when you went to the restroom or the one sitting next to you in Starbucks.)
- **Don't use apps without IT's knowledge, approval, and support.** The shadow app might be a Trojan horse of another color. Use your computer for work. Don't browse sites.
- **Inform your designated security contact.** If you suspect your company is being targeted, or your computer is acting up—running too slow, displaying strange error messages, or having an unusual response to keystrokes—report it.

Suppose, despite your best intentions, your supply chain data falls victim to a breach. When an intrusion warning appears, IT security people don't panic. They spring into action like the first responders they are.

"IT security professionals have a field general mentality about any event where experience, training, and instinct take over," says Tomczyk. "When an event occurs, they know they have the technology, processes, and people controls in place, and they can effectively respond."

Addressing a security breach starts with identification and tactical remediation. "Close the exploit and vulnerability, and continue forward with impact assessments, analysis, and communications," says Tomczyk.

"Make sure everyone in your company knows their roles," adds Ross. "You might become the incident commander, and brief your corporate executives. You also might have to brief marketing, who is talking to the media.

"Have staff in certain roles report to you every 30 minutes for the first several hours of the breach until you get a handle on it," Ross adds. "They have information coming in, and that helps you hone your guidance and direction."

Handling Breaches Like a Boss

Consider how The UPS Store Inc. handled a security breach in 2014 when it experienced a malware intrusion at 51 locations in 24 states; about 1 percent of 4,500 franchised center locations throughout the United States.

The UPS Store responded swiftly. It hired external forensic experts to launch an investigation and eliminated the threat from the 51 center locations. The UPS Store implemented additional security enhancements, and offered identity protection and credit monitoring services at no charge for one year to any customer whose credit or debit card information may have been exposed at one of the impacted center locations.

Since the incident, The UPS Store has improved its data security initiatives to incorporate the latest technologies and industry best practices to protect customer data.

After Target's data breach was discovered in 2013, affecting 70 million to 110 million customers, the big box chain offered one year of free credit monitoring and identity theft protection to all its U.S. shoppers. In mid-March 2015, Target received preliminary approval to settle a class action lawsuit for $10 million and a maximum (but not likely) payout of $10,000 to individual claimants, according to the *New York Times*.

Playing Defense

To save your company from going through this ordeal, it pays to keep the proverbial barn door closed in the first place so that no or minimal damage takes place. "A good defense beats a good offense," says Friedman.

You and your supply chain partners need to become security fanatics. That means implementing a strong defense and using trusted third-party vendors and transportation partners. It means keeping up with compliance standards, acquiring necessary certifications, and staying alert.

The contracts you sign with vendors and carriers might state "that you have a right to audit them, to inspect how they are ensuring security, to do some form of due diligence confirming that they have security controls in place," suggest Ross.

Increasingly, companies are turning to third-party IT security specialists. If nothing else, these relationships maintain continuity of protection while in-house IT staff move on to other roles.

We may see cyber supply chain criminals as a marauding band of genius outsiders, or chess masters gone wrong, and view the battlefield as a techno contest complete with its own arms race. But you can protect your company's supply chain data by staying alert and planning ahead. ■

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ARE MANUFACTURERS READY TO RESHORE?

THE ANSWER IS YES… AND NO.

BY VICKI SPEED

We have all heard the talk about the possibility of a manufacturing revitalization in the United States. While it is happening in some sectors, the chances of a wholesale national shift occurring are more rhetoric than reality in the current market.

"More accurately, corporate executives are adopting a carefully considered production flow strategy," says Morris Cohen, professor of manufacturing and logistics in the Operations, Information and Decisions Department, University of Pennsylvania's Wharton School. "Companies are strategically shifting manufacturing centers for a variety of reasons, including easier access to current or emerging markets and to sources of innovation."

In most cases, the reshoring decision is less about the cost of labor to manufacture and produce goods and products, and more about the overall total cost, which includes strategic assessments about supply chain risk, logistics, customer proximity, quality, and many other factors. Manufacturers are evaluating tradeoffs that affect their global performance through their impact on local performance metrics, such as the landed cost for each product in each market in a way that accounts for current market conditions, technology trends, supply availability, and competitive factors.

"We're focused on shaping an integrated supply chain solution and the intelligent optimized flow of goods from the manufacturing facility to warehouses, distribution centers, and customers," confirms Frank Guenzerodt, president and CEO of Dachser USA, a global logistics service provider. "That includes all aspects of product supply or raw materials across the entire supply chain, not just transportation."

A greater emphasis on supply chain management strategies at the executive level has changed the manufacturing market, according to Rosemary Coates, executive director of the Reshoring Institute, a group that provides research and support for companies bringing manufacturing jobs and services back to America.

"The decision to reshore, nearshore, or offshore manufacturing is more thoughtful today than it was 10 to 15 years ago," she says. "In the past, many decisions were knee-jerk reactions to competitor actions; there was little evidence that various incentives were carefully considered. Today, executive leaders are analyzing and measuring the tradeoffs much more carefully."

Here's a summary look at the "production flow" that is occurring across the global manufacturing market, and how it affects reshoring in the United States.

Rebuilding the U.S. Middle Class

In 2014, 60,000 manufacturing jobs were added in the United States, compared to 12,000 in 2003, as a result of reshoring (American companies returning to the United States) or through direct foreign investment (foreign companies moving production to the United States), according to the Reshoring Initiative, a non-profit organization founded in 2010. The net increase of at least 10,000 jobs in 2014 was the first net gain in at least 20 years. In contrast, as many as 50,000 jobs were offshored last year, a decline from about 150,000 in 2003, the organization reports.

> "With the availability of low-cost energy in the form of natural gas in North America, the manufacturing tide is turning."
>
> – **Glenn Riggs,** Senior Vice President of Corporate Logistics and Strategy, Odyssey Logistics & Technology Corp.

"These numbers likely reflect the evolving supply chain strategies that manufacturers in the United States, as well as foreign companies, are putting to work," says Coates. "For some U.S. manufacturers, economic patriotism will be a tipping point as to whether or not to reshore. Executives recognize that over the past 15 years, we put a giant hole in the middle class. We have to fix that because it's not a sustainable economic profile in the long term."

Walmart is doing its part to develop a stronger manufacturing base by pledging to purchase approximately $250 billion in U.S.-made products by 2023.

"Walmart's U.S. manufacturing initiative is particularly significant, primarily because of the company's sphere of influence," explains Coates. "Walmart is the mother of all supply chains. The company influences virtually every part of the manufacturing industry. As a result of Walmart's initiative, plastics, small motors, apparel, and other products are coming back. Rebuilding these industrial sectors will have a magnifier effect across all kinds of American manufacturing—and we know that Walmart is a retail trend-setter that other retailers are sure to follow."

Walmart U.S. President and CEO Greg Foran addresses attendees at the 2015 U.S. Manufacturing Summit, where goods producers pitch American-made products to the retail giant.

As a result of Walmart's pledge, a number of companies have expanded

manufacturing operations in recent years. In 2015, Bell Sports brought its bike helmet production back to the United States. The firm now sells 100-percent Made in the USA helmets at Walmart.

Other examples include the new K'nex line of K-Force Build and Blast toys, which are molded by its Hatfield, Pa.-based injection molding company, Rodon Group LLC. General Electric (GE) opened three factories in Mattoon, Ill., and Circleville and Bucyrus, Ohio, to manufacture GE energy efficient soft white bulbs that are sold exclusively at U.S.-based Walmart stores. And Giti Tires established a facility in Chester County, S.C., to produce tires for Walmart.

Some manufacturers are able to overcome labor disparities with help from federal and state government incentive programs. One example is the U.S. Department of Commerce Economic Development Administration's (EDA) $2 million grant to the Brooklyn Navy Yard Development Corporation (BNYDC) to create space for manufacturers and startups. With EDA's investment, BNYDC will renovate 250,000 square feet of space in Building 77 at the Brooklyn Navy Yard into industrial suites for new and growing green manufacturing companies.

In 2015, Peoria, Ill.-based Caterpillar announced plans to begin independently manufacturing vocational trucks in Victoria, Texas. Caterpillar launched its first vocational truck, the CT660, in the North American market in 2011. It has since added two more models — the CT680 and CT681 — to the lineup. To date, Caterpillar has worked with Navistar for the products' design and build, which are currently manufactured in Escobedo, Mexico. Production of the truck is set to begin in Victoria in 2016.

Another example is Todd Shelton, a men's clothing manufacturer, which is reshoring production back to the United States from Japan. The company has balanced high labor and fixed costs with improved product quality, increased innovation, and greatly reduced lead times since it began manufacturing in-house, according to an in-depth report prepared by the Reshoring Institute.

Automakers Drive Back

Several auto manufacturers are also moving production to U.S. soil, demonstrating Cohen's "manufacturing production flow" scenario that has begun to emerge across the global manufacturing industry.

For instance, Ford is moving medium-duty F-650 and F-750 commercial truck manufacturing operations from Mexico back to the United States, in Avon Lake, Ohio — a first for the company in the way of reshoring. The announcement is tempered by the move of Ford's Focus and C-Max cars from a plant in Wayne, Mich., to Mexico. "We are committed to leveraging our global manufacturing footprint and will continue to invest where it makes the best sense for our business," says Karl Henkel, a Ford spokesman.

Several other notable manufacturers have brought some production back to the United States, including GE's reshoring of appliances from China to Kentucky and Motorola's smartphone from China to Texas.

Global logistics provider Dachser recently began operating under a new trade name in the U.S. market – Dachser USA Air & Sea Logistics Inc. – to better reflect the important role U.S. business plays in its growth.

A Chemical Reaction

The chemical manufacturing industry is in the midst of a production shift as well. "In the chemical industry, it's all about energy prices right now," says Glenn Riggs, senior vice president of corporate logistics and strategy for Odyssey Logistics & Technology Corporation (Odyssey), a global logistics solutions provider.

"In the past, chemical manufacturers typically outsourced production to take advantage of low energy and labor costs," he adds. "With the availability of low-cost energy in the form of natural gas in North America, the manufacturing tide is turning."

Companies announced 246 projects worth $153 billion in potential capital investment as of September 2015, according to the American Chemistry Council (ACC). That's an increase of 97 projects and $72 billion from March 2013. By 2023, the study notes, additional output from $153 billion in capital investment will generate $113 billion per year in new chemical industry shipments.

Why is this important? Because chemical products such as PVC, vinyl chloride, ethylene glycol, styrene, and polystyrene

Airbus recently inaugurated operations at its first U.S. manufacturing facility in Mobile, Ala. The plant assembles the A319, A320, and A321 aircraft models.

are key to the manufacture of a vast range of products from food packaging to footwear, tires to trash bags. Interestingly, firms based outside the United States initiate more than 60 percent of the capital projects, according to the ACC study.

"Low energy prices have sparked foreign investment in U.S.-based chemical manufacturing, as a way to develop a reliable, regional supply chain for production with excess for export," Riggs adds.

Foreign Companies Outsource to the United States

For European companies, North America represents a lower-cost and lower-risk manufacturing alternative to production at home, according to Cohen's study. It also provides much-needed proximity to their customer base.

Germany-based Airbus is one example. The company recently opened its first manufacturing facility in Mobile, Ala. Airbus expects to deliver the first U.S.-made Airbus A321 commercial aircraft in spring 2016. By 2018, the facility will produce between 40 and 50 single-aisle aircraft per year.

"With the addition of our U.S. facility to our production network in Europe and Asia, we have strategically expanded our worldwide industrial base," says Airbus President and CEO Fabrice Brégier. "It enables us to grow our already significant presence in America — the largest single-aisle aircraft market in the world — and to be closer to U.S. customers and key supplier partners."

> "The problem with setting up manufacturing in Mexico is that it won't help rebuild the U.S. manufacturing economy."
>
> – **Rosemary Coates,** Executive Director, The Reshoring Institute

In addition to the new Alabama manufacturing site, Airbus assembles commercial aircraft at modern facilities in Hamburg, Germany; Tianjin, China; and Toulouse, France. The company traditionally builds its A320-type planes in Hamburg and Toulouse. It opened a site similar to the Mobile final assembly line in Tianjin in 2008.

Similarly, Innovate Manufacturing, a China-based company, renovated a 30,000-square-foot building to support injection molding operations in Knoxville, Tenn. — the first U.S.-based facility for the company. Mexico-based Nutec Group, a producer of high-temperature insulation fibers used in the fire protection, metal, glass, automotive, and petroleum industries, is also building its first U.S.-based advanced manufacturing facility in Huntersville, N.C.

"We chose North Carolina for its utility and transportation advantages, and the state contains an exceptional workforce," said Gerardo Muraira, operations director for Nutec, in a press announcement. "In addition, we can service our customer base quicker, and provide more cost-effective transportation."

The Fit and Fix of Nearshoring

From automobiles to medical devices, Mexico is fast becoming the manufacturing mecca for companies looking to gain closer access to customers in the Americas.

"We're seeing considerably more nearshoring activities, as opposed to reshoring," confirms Dachser's Guenzerodt. "Much of that trend originates from Asia's disappearing labor cost advantage as compared to areas such as Mexico, which brings some U.S. manufacturers closer to their primary consumer."

Thanks in large part to the North American Free Trade Agreement, Mexico offers U.S. and foreign manufacturers many of China's low labor benefits, combined with proximity and lower risk.

One of the biggest growth areas has been in the automotive industry. Mexico produced 292,271 vehicles and exported 234,668 autos in August 2015, according to the Mexican Automotive Industry Association. Nearly every automaker, both U.S. and foreign, is adding manufacturing capabilities in Mexico.

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For instance, Daimler and the Renault-Nissan Alliance are building a plant in Aguascalientes in central Mexico to produce next-generation premium compact vehicles from Mercedes-Benz and Infiniti. The new plant will have an initial annual production capacity of more than 230,000 vehicles, with the first vehicle rolling off the assembly line in 2017.

Audi is currently building its first plant in Mexico, which will provide the automaker with its first North American manufacturing capacity by the end of 2016. Italian tire company Pirelli opened its first manufacturing plant in Mexico several years ago to meet demand in the Americas. The company projects that the plant will produce 5.5 million tire units by 2017.

Autoneum Holding AG, a provider of acoustic and thermal management solutions for vehicles, has begun construction of a new plant in San Luis Potosi, Mexico. The decisive factor behind the expansion of its production capacities in Mexico is the prevailing high demand from international automobile manufacturers for lightweight and multifunctional components. Mando is building a new auto parts manufacturing plant in Arteaga City, Mexico, which will begin operation in 2017. The company's supply networks range from Volkswagen, Honda, and Mazda to Kia, GM, and Ford.

The Rest of the Story

While automobiles and parts make up a large part of Mexico's manufacturing production growth, they are only part of the story. In Guaymas, Mexico, Chromalloy built a new gas turbine engine machining facility for aircraft engine components. Zenith Electronics Corporation has plans to discontinue sourcing picture tubes for projection TV sets in the Far East and begin manufacturing them in Mexico.

The already strong medical manufacturing sector in Mexico is also expected to continue growing. Currently, Mexico exports a majority of its manufactured medical devices to the United States and Canada.

While nearshoring will continue to happen given the technical capabilities and low labor costs in Mexico, it will do little to solve the U.S. manufacturing market, Coates argues.

"We love it when companies rationalize their manufacturing to the continent where they are going to sell their products," she notes. "But the problem with locating in Mexico is that it's not America. Setting up manufacturing in Mexico won't help rebuild the U.S. manufacturing economy."

Many industry analysts agree that wholesale manufacturing reshoring in the United States is unlikely, though they look optimistically at today's more balanced growth.

"Companies are applying the concept of total cost of ownership and supply chain risk and complexity in far more strategic ways," says Joel Sutherland, managing director with the Supply Chain Management Institute, School of Business Administration at the University of San Diego, and host of the Reshoring Institute. "These factors are often somewhat intangible with hidden costs, such as corruption or the loss of intellectual property."

Still, the primary reason for putting a manufacturing plant in a particular location is likely proximity to existing or emerging consumer markets. China, for example, offers one of the largest consumer markets in the world—so it makes sense to produce in China for their local market. The question is whether it makes sense to produce in China for another market such as the United States.

In 2016, Caterpillar will begin independently manufacturing vocational trucks—including this CT680 model—in Victoria, Texas. It currently manufactures the trucks in Escobedo, Mexico.

"We live in a just-in-time delivery world," says Sutherland. "Business success depends on an effective supply chain system that considers multiple factors including wage rates, skilled labor availability, production costs, government regulations, economic stability, controlled risks, and much more."

As manufacturers continue to refine their production flow strategies based on comprehensive supply chain management analysis, expect to see some continued reshoring of manufacturing in the United States, though likely not the wholesale return that some might hype. ■


E-COMMERCE
TRANSPORTATION MODES
OMNI-CHANNEL
FULFILLMENT
TRANSPORT

The Science Behind SITE SELECTION

Industry leaders test their theories about new distribution and fulfillment center locations, and – Eureka! – discover the elements of successful site selection decisions.

BY CHRIS LEWIS

When it's time to choose new distribution, fulfillment, and e-fulfillment center locations and expansions, there is no magic formula. Whether their organizations are looking to decrease drayage and transportation costs, gain access to multiple transportation nodes and modes, lower drivers' total mileage, or boost labor forces, site selectors must experiment with a variety of elements before purchasing new facilities or further developing current operations.

Site selection—and expansion—is truly a science, no matter what the company's primary goal. What are industry leaders doing to ensure their new sites and expansions improve their supply chains, resulting in long-term growth and success? And, how should logistics professionals respond in 2016 and beyond?

To understand the reasoning behind their site location and expansion decisions, and to solicit a broad spectrum of ideas and opinions, *Inbound Logistics* spoke to four companies in three separate industries: two industrial real estate developers, an automotive parts manufacturer, and a globally renowned, upscale fashion retailer. Each organization reveals the factors influencing their site selection processes, as well as the results achieved with their new locations or expansions.

E-COMMERCE AND OMNI-CHANNEL RETAILING IMPACT SITE SELECTION DECISIONS

In 2014, e-commerce drove approximately 30 percent of U.S. demand for industrial real estate, according to CBRE, a Los Angeles-based commercial real estate services firm. To compare, e-commerce transactions made up only 7.5 percent of the nation's retail sales during that same timeframe.

"The 30 percent also includes omni-channel companies that are responding to competitive pressures and, as a result, are re-thinking and re-working their supply chains to remain competitive," says Douglas A. Kiersey Jr., president of Dermody Properties, an industrial real estate developer headquartered in Reno, Nev.

The combination of e-commerce and omni-channel retailing has significantly impacted the industrial real estate industry, especially in recent years, leading to considerable growth in distribution markets.

"To serve this growing segment, we had to rethink the design of our facilities to meet the significant differences in what companies need today compared to five years ago," Kiersey says. "Many companies have specific requirements, and they cannot choose a distribution or e-fulfillment center that does not quite fit those needs simply because it is available."

"Many companies have specific requirements, and they cannot choose a distribution or e-fulfillment center that does not quite fit those needs simply because it is available."

–**Douglas A. Kiersey Jr.,** President, Dermody Properties

Dermody Properties constructed this three-building, master-planned industrial park in Reno, Nev. The first facility was fully leased to Amazon in 2014. The company recently completed the other two facilities, which total 402,320 and 224,640 square feet.

E-commerce and omni-channel company requirements are diverse, ranging from distribution centers with higher electrical power capacity to additional automobile and trailer parking. In fact, e-commerce and omni-channel companies need at least one parking spot for every 1,000 square feet of warehouse space, whereas traditional distribution companies require only one parking spot per 3,000 to 4,000 square feet of warehouse space, according to Kiersey.

In addition to needing higher electrical power capacity, e-commerce and omni-channel companies favor facilities that are fully air conditioned because they tend to have more employees than traditional distributors. They also often prefer more clear height in their buildings, along with greater weight capacity on their roofs. They may even require double inbound lanes with controlled access into secure truck docks to meet security requirements.

"We have to anticipate where these companies will need space—and what features their distribution centers must have—so that the facility is there when they are ready," says Kiersey. "There is often not enough time for a true build-to-suit." Dermody Properties builds on a speculative basis in addition to build-to-suit, so that distribution centers are available when and where their customers need them.

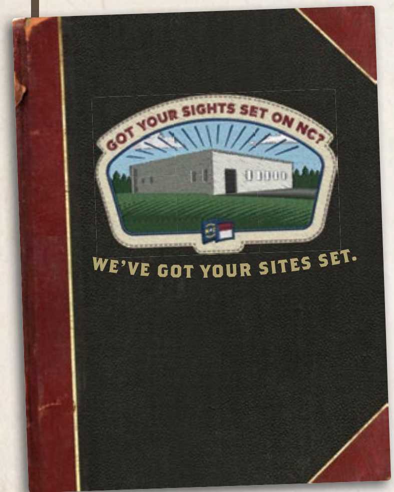
Build-to-suit, however, is the only option for some companies. For them, Dermody Properties finds a site, and then designs and constructs a facility that meets their exact needs.

"The cost of the real estate itself is secondary to other supply chain costs, such as labor and transportation—the top costs companies consider when choosing a site," Kiersey explains. "They want locations that place a high percentage of their U.S. customers within a 500-mile radius—a one-day truck drive—of their facilities."

In the past two years, Dermody Properties has developed industrial facilities in Chicago, the Cincinnati/northern Kentucky market, Las Vegas, Louisville, Ky., New Jersey, central Pennsylvania, Pennsylvania's Lehigh Valley, Portland, and Reno, Nev.—locations from which companies can quickly reach major population centers.

Beyond e-commerce and omni-channel companies, Dermody Properties also serves traditional distribution companies. After all, traditional distribution is expected to grow at approximately the same rate as the national GDP for years to come, according to Kiersey.

To stand out from the competition, Dermody Properties focuses on in-fill properties—areas that have extremely high barriers to entry for development, such as when land is scarce enough that



THERE'S NO DENYING IT: NORTH CAROLINA IS A GREAT PLACE TO DO BUSINESS.

In fact, *Site Selection* magazine ranked North Carolina 2nd in its annual Top Business Climate survey for 2013. The state also came in at #4 on *Forbes* Best States for Business 2013 rankings. Safe to say that when it comes to business, North Carolina is where it's at!

So if you're looking at NC (and you should be), let ElectriCities of North Carolina's Economic Development team illuminate the way. We represent more than 70 NC Public Power communities across the Tar Heel state. Plus, we're well-heeled with homegrown information, industry expertise and economic incentives to help you reach your goals.

Got your sights set on NC? We've not only got the vision—we've got the sites, too. See for yourself...

CONCORD

International Crossing Business Park
Location (Under Construction)
Building size: 277,253 s.f. Build-to-suit office space
Ceiling height: 32' clear height
Sprinkler: ESFR Sprinkler System
Dock doors: 70 dock doors with 10 knock-outs
Trailer: Storage onsite
Depth: 240'
Column spacing: 45' typical
Doors: Two drive-in

KINSTON

Highway 70 West Industrial Park
Location: 2010 Smithfield Way, Kinston, NC 28504
Building size: 40,000 s.f. expandable to 160,000 s.f.
Year built: 2009
Acreage: 9 acres with additional 8 acres available
Ceiling height: 30 feet
Dock doors: 2 dock-high, 1 drive-in
Flooring: 10 mil vapor barrier

MONROE

Monroe Corporate Center
Location: 447 Goldmine Rd., Monroe, NC 28110
Building size: 102,000 s.f.
Year built: 2013
Ceiling height: 30 feet clear
Dock doors: 4 dock-high, 1 drive-in
Flooring: Stone

CONCORD

International Business Park
Location: 4541 Enterprise Dr., Concord, NC 28027
Building size: 88,527 s.f. expandable up to 141,000 s.f.
Year built: 2011
Acreage: 12.8 acres
Ceiling height: 28 feet
Dock doors: 4

CONCORD

Concord Airport Business Park
Location: 7055 Northwinds Dr., Concord, NC 28027
Building size: 150,000 s.f.
Year built: under construction
Ceiling height: 32 feet clear
Dock doors: 20-30 side loading
Flooring: 6 inch concrete
Adjacent to Concord Regional Airport

SHELBY

Foothills Commerce Center
Location: 1001 Partnership Drive Shelby NC 28152
Building size: 100,000 s.f. expandable to 200,000 s.f.
Year built: 2013
Ceiling height: 30 feet
Rail: .56 miles
Walls: Structural precast concrete
100% ESFR

CONCORD

Concord Airport Business Park
Location: 7035 Northwinds Dr., Concord, NC 28027
Building size: 400,000 s.f.
Year built: under construction
Ceiling height: 36 feet
Dock doors: 40-80 side loading
Flooring: 6 inch concrete
Adjacent to Concord Regional Airport

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BRENDA DANIELS
Manager, Economic Development
800.768.7697, ext. 6363
bdaniels@electricities.org

ELECTRICITIES of NORTH CAROLINA, INC.

CenterPoint Intermodal Center (CIC)-Joliet/Elwood, Ill., is the largest master-planned inland port in North America. Situated on more than 6,500 acres about 40 miles southwest of downtown Chicago, CIC-Joliet/Elwood is strategically positioned at the epicenter of the region's immense transportation infrastructure.

existing dysfunctional buildings must be torn down and replaced with new ones—in major markets.

"We have done a fair amount of redevelopment work by repurposing sites to build new projects," Kiersey says. "As we do, we ensure we are investing in markets with sustainable demand drivers, which are different in each market.

"For example, Louisville's UPS Worldport hub offers a massive infrastructure that is attractive to companies that use air freight to transport their goods," he adds. "Reno, in comparison, is ideal for ground transportation, as it sits right in the middle of 11 western states."

CLOSE PROXIMITY TO MAJOR TRANSPORT NODES MAKES A DIFFERENCE

As an industrial real estate developer based in Oak Brook, Ill., CenterPoint Properties acquires, develops, and manages distribution and manufacturing facilities near transportation nodes, focusing on port and rail infrastructure assets.

In 2001, the company opened an inland port in Elwood, Ill., a village located about 50 miles southwest of Chicago. Eight years later, it opened another port in nearby Joliet. When combined, the two ports—known as the CenterPoint Intermodal Center-Joliet/Elwood—are situated on 6,400 acres of industrial-zoned land, forming the largest inland port in North America.

In addition to its size, the CenterPoint Intermodal Center-Joliet/Elwood offers immediate access to the I-55/I-80 interchange, one of Illinois's busiest highway intersections; Elwood's BNSF Logistics Park Chicago, a 770-acre intermodal facility; the 785-acre Union Pacific-Joliet Intermodal Terminal; and the Des Plaines River, which runs through northern Illinois and southern Wisconsin.

At full build out, likely by 2025, the CenterPoint Intermodal Center-Joliet/Elwood's total dimension will measure roughly 36 million square feet. On average, the site is expanding by approximately 2 million square feet each year. To date, about 15 million square feet have been completed, and companies including Bissell, Home Depot, and Walmart have become tenants.

"Although the CenterPoint Intermodal Center-Joliet/Elwood is our primary focus of development, we have also expanded development of other CenterPoint Intermodal Centers to locations such as Suffolk, Va., a town renowned for its large port, and Savannah, Ga., a beneficial rail location," says Michael Murphy, chief development officer at CenterPoint Properties. "In the past 18 months, CenterPoint Properties has also acquired more than 6.5 million square feet of industrial facilities in Houston, helping to boost our national portfolio of owned and managed industrial properties to nearly 54 million square feet."

CenterPoint Properties helps shippers and logistics companies create profitable supply chains by locating near major transportation nodes, which reduces drayage expenses considerably.

"If logistics companies are within close proximity of a transportation node, they generally save upwards of $150 per container in dray costs alone because their employees, rather than third parties, are able to pick up all their containers," Murphy explains. "The transportation nodes also shorten shipment arrival times, so that logistics companies receive them more quickly."

Last-mile shipments, in particular, highlight the ease of shipping, as products can be delivered directly to a warehouse's intermodal facilities, and then shipped short distances to final destinations. In comparison, when containers are not shipped to transportation nodes, they need to be driven several—if not hundreds of—miles to reach their final destinations.

"Our cost advantages are heavily weighted on reducing tenants' drayage expenses, as rent is only a fraction of the dray costs they typically incur when they move high volumes of products every day," Murphy adds.

As CenterPoint Properties prepares to expand even further, it will continue to focus on other transportation nodes, including Oakland, Calif., Charleston, S.C., and Savannah, Ga. And,

From bulk warehouses to mid-size distribution and manufacturing/assembly facilities, Duke Realty delivers efficient and modern industrial spaces that meet its customers' needs.

Workers handle air cargo at Rickenbacker Global Logistics Park, an advanced international air cargo airport, rail intermodal facility, U.S. Foreign Trade Zone, and distribution hub that ensures efficient movement of goods anywhere in the world.

like Dermody Properties, the company intends to develop e-commerce distribution centers, while seeking locations that are close to its customer base as well as transportation nodes that ensure the timely and cost-effective shipment of goods.

"With e-commerce, brokerage groups and site consultants are looking at more variables than they were years ago, from expansion opportunities and population density to LEED attributes such as bus access, car parking with changing stations, and environmentally responsible building materials," Murphy says. "As the analysis of land availability and costs becomes more sophisticated, the popularity of major transportation nodes will only continue to increase."

ACCESS TO MULTIPLE TRANSPORTATION MODES

American Showa's lease on its primary warehouse facility, which it had occupied for more than six years, was due to expire at the end of December 2014. In preparation, the Sunbury, Ohio-based shock absorber and power steering developer and manufacturer began to look for alternate warehouse facilities in early 2013.

Columbus, Ohio, was one of the company's underlying choices for relocation. Not only is it within one day's drive of half the U.S. and Canadian populations, but it is also home to the 1,576-acre Rickenbacker Global Logistics Park, which features an international air cargo airport, a rail intermodal facility, a distribution hub,

> "Capable, flexible locations that allow logistics professionals to serve their clients or enterprise as conditions change are not only rare—they are also positioned to save the day when the sands shift."
>
> –**Kenny McDonald,** President and CEO, Columbus 2020

and 28 million square feet of potential development.

"Rickenbacker is also a U.S. Foreign Trade Zone, so companies can import certain merchandise without having to follow typical customs entry procedures, including import payments," says Art Makris, vice president of leasing and development for commercial real estate company Duke Realty's Columbus office. "Logistics professionals are also able to monitor and record their boundaries so that they can analyze internal and external traffic patterns, schedule shipments, and improve overall operations."

Furthermore, the park offers tenants 15-year, 100-percent real property tax abatements, the ability to receive containers that are loaded to capacity, and access to five major freeways: I-270, I-71, I-70, Highway 23, and Highway 33.

In April 2014, American Showa began construction on its new facility at Rickenbacker. Eight months later, the facility—totaling 305,000 square feet with a clear height of 33 feet—was completed and opened for business. Designed to receive ocean and domestic truckloads, it has 30 dock doors, 15 of which are capable of handling ocean containers that weigh 25 tons or less, among other amenities.

As the facility was designed, American Showa considered a variety of factors, including building, inventory, and transportation costs. The company also reviewed how receiving, putaway, retrieval, and shipping would impact operating costs.

Rickenbacker Global Logistics Park, situated on the Rickenbacker International Airport air cargo operations' property, is an ideal location for businesses of all types.


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"We wanted a facility that could minimize truck drivers' idle or waiting time, and reduce their route miles and hours," says Ron Reynolds, general manager of trade compliance and logistics for American Showa.

At the company's prior location, ocean container delivery generally transpired two to nine days after it arrived at the railyard as carriers could deliver only one to two containers per day. Today, container deliveries occur within 1.5 days, on average, as American Showa employees are able to pick up containers themselves and return them to Rickenbacker's rail intermodal facility.

As a result, American Showa's suppliers' routes and pickup times have changed considerably since the end of 2014, ultimately leading to a 15-percent reduction in total mileage in 2015. After achieving such a steady decline in mileage, the company is now focused on improving other aspects of its supply chain as well, as it prepares for its second year of operation at the Rickenbacker facility.

"As we continue to lower our transportation costs, we will also begin to work on improving our inventory controls and stocking levels, as well as operational lead times and production consistency," Reynolds adds. "By identifying where our constraints exist, American Showa will be better prepared to achieve a more optimal operation in the future."

In addition to its potential to decrease drivers' hours and mileage, Rickenbacker's easy access to multiple transportation modes is also significant, especially in the midst of constant changes in the global economy.

"As conditions change, locations that have truck, rail, and international air capabilities, as well as access to port facilities, should be highly valued because each mode allows the same location to be served in different ways," says Kenny McDonald, president and CEO of Columbus 2020, an economic development organization. "If a location is dependent on a singular model based on current oil prices and business conditions, then it is at a higher risk of being unstable, even under slight changes.

"In this dynamic global economy, we can be certain of change," he says. "Capable, flexible locations that allow logistics professionals to serve their clients or enterprise as conditions change are not only rare—they are also positioned to save the day when the sands shift."

ONLINE PURCHASES REQUIRE TIGHTER FULFILLMENT NETWORK

As one of the largest retailers in the United States, Nordstrom had only two fulfillment centers prior to 2014; one on the West Coast (San Bernardino, Calif., dedicated to Nordstromrack.com and HauteLook) and another in the central region of the country (Cedar Rapids, Iowa, which supports Nordstrom.com).

But, as online customer demand continued to increase, particularly on the East Coast, the company began to search for property for a potential third fulfillment center location. Throughout 2013, Nordstrom executives focused on four

Nordstrom's Cedar Rapids, Iowa, fulfillment center supports the retailer's growing e-commerce business.

cities, all in Pennsylvania—Greencastle, Fredericksburg, York, and Elizabethtown.

"Almost half our customers are located within two-day ground delivery of Pennsylvania," says Erik Nordstrom, co-president of Seattle, Wash.-based Nordstrom and head of Nordstrom.com. "We now deliver a big chunk of orders for those customers one to three days faster than they had previously been delivered."

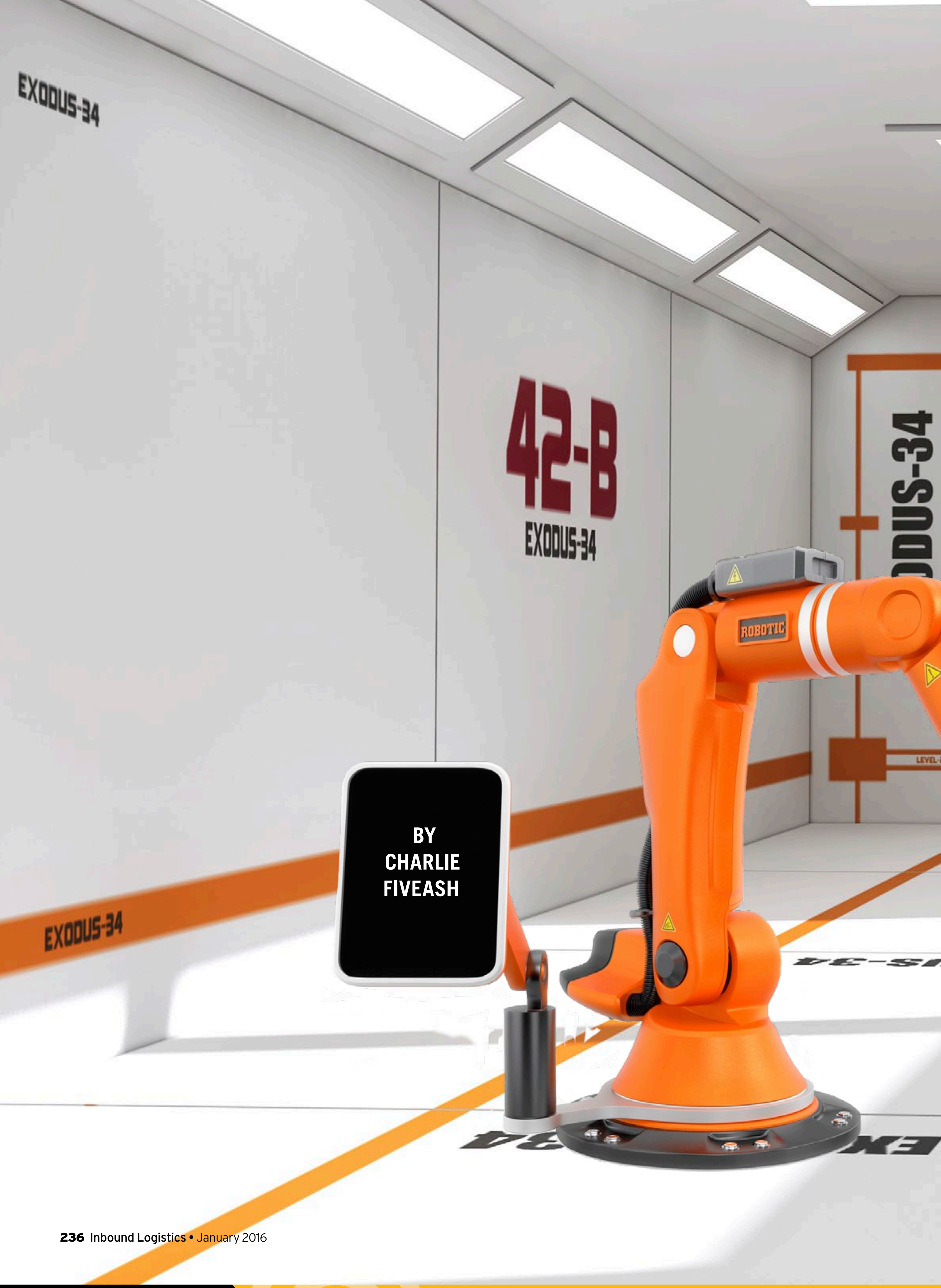
Ultimately, Nordstrom chose Elizabethtown as the site for its third fulfillment center. Construction began in late 2014 and was completed in June 2015. To date, the retailer has hired more than 600 employees, with total employment surging to nearly 1,000 during the 2015 holiday season.

"As we looked at each site, we considered a number of factors and many moving parts that needed to work together," explains Dan Evans, director of Nordstrom's business public relations. "We believed Elizabethtown, with its available and skilled workforce, will meet our hiring needs for years to come, while its flexibility and space allowed us to design the large fulfillment center we desired."

Currently measuring more than 1.1 million square feet, the fulfillment center is also located near several East Coast shipping hubs, ensuring that merchandise is successfully transferred to customers faster than ever before.

"Although we are closer to a large portion of our customers now, we will still continue to ship some orders from our Cedar Rapids fulfillment center to the Northeast, as perfect allocation is never guaranteed," Nordstrom adds. "Our long-term strategy, however, is to have a fulfillment network that reaches at least more than 90 percent of our U.S. customers within a two-day ground delivery."

Retailers such as Nordstrom, along with automotive manufacturers and major industrial real estate developers, have site selection down to a science. ■



BY
CHARLIE
FIVEASH

WAREHOUSE AUTOMATION: *THE NEXT GENERATION*

Is automation the final frontier in your enterprise?

Envision a self-guided forklift streaming down a narrow aisle, feeding inventory into a rack system towering 40 feet above the warehouse floor, while an auto-guided mini-robot transports outbound inventory to fulfillment stations lit up like holiday lights, enabling order processing of up to 2,400 picks per hour. As the perfect order is complete, a high-speed conveyor shuttles packages toward a stationary robot, which loads the contents into a driverless tractor-trailer. Could this be a look into the warehouse of the 22nd century? Nope, it's the modern distribution center of today.

Automation is changing paradigms in traditional warehouse operations, starting in DCs across the global supply chain. With the emerging rise of e-fulfillment centers and centralized DCs across North America, companies are seeking ways to maximize throughput, while enhancing order accuracy through the use of automated materials handling (MH) equipment, high-speed conveyor systems, and robotic applications.

As we go deeper into the new year, distribution centers — specifically e-commerce facilities — are recovering from the onslaught of orders that took place leading into the holidays. "During the six weeks prior to the holidays, retail orders can increase 10 to 20 percent," notes Eric Lamphier, director of product management for Atlanta-based supply chain management software company Manhattan Associates.

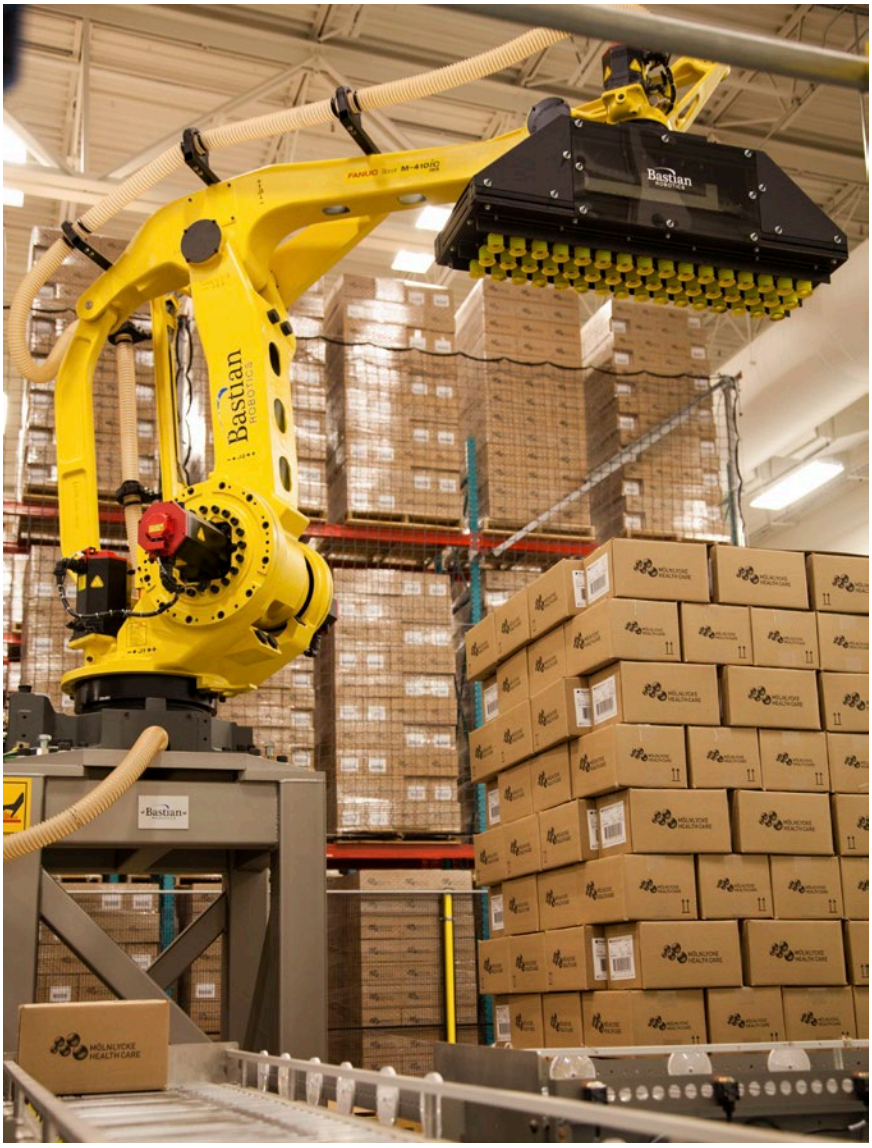
A LOGICAL SOLUTION

How do distribution and e-commerce facilities keep up with year-end demand, while also maintaining inventory balance in the company's operating supply chain?

When Ventura, Calif.-based Patagonia found it a challenge to manage its catalog and web-based orders during peak seasons, the clothing and accessories retailer turned to Dematic, a supplier of logistics systems for factories, warehouses, and distribution centers with U.S. offices in Atlanta, to integrate a highly automated modular conveyor system in its Reno, Nev., DC.

With several thousand orders moving through its distribution channel daily, Patagonia's outdated conveyor process was unable to handle the volume of electronic and catalog orders, creating distribution bottlenecks, failure to meet delivery expectations, incorrect shipping destinations, and excessive return costs.

While evaluating the decision to expand its Reno DC, Patagonia commissioned Dematic to upgrade its conveyors to an intelligent solution, enabling the sorting system to control the speed of materials flowing along its conveyor belts to prevent bottlenecks. Installed in only five days, the new MH system enabled Patagonia's DC to separate and sort heavier cartons destined to store locations from smaller parcel deliveries shipped directly to e-commerce and catalog customers.



Bastian's palletizing robots can handle pallets, slip sheets, and tier sheets for completely automatic pallet building and depalletizing operations.

After implementation, the results were measurable in fewer than nine months. Order accuracy improved and man-hour efficiency increased by 20 percent, while power consumption decreased by almost 30 percent as a result of upgrading from a traditional roller conveyor system to Dematic's belt-driven technology.

AUTOMATION EVOLUTION

Automation in DCs across North America is not limited just to upgrades in high-speed conveyor applications. Innovative supply chain solutions in today's next-generation warehouse include pick/put-to-light, auto-guided vehicles (AGVs) for storage and retrieval, voice-directed technology, wearables, radio frequency identification (RFID) scanning, and robotic applications.

RFID equipment emerged during the World War II era as a combination of telecommunication and laser technologies. But it wasn't until the dawn of the 21st century that the equipment became more affordable and user-friendly in the form of handheld applications. Advancements since the early 2000s include hands-free RFID technology, voice-activated systems, and wearables.

Robotics hit the manufacturing scene more than 50 years ago when Unimation, a small supplier, introduced an assembly robot to General Motors in 1961.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In goods-to-person order fulfillment, product moves directly to the operator, who can then pick what is needed to fulfill orders. This system increases the efficiency and accuracy of the picking process.

Since their early applications, robotic implementations stayed focused on the manufacturing sectors—until now. Today, vision-guided robots have emerged in DCs for loading/unloading, retrieval/putaway functions, pallet stack solutions, and goods-to-person applications. In fact, robotic installations in the United States were up by 11 percent in 2014 over the previous year, and the International Federation of Robots predicts a 15-percent annual growth rate for robotics implementation globally.

In the fulfillment realm, Amazon has been the leader in robotic applications over the past five years, and plans to add 16,000 new robots to its distribution eco-system in 2016. Not to be outdone, Walmart announced earlier in 2015 that it plans to invest $2 billion in its e-commerce platform over the next two years. The integration will include high-end MH solutions.

Next-generation automation in warehousing is not exclusive to the mega-retail and e-commerce platform providers, however. Many mid-sized distribution organizations have made a commitment to robotic palletizing, case packing, AGVs, and high-speed conveyor systems.

THE SHINING BENEFITS OF LIGHT TECHNOLOGY

Pick-to-light and put-to-light technologies offer these benefits:

- Greater order accuracy
- Lean operating systems
- Greater order visibility
- Short implementation learning curve
- Optimized throughput

SORTING AT WARP SPEED

When Cabella's, the world's largest mail order, retail, and Internet outdoor outfitter, decided to open an eastern seaboard DC in West Virginia, it engaged Indianapolis-based materials handling systems provider Bastian Solutions to assist in integrating a fully automated facility, complete with the latest materials handling equipment.

Cabella's new Wheeling, W.V., facility included 25,000 feet of automated conveyors, two sorters to handle retail and catalog fulfillment, and 240 positions for put-to-light systems. The outfitter's goal was to process 90 cartons per minute; after implementation, the sorters were able to exceed that goal by achieving a high-speed sorting output of 94 cartons per minute.

The optimal time to upgrade to a smarter and more automated warehouse is when a distribution center expands, relocates, or consolidates. Major installations can be disruptive to a functioning DC. E-commerce centers are leading the trend in upgrading to advanced MH equipment, but the rest of the distribution markets can watch and learn which integrations are most effective and adaptable to standard warehouse applications.

Next-generation DCs provide order accuracy and speed, particularly in high-throughput facilities, such as e-commerce, apparel, pharma, and food processing warehouses where automation has become the norm. "It's no longer about getting ahead of the automation curve," says Mike Clemons, senior consultant for Bastian. "Operating an intelligent warehouse means implementing the modern technology available in today's arsenal of tools without falling behind the competition."

New warehouse operation advancements are linked to an integration of software solutions that drive the use of MH equipment, inventory optimization tools, and robotics. Best-in-class next-generation software suites integrate highly automated MH equipment with enterprise software solutions. An example in today's modern

warehouse is a warehouse management system (WMS) that exchanges real-time data with a voice-directed or put/pick-to-light application. Another link between software and advanced automation is an application that directs AGVs to retrieve orders while tracking inventory levels in real time.

A new trend in software applications is the concept of warehouse control systems (WCS). The WCS enables a DC's software to interface with its materials handling equipment, order retrieval systems, and distribution technology.

"When it comes to highly automated facilities, warehouse control systems can provide real-time data access where the download is measured in milliseconds," according to Roger Counihan, an account executive for Fortna, a professional services and engineering firm based in West Reading, Pa.

In a smart warehouse, all hardware and software technologies interface with each other. A WCS optimizes inventory levels, while maximizing throughput via advanced goods-to-person applications through the use of pick/put-to-light technology, robotics, and high-output conveyor systems.

Customization is the key to making software and advanced automation sync. "End users must take a holistic approach when integrating existing software applications with today's materials handling advancements in warehouse operations," Clemons says. "You can't operate one without the other."

EQUIPPING THE AWAY TEAM

Fulfillment centers and DCs of the past resembled a scavenger hunt, as associates dispersed across the warehouse landscape in search of the next item to complete an order. The average warehouse worker walks approximately six miles in a typical day to fulfill orders, and 75 percent of an employee's day is linked to order picking, according to research outlined in Robert Palevich's book, *The Lean Sustainable Supply Chain*.

To combat the inefficiencies, today's more advanced distribution facilities have adopted the "goods-to-person" concept as the industry standard.

Goods-to-person fulfillment strategies eliminate or minimize the "labrador retriever syndrome," which requires an order picker to walk lengthy distances to retrieve orders in a distribution facility. Instead of a continuous stream of dispatched employees scattering to storage racks and bins throughout the DC to locate and pick orders, inventory in a goods-to-person platform is delivered to the picker/packer workstation via conveyor systems or robotic delivery modules.

"Today, SKUs are delivered to an ergonomically oriented workstation in a relatively confined area," says Ken Ruehrdanz, warehouse and distribution market manager for Dematic. "Though the work area may be considered somewhat restrained, the station is set up with an ergonomic anti-fatigue mat because today's order processor is more confined to one area vs. the old model of constant walking to pick an order."

Additionally, conveyor heights and pick-to-light displays are built to levels best suited to enhance the employee's productivity. "Bins and conveyors are set up in the

Amazon uses Kiva robots throughout its warehouse to bring items to the packer.

operator's ergonomic 'golden zone' to prevent excessive reaching, bending, or lifting," he adds.

As supply chain professionals seek to fill the perfect order, progressive DCs are focused on order accuracy and speed to customer. Advanced materials management systems—such as conveyors, robotic pickers and packers, and auto-guided vehicles—all collectively yield more efficient fulfillment processes and order accuracy.

When it comes to easy-to-implement automation, pick-to-voice technology ranks high in the category of low capital investment and quick integration. Voice-directed picking offers increased efficiency, accuracy, and safety. Particularly advantageous to distributors with high SKU counts, pick-to-voice systems can be operational in less than one hour, based on their flat learning curve. The voice technology can be integrated with existing WMS software, leading to order accuracy of 99.9 percent.

"We've seen picking rates increase by as much as 35 percent compared to conventional systems," notes Dematic's Ruehrdanz.

An incorrect order pick can cost a typical DC an average of $67 per error, according to a recent Honeywell survey. Under the old model of labor-centric order picking, order quantities peaked at 2,000 to 3,000 per day. With advanced conveyor systems working side by side with voice-directed order fulfillment and pick-to-light systems, order efficiency is optimized and throughput can be as high as 5,000, depending on the industry vertical. "Order picking is where we've seen the most new automation lately," says Counihan.

AGVs REPORT TO THE TRANSPORTER ROOM

As the goods-to-person mantra gains momentum in fulfillment facilities, experts examine how outbound inventory flows from the warehouse rack to the pick station. Auto-guided vehicles hit the market in the early 2000s and have traditionally negotiated a DC's landscape via electronic navigation grids in the warehouse floor.

Founded in 2003, Boston-based Kiva Systems was one of the first innovators in roving warehouse robotics. Based on the company's early success, shipping giant Amazon purchased Kiva in 2012 to capture the emerging market for retrieval robotics in advanced warehouses. Other high-tech MH integrators have followed Kiva's lead and have recently introduced similar robotic retrieval technologies.

> "What is the cost of doing nothing when it comes to upgrades in warehouse automation? Status quo or sitting still equates to moving backwards."
>
> Mike Clemons, Senior Consultant, Bastian

Relatively new to the world of AGV technology is Ontario-based Clearpath Robotics. After three years of extensive research and design, Clearpath introduced its first self-guided robot named OTTO, designed specifically for rapid movement of materials, goods, and inventory.

Based on the premise that most freight is palletized, Clearpath's logistics technology platform is a pallet-focused model. "According to our research, there are 2 billion pallets in play in North America alone, and 80 percent of all freight travels on a single pallet," says Simon Drexler, director of material transport for Clearpath. "With that research in mind, we designed OTTO to carry up to 3,300 pounds—providing 10 to 15 percent more payload than self-guided robots."

Amazon's Kiva robot operates on a predetermined floor grid pattern, but OTTO's intelligence allows it to "learn" the warehouse landscape without the aid of a floor-guided track system. "OTTOs work from a single global reference map, whether a user integrates one OTTO or 50 into a warehouse operation," Drexler explains.

"OTTO's operators enter points of interest, such as dock doors, aisles, zones, and picking stations," Drexler says. "And OTTO's intelligence is able to navigate around various reference points at a safe speed of 4.5 mph.

"Robots are designed to learn," he adds. "The more a robot navigates a particular warehouse, the more familiar the robot becomes with the layout, as well as any potential hazards."

Equally fascinating is the emergence of robotics designed for unloading, bin retrieval, and pallet stacking. Stationary robots with flexible arm implements are capable of performing a multitude of tasks, including unloading a trailerload of cartons, stacking pallets, and picking orders. These robotic functions are designed to take the place of warehouse tasks that laborers

Clearpath's OTTO is a self-driving vehicle that effortlessly moves large items and standard pallets around a warehouse or distribution center.

detest—jobs that fall under the 3 D's category: dirty, dangerous, and difficult.

Robots used for carton stacking or order retrieval have a built-in 3D vision sensor to enable them to identify the carton size to retrieve in the stacking order of a pallet configuration. "The robot is programmed to place a larger box at the base of a pallet and smaller cartons on the top for optimal stacking," states Clemons of Bastian.

STARDATE: THE FUTURE

Here are the top five next-gen warehouse automation applications:

1. Goods-to-Person Automation
2. Automated Palletizing/ Case Packing
3. Pick-to-Light/Put-to-Light Technology
4. Robotic Picking/ Retrieving Systems
5. Voice-Activated Order Management/Wearables

Robotic applications are more adaptable in today's modern DC due to the ability to modify the robot's function to align with the user's requirement. For example, the same advanced robot can unload cartons from an inbound trailer in the morning and transition to stacking boxes on a pallet in the afternoon — with only a basic arm adjustment.

In fact, Blue Ocean's Mini-Picker is compatible with the market's leading robotic manufacturers. The Mini-Picker's robotic arm can be attached to a Universal, KUKA, or ABB robot as an accessory. As the name suggests, the Mini-Picker is designed to select smaller items, such as a single screw or bolt, and place the item in a bin, carton, or other shipping device.

The goal of robotic implementation is not to curtail job opportunities but to create a smart warehouse with advanced productivity and increased throughput. In fact, robots are designed to work in conjunction with the labor force. Repetitious warehouse tasks, such as unloading a floor-loaded trailer or container, are being assigned to robots and automated processes.

"As costs come down and robotic functions are perfected, we'll see more robots working alongside warehouse employees to promote operational efficiencies," predicts Tim DeRosett, CEO of Blue Ocean. "Robots are actually designed to collaborate with humans."

LIFE SUPPORT SYSTEMS

While warehouse innovation and automation trends toward upgrades in order picking and advanced materials handling equipment, the question of the equipment's useful life enters the equation. Most machinery, hardware, and MH equipment in the distribution sector has a projected lifespan of 20 years, according to Clemons.

However, technology applications will outrun the hardware systems in the foot race to obsolescence. The useful life of software systems in distribution applications will sustain only 25 percent of the projected lifespan of an automated hardware implementation — meaning that most software innovations will last approximately five years before new WMS/WCS technology is introduced to the marketplace.

While all these next-generation implementations sound enticing, what is the price tag for integrating the latest RFID technology, voice, conveyors, an upgraded WMS, or robotics? The better question may be: Can a user afford not to invest in warehouse hardware and software applications available in today's arsenal of upgrades?

"What is the cost of doing nothing when it comes to upgrades in warehouse automation?" asks Bastian's Clemons. "Status quo or sitting still equates to moving backwards."

Capital costs of conveyor systems have dropped considerably since 2005 — in an era when a complex conveyor installation might crest in excess of $10 million. When contemplating an investment in highly automated warehouse equipment, cost considerations should be a major factor in the rollout and implementation.

Robotic systems used in palletizing and case packing, for example, start at $150,000 and can easily surpass a seven-figure investment, depending on the number of machines and scale of the equipment. Despite the seemingly high costs, distribution and manufacturing companies can expect a payback within two to three years. "On high-level automation, some companies will concede to a four- to five-year payback," according to Clemons.

As e-commerce DCs see order demand increase exponentially, automation and technology must keep up with the high throughput requirements. "E-fulfillment demand continues to increase 20 to 25 percent over the previous year," notes Manhattan's Lamphier.

While even the most progressive DCs are still evaluating various automation trends — such as robotics for loading/unloading and pallet stacking — AGVs and pick-to-light technology are more recognizable applications, particularly in fulfillment centers. Given the trends in warehouse automation, what can we expect in next-generation hardware and software developments?

Recently, the concept of utilizing drones inside a DC for goods-to-person applications was introduced. "This is still early stage technology," comments Peter Counihan, chairman of Fortna. "Other warehouse innovations are gaining more traction. Customized 3D printing is a trend that will have a significant impact on the evolution of materials and the Internet of Things."

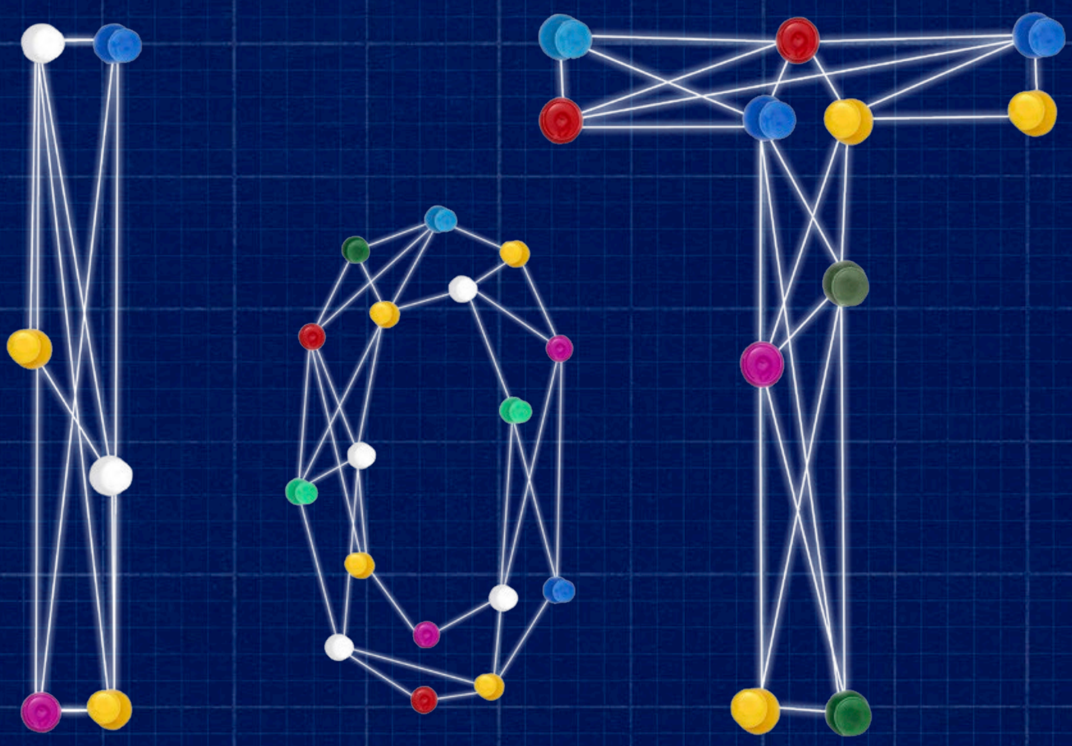
MAKE IT SO

Who is leading the way in the warehouse automation revolution? Automation is trending most rapidly among certain industry verticals, but only in a limited number of global markets. In fact, according to the International Federation of Robots, 70 percent of total sales volume for robotic applications is taking place in the following five countries:

1. China
2. Japan
3. United States
4. South Korea
5. Germany

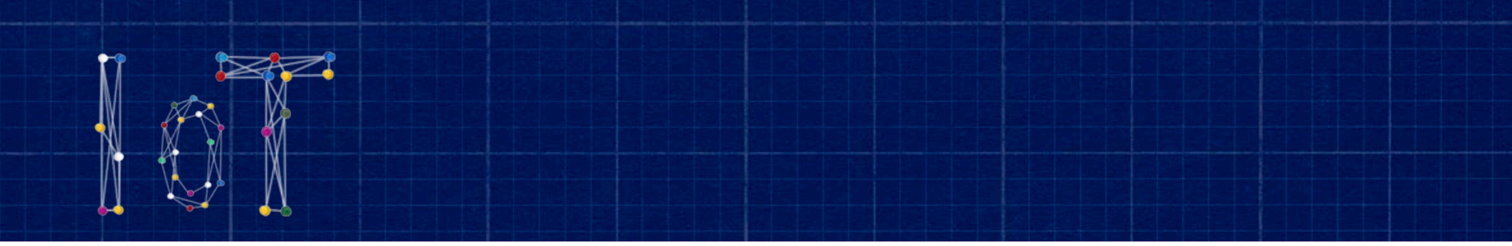
Based on recent exponential growth rates in omni-channel e-tailing, fulfillment centers are preparing to meet market demand for same-day and next-day deliveries, particularly around the holidays.

An automated DC equates to a smart and efficient DC. ■



IN THE SUPPLY CHAIN

The Internet of Things will make the supply chain as we know it a thing of the past. Let our experts plug you in to the latest IoT know-how.



The IoT Supply Chain: 3 Things You Should Know

by Diane Palmquist Vice President, Manufacturing Industry Solutions, GT Nexus
and Tyson Leal Director of Industry Markets, TransVoyant

In 1984, the number of devices connected to the Internet was 1,000. In 2016, 6.4 billion connected things will be in use worldwide, up 30 percent from 2015, according to Gartner. By 2020, connected devices will number a staggering 20.8 billion, the research firm predicts.

As the world becomes increasingly connected via the Internet of Things (IoT), the amount of data being created and shared is skyrocketing. This will have a profound impact on the supply chain, making it hyperconnected, innovative, and extremely smart. Here are three things you should know about the IoT supply chain:

1. IoT will generate a massive wave of new supply chain data.

Sensors are tagging and connecting factories, ships, and machines, even down to cartons and items. Sensors provide awareness of real-time conditions, and connectivity allows "things" to instantly communicate conditions via the Internet. These objects essentially become smart. They transmit signals and data that are captured to provide a closer picture of the true state of business. Managers can make decisions and take action based on that data—which will soon be everywhere, in mass quantities.

2. Executing the IoT supply chain requires a central nervous system.

The data streaming in—from trading partners, ships, trucks, factories, DCs, stores, weather bureaus, and ports—needs to be standardized, sorted, and visible. In addition, it has to be usable. This requires a central hub or platform. Similar to how ERP software operates internally, the central nervous system is the connective tissue between all parties and things. It houses the data and makes it actionable. Businesses can have unprecedented visibility into every process and transaction along the way. And actionable data will provide a layer of predictive insights.

Severe weather, port delays, or late delivery of goods are accounted for to assess priorities and options, and offer the optimal decision automatically. This central hub resides in the cloud, providing a networked ecosystem that serves as the foundation of the IoT supply chain.

3. IoT is already here, today.

Fortune 500 companies have already begun implementing this real-time, "live" IoT platform in order to answer key questions such as: "Where is this particular shipment?" and "When will it actually arrive?" This means real-time visibility into the precise location of shipments.

But the question is not only where is it? *Where is it going to be?* is what matters. Platform analytics process hundreds of thousands of data points in real time—comparing vessel trajectories and speed against diversion-causing weather forecasts; tweets about labor strikes in the ports of destination; predicted lower- or higher-than-usual port dwell times; port congestion caused by natural disasters—to provide predictive indicators into the precise arrival time, down to the hour, the moment shipments leave ports of origin (a vast improvement over static freight forwarder ETAs, which can be off by days or weeks).

Tracking the movement of goods today is still fragmented by region and mode. Processes still rely on phone calls and emails.

True visibility is minimal—leaving agility off the table. The IoT brings a massive opportunity to leverage new levels of connectivity and massive waves of data, to assure the timely delivery of goods.

Current IoT Apps in The Supply Chain

- Phones can scan barcodes. This is useful for picking, packing, and putaway operations in the warehouse or DC.
- Dockworkers use smartphone or tablet cameras to capture load discrepancies and communicate this to all relevant parties in real time.
- Third-party truck drivers arriving at distribution center yards use the same type of applications that airlines commonly use to expedite passenger check-in.
- Yard management apps exist that allow distribution centers that "live-unload" trailers to provide constant feedback and directions to truck drivers on where and when to bring their trailers to the warehouse.
- Apps are also available for shippers to hire carriers, set pickup appointments, and update shipment status.
- In asset management, the phone functions as a tracking device, monitoring signals from objects nearby or far away.

Excerpted from *The Internet of Things and the Modern Supply Chain*, a whitepaper by Gregory Braun, senior vice president, sales and marketing, C3 Solutions

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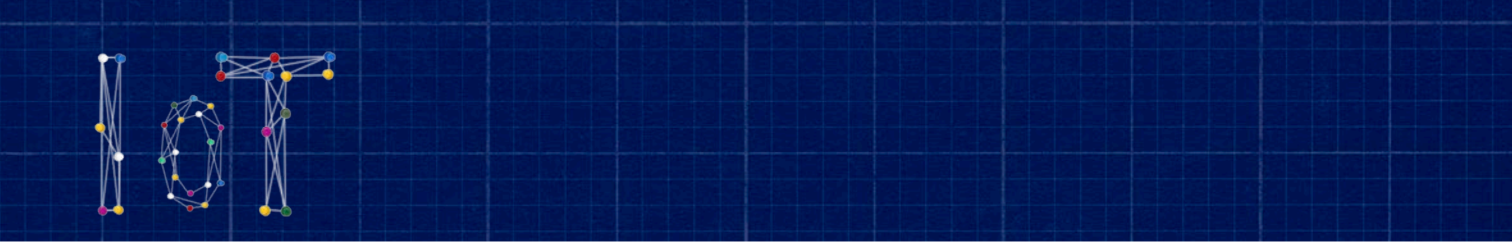

How Your Supply Chain Benefits From IoT

by Glenn Johnson Senior Vice President, Magic Software Enterprises Americas

The supply chain can gain the most from IoT technology. Shipments can be traced throughout the delivery process, speeding up implementations. When stock is low, the IoT is proactive and places orders to restock various items automatically. Equipment monitoring can also be used to predict when equipment needs service and maintenance.

Things Bring Visibility

The supply network involves multiple touchpoints. Manufacturers, suppliers, and customers need visibility and access to accurate, up-to-date information at every point along the way for an IoT application to provide the data they require to optimize logistics and transportation processes.

The IoT will improve visibility of products in the supply chain, allowing supply chain managers to see data for packages, materials handling equipment, vehicles, and warehouses from any device, such as GPS and RFID readers.

Strengthened by advanced technologies, sensors, and a strong informed supply network, businesses will be able to predict, correct, and even prevent problems such as inventory outages, failed equipment, poor environmental conditions, and safety hazards before they occur, keeping their supply chains running at optimal efficiency.

Things Allow Integration

IoT will affect every aspect of the supply chain. The product lifecycle management (PLM) system will grow to incorporate in-service product performance measuring and monitoring. The enterprise resource planning (ERP) system will be able to detect a malfunction and issue a work order for the parts that need repair and replacement; and the customer relationship management (CRM) platform will automatically feed pipeline data that improves forecasting so buyers better anticipate supply chain needs.

With the integration of these systems, IoT will revolutionize the customer experience. Picture this: Your company bought you a cellphone four years ago, and the charger is failing due to a badly worn cord. The cellphone detects the intermittence of the electrical signal and sends an alert to the integration platform, which routes communications to the e-commerce, PLM, and ERP systems.

Your company's purchasing agent then receives a replacement order form automatically from the marketing automation system, and the product manager receives data in the PLM system informing a decision to improve future models. The e-commerce system receives your approved order, and the integration platform triggers the ERP system to record the transaction and the logistics system to ship it to your office.

You receive the package with a message, "Your cellphone charger is about to fail. Here is the replacement." Upon delivery confirmation, the integration hub then triggers the CRM system to send you a thank-you note for the order, and records responses to a customer satisfaction survey.

Without integrating the core systems, this amazingly satisfying business process would be manual, time-consuming, and detrimental to the customer experience. IoT-capable integration platforms need to be real-time, highly scalable, and completely secure. As IoT becomes a more standard technology used to optimize business processes, you need to make sure your integration architecture can handle, adapt, and grow to meet the supply chain's complex data integration requirements.

In-Transit Visibility, Brought to You by the IoT

The coming years will bring a strong focus on cargo transport security and increased supply chain visibility, predicts analyst firm Berg Insight. The number of active tracking devices deployed in cargo loading units—including trailers, intermodal containers, air cargo containers, cargo boxes, and pallets—reached 1.8 million worldwide in 2014, and is expected to reach 5.8 million by 2019.

The maritime shipping industry has started to embrace real-time container tracking on a large scale.

"The foremost example to date is Maersk Line, which recently announced a major implementation," says Johan Svanberg, a senior analyst with Berg Insight. After several years of pilot projects, 290,000 of Maersk Line's refrigerated intermodal containers are now connected.

Logistics and transportation companies are accelerating their IoT efforts to improve productivity and customer service levels by taking advantage of the increasing volume of data that cargo tracking solutions generate.

Effective cargo tracking will also help companies ensure compliance with the increasing chain-of-custody regulations being implemented worldwide. Especially for sensitive cargo such as livestock or perishables, being able to collect and use data about conditions during transit will pay dividends when regulators ask for their reports.

Excerpted from *The Internet of Things and the Modern Supply Chain*, a whitepaper by Gregory Braun, senior vice president, sales and marketing, C3 Solutions

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IoT

Transforming Supply Chains Into Supply Streams

by Amarnath Shete Global Head, Internet-of-Things Advisory, Wipro Digital

The Internet of Things (IoT) has tremendous potential to change the structure of the supply chain—from a linear, step-by-step process, to a seamless, data insight-driven stream. By enabling innovation, communication, and an improved customer experience, IoT can transform supply chains in the following key areas:

■ ***IoTizing* the warehouse.** By enabling IoT levers, warehouse managers can better track, trace, and move inventories, as well as prevent loss and damage. IoT allows integration between intra- and inter-logistics components, which reduces wait time and streamlines coordination between logistics providers and warehouse managers.

■ ***IoTizing* inventory management.** IoT provides a multi-level true view that includes in-transit and at-rest inventory across all echelons, allowing supply chain managers to have visibility of their entire inventory at any given point.

■ ***IoTizing* logistics.** IoT platforms can marry GPS-based tracking with other transactional data to provide logistics and supply chain managers with a clear overview and insights that support tactical decisions. In addition, IoT can integrate forecast weather changes with route schedules at hyper-localized levels, allowing more responsive, granular scheduling and routing decisions. IoT also can help avoid losses while transporting perishables by continuously monitoring the health of the inventory and enabling precautionary steps.

■ ***IoTizing* shop floor management.** IoT provides production status at workstations, helping shop floor managers determine how close they are to achieving target production schedules.

■ ***IoTizing* new product development.** IoT provides sensors and device capabilities, as well as the platform to view product movement through the supply chain. Product development teams can leverage this data and analysis to improve supply chain efficiency.

IoT fills in the gaps and creates a seamless, predictable, and enormously more efficient supply stream. ■


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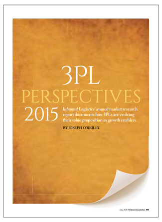
Questions? nwseaportalliance.com
The Northwest Seaport Alliance is a marine-cargo operating partnership of the Port of Tacoma and the Port of Seattle

THE

MOST READ STORIES OF 2015

You clicked and we listened. Here are the articles and decision support tools on *Inbound Logistics'* website that captured your interest and got you talking.



2. Top 100 3PL Providers

July 2015

bit.ly/Top1003PL

Our annual list of top 3PL providers is a reader favorite year after year; 2015 is no exception. The list includes well-known companies, 3PL niche providers, and newer companies offering specialized logistics services. The solutions-based resource lists important information about each provider in a handy chart. More details on the capabilities of these companies can be found on the 3PL Decision Support Tool (bit.ly/3PLDST).

4. Breaking Down Big Data

January 2015

bit.ly/BreakingDownBigData

Every shipper knows that big data is a big deal. It's not quite a household term, but it's certainly a phrase used in every office. But what does it mean? How does it apply to your operation? With so many questions on the table, *Inbound Logistics* gathered a few "Data Miners" to talk about trends and challenges in the business intelligence world.

5. Inspecting the Unexpected: The Science of Packaging Perfection

March 2015

bit.ly/PackagingPerfection

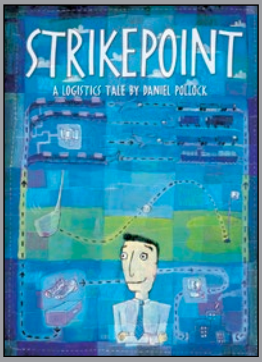
While packaging has sometimes been neglected in supply chain decision-making, its potential to contribute to greater efficiency and an improved customer experience is raising its profile. Readers bookmarked this page to help avoid common packaging mistakes and keep high transportation costs and inefficiencies from boxing them in.

3. Top 10 U.S. Container Ports

October 2015

bit.ly/Top10USPorts

Port selection is an important component of supply chain strategy. To help make sense of where volume is trending, *Inbound Logistics*' Top 10 Container Ports provides a snapshot of the U.S. port industry, giving readers handy stats to make their port selection decisions.



Strikepoint #1

May 2001

bit.ly/Strikepoint

Readers revisited *Inbound Logistics*' three-part nail-biter *Strikepoint*—a fictional tale of one man's quest to solve a logistics conundrum—how to get a rickety supply chain to respond to sudden demand. Read the entire story in this edition (page 261), or online, and let us know how today's technology would alter the game for our hero, Gan McManus.

#6. Good Question: Readers Weigh In

November 2015

bit.ly/GoodQuestionLogistics

Our newly created commentary page, where readers answer our question of the month, has quickly become a reader favorite. Respondents explore the difference between logistics and supply chain, what makes logistics an exciting profession, and other hot-button topics. Check out each month's new question, and keep your answers coming!

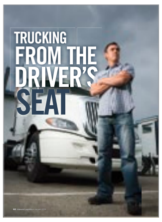
Email editorial@inboundlogistics.com.

7. The Shape of 'Things' to Come

July 2015

bit.ly/IoTUpdate

As sensors, communications systems, and analytics solutions all become cheaper, faster, and more capable, many more things will start talking to one another via the Internet. This feature discusses what the Internet of Things means for the supply chain—now and in the future.

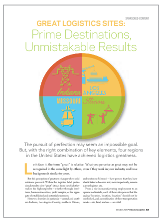


8. Trucking From the Driver's Seat

January 2015

bit.ly/TruckersView

Without the right people behind the wheel, supply chain activity would come to a screeching halt. From first mile to last mile, and every mile in between, truck drivers are the backbone of your supply chain. This article celebrates a few veterans of the road.

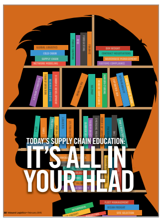


9. Great Logistics Sites: Prime Destinations, Unmistakable Results

October 2015

bit.ly/GreatLogisticsSites

Offering a potent combination of key elements, four regions in the United States have achieved logistics greatness. From a rise in manufacturing employment to an upturn in clientele, each of these sites proves that location should not be overlooked, and a combination of three transportation modes—air, land, and sea—is vital.



10. Today's Supply Chain Education: It's All in Your Head

February 2015

bit.ly/SCEducation

The list of competencies employers seek when they recruit supply chain professionals keeps growing longer and more complex. Here's how degree-granting programs enable graduates to fill prime positions.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STRIKEPOINT

A LOGISTICS TALE BY DANIEL POLLOCK

(Originally published in 2001)

Faced with sudden, unprecedented demand for its product, a staid company taking an antiquated approach to transportation discovers just how important world-class logistics can be. There isn't much an 11th-hour conversion to logistics best practices can do to beat the odds on this "bet the company" gamble…or is there?

— PART ONE —

IT CAME LIKE A BOLT OUT OF THE BLUE THAT FRIDAY. Rob Wylie, a defector to Cornelius' humongous rival, Zip Athletic Wear, had called, offering Gan a "real" logistics job. For more money. Plus stock options that could actually mean something. And, probably the clincher, a chance for Gan finally to use some of the supply chain savvy he diligently acquired at Penn State and in professional coursework since.

"Face it, Gan," Rob had said, "you're being wasted down there. I remember reading copies of your memos about how you guys could streamline your antiquated supply chain. Pretty damn impressive. But they all wind up in corporate hyperspace, right?

"Believe me, that won't happen at Zip. We thrive on change. We'll plug you into our worldwide logistics team. We'll even throw in a real office, not a Dilbert-sized cubicle like the one we used to share. You'll see the Bay Bridge and the Berkeley Hills, not just smog and swampland."

That last crack was a reference to the drab location of Cornelius' corporate headquarters—in an L.A. industrial park north of the airport, miles from the nearest Starbucks. A gratuitous comment, sure, but most of Rob's shots had been dead-on. Gan had spent the weekend weighing the attractive offer while backpacking in the Santa Monica Mountains.

He'd promised his answer Monday. D-Day. *This morning*. He pulled on sweats and backpack and headed out for his three-mile jog to the office, thinking: *How can I say no?*

Gan McManus had logged seven solid, upwardly mobile years with Cornelius Footwear, starting weekends while still in college, en route to his current status as assistant manager, National Customer Service. He believed in the company product. For his money, Corn Dogs were the best darned running and walking shoes in the world. Which was why he was pounding the pavement with a well-worn pair this morning.

Zip, on the other hand, turned out glitzy and klunky athletic shoes—by the gazillion. Which meant it must be doing everything else right. Its speed-streak logo got splashed across magazines and billboards, stitched on the caps and shirts and shoes of superstar jocks. And the company kept right on expanding its global footprint, pushing competing brands off the retail shelves.

While Cornelius was sinking, day by day, into corporate irrelevancy. Gan had done his darnedest to turn things around. But his impassioned pitches, his long and detailed logistics memos, either got ignored or chewed up in departmental turf wars, just as Rob Wylie had said.

Oh, Gan had a few loyal backers. His immediate boss, Mary Ann Dugan, for one, but she lacked corporate clout. Ditto the traffic manager, Ed Combs, an ex-Army logistics officer now nearing retirement. Other higher-ups had privately expressed support, but somehow Gan's ideas never culminated in anything.

Until Friday—and Rob Wylie's phone call.

And Gan was overdue for a shakeup—for a challenge he could finally sink his teeth into.

Call him traitor. Call him sellout. Call him ...

Gone!

With this resolve, and huffing like a steam locomotive, Gan McManus jogged into the lobby of Cornelius' low-rise office building and up two flights to his office—okay, his cubicle—ready to give notice.

"YOU'RE WANTED UPSTAIRS, Gandalf, me boy," announced Ellie Rasmussen, peeking over the partition with her owlish glasses.

"What for?"

"I ask not, nor am I told. It is Mary Ann herself who summons thee hence."

"Speak English. Not Old English. And I'm not going anywhere till I shower and change."

"No, really, Gan!" Ellie's tone quick-shifted from playful to serious. "They're all up on six. They've been phoning your cell the last hour."

"Damn!" Gan had switched off his mobile phone after getting twice telemarketed in the mountains, never switched it back on. With a wave at Ellie, he ducked into the restroom, threw on a clean shirt and tie, and headed for the elevators. What would the crisis du jour be? Another customer complaining about a supply chain breakdown? Another national account threatening to dump Corn Dogs? More to the point: What kind of catastrophe would conceivably require Gan's presence? Answer: None. Which is why he was about to jump ship.

On the sixth floor, beneath the atrium skylight, a matronly, silver-haired receptionist met Gan and escorted him to the oversized door of a conference room. "Go right in," she said, smiling encouragement.

Holy Cornelius!

The whole top command was seated around a long gleaming table, legal pads, cell phones, and PDAs at the ready. Gan identified the directors of Sales and Marketing, Operations, Purchasing and Finance, IT and HR, Corporate Communications and Legal, along with their ranking deputies. At the near end of the table were Gan's allies, Mary Ann Dugan, Director of Customer Service and Ed Combs of Traffic, with an open chair conveniently between them. Presiding at the far end was their CEO, white-haired, ruddy-faced John Enright, who had glanced up at Gan's entry.

"Mr. McManus, nice of you to join us. You'll find coffee and muffins on the sideboard. After you settle in, we'll get to some of your ideas. It has been quite a morning, as you can well imagine."

"Obviously," Gan said, totally clueless. *It's like my old school nightmare—getting to class late and being called on for an answer, not knowing the question*.

SO WHAT HAD HAPPENED?

Gan scribbled this desperate query on Mary Ann Dugan's legal pad after sliding into the empty seat. His angular, flame-haired boss scrawled a question of her own beneath his: "You really don't know?" When Gan shook his head, she launched into rapid writing. Meanwhile, from her wheelchair halfway down the table, PR director Libby Skidmore was quoting media ad rates and dates.

From Mary Ann's emergency update, Gan learned they'd had good news for a change. Terrific news, in fact. Yesterday, while he had been communing with nature and meditating career moves, legendary golfer Bigger Scott had come out of retirement to win the U.S. Open. Afterward, Scott had credited his comeback and victory both to Corn Dogs—"*on network TV!*" Mary Ann wrote and underlined.

The morning meeting, obviously, was all about brainstorming ways to capitalize on this windfall PR. Which explained why Libby Skidmore, whose budget was usually restricted to quarter-page ads in *Runners World*, was discussing major media buys. Even Gan, no golfer, knew the U.S. Open was a big deal. He recalled that Bigger Scott had won a lot of tournaments way back when, before being forced into retirement by a bad back.

"The main copy points," Libby Skidmore was saying, "are that Corn Dogs not only let Bigger walk without pain, but return to the PGA tour and, ultimately, whip all the young phenoms."

"And he's definitely okay with us saying that?" Enright asked.

"Absolutely, John, and for free! He's *that* grateful. It's like having Oprah plug your book. It guarantees a best-seller."

Gan wrote on Mary Ann's pad: *When did we start making golf shoes?*

"*We don't*," came her answer. "*The guy was using our old inserts.*"

A discontinued product! But the endorsement would still work, Gan thought, because the company's entire athletic shoe line was based on those original shoe-insert patents.

"How many of you saw Bigger's incredible hole-in-one and Corn Dog endorsement?" John Enright asked the table, "either live or on Sports Center?" Gan watched a few hands go up, then scratched his ear tentatively.

"Well for those of you who missed it, we've got the tape," Enright said.

All eyes were riveted to the TV screen to watch Bigger Scott address the media throng surrounding him after his win.

"When I brought the club around for that shot on the second hole, it seemed so perfect, so peaceful. I felt better than I felt in years, the pain in my back was gone," Bigger told his audience. "And when the club met the ball at the strikepoint, I just knew, with all my senses, that the ball would end up in the cup. And it did. I knew I was hot, and I would stay that way all day.

"When I reached the last hole I wondered how and why I had played like I used to," Bigger continued. "Then it hit me. I was playing without pain because I was wearing Corn Dogs…"

Enright stopped the tape.

"A hole-in-one on the second hole, then one great shot after another," Enright said. "One flagging career resurrected—and, perhaps, the future of one flagging shoe company. It has to rank up there with all-time great sports comebacks."

"Like Jack Nicklaus' Masters win in 1986," recalled Ed Combs. "Forty-six years old and he beat all those young hotshots. Except we can still miss this comeback opportunity."

Ed was right, Gan thought. They were a long way from paydirt. And the Oprah analogy only went so far. Before she recommended a book, Gan knew, her staff alerted publishers to make sure titles got shipped to stores in quantity, flooding the pipeline with product. Bigger Scott, on the other hand, had plugged Corn Dogs out of the blue. With its slow and rickety supply chain, could Cornelius react nimbly enough to capitalize on this media moment? Or would its product arrive on shelves long after demand had died—the classic failing of push logistics—leaving the company with millions of dollars in unsaleable inventory?

This question was hotly debated over the next half-hour—push vs. pull, reward vs. risk. Like everyone else, Gan took furious notes. *What the hell am I doing?* he wondered once or twice. *This was supposed to be quitting day.* But the issues were compelling, potentially linking every department in exactly the kind of cross-functional, integrated teaming Gan had persistently, and vainly, advocated. If Cornelius Footwear was to capitalize on this opportunity crisis, everyone would *have* to work together.

Sales and Marketing was gung-ho, of course, in the sizable person of Geoff Mullins, who oversaw both departments. He had been on the phone all morning with his reps in the field, all of whom were being flooded with orders for Corn Dogs. "A PR bonanza like this, John, it could create—what is it you call that, Gan?—a strikepoint for our entire product line. Like Razor scooters, only for adults."

"I'm a CEO, not a logistics expert. What the heck is a strikepoint?" asked John Enright, staring at Gan.

Gan gulped. "It's, uh, just a logistics term I came up with. It's the point at which our supply chain can handle maximum demand before it starts to implode." He paused, and leaned forward. "We have to move *our* strikepoint forward if we try and do this, or it could cause our company to implode as well."

"Sounds awfully iffy to me," cautioned Serge Saunders of Operations in his best schoolmasterish tone. He was flanked by his Manufacturing and Planning chiefs. "We can't begin to fill this spiked demand from existing inventory and manufacturing capacity."

"So ratchet up production," Mullins said, slapping the tabletop. "Pay a premium if you have to."

"*If* we can find capacity and predict what kind of demand and manufacturing capacity we're talking about." Saunders turned to a stocky, bronzed man on his left—Alex Ordonez, head of Manufacturing. "Please, Alex, explain the problem."

"We can't just go out and grab suppliers," Ordonez said. "Zip has tied up shoe factories all over Asia, from Bangladesh to the Philippines, and has been stockpiling raw material. It's gonna be a squeeze to make more Corn Dogs fast enough."

"And by the time we *are* able to gear up in our Asian plants," Saunders stepped back in, "and get product back to the States, our little window of opportunity will have closed. I hate to puncture your euphoric balloon, Geoff, but I'm afraid we'll be taking markdowns just to cover the cost of the shoes."

"Worse," said Al Hirschorn of Finance. "We could mark down *below* cost."

"Serge, and you, too, Al, you both need to talk to my sales reps. They don't see this as some passing fad. They're telling me, the buzz is huge out there. It will last. Bigger Scott has put us on the map big-time."

"For how long?" Serge asked. "Suppose while we're tooling up..."

"*And* investing a lot of capital," said Hirschorn.

"...Right, and then suppose next week some kid sinks a 40-foot putt. Suddenly Bigger Scott is old news. We end up like every outfit that gets to market too late chasing a retail craze. We get to eat our whole damned inventory."

"Forget about the guy *winning* another tournament," said Hirschorn. "What if Bigger Scott breaks his arm tomorrow and never *plays* golf again? *After* we go into debt financing all this new production?" This, Hirschorn suggested, would be comparable to a Joe Montana or Magic Johnson retiring suddenly, leaving companies with millions of dollars of signature helmets or basketballs kids no longer wanted. "Which actually happened!"

"You guys just don't get it," Mullins argued back. "Bigger Scott can retire tomorrow. Doesn't matter. His comeback is already a certifiable sports miracle. People won't forget what he did—and what Corn Dogs did for him. Which is why he's willing for us to use his name and endorsement, gratis."

"And from what I hear," put in Libby Skidmore, "potential sponsors are already bidding up his services."

"Which prompts a question," John Enright said. He turned to their Corporate Counsel, Holly Needham. "What endorsement deals does Scott already have?"

Holly checked her notes. "None. His previous sponsorships and marketing arrangements all expired during the years of his forced retirement."

"Good. I want this glorious offer of his nailed down in black and white. Fast. Before he forgets."

"UNDERSTAND, I'M NOT READY TO COMMIT US TO any particular course of action," Enright said. "We're just revving in neutral here. You've all made some excellent points, pro and con. Let's dwell on the con. Tooling up will be an obvious problem. Predicting demand will be even more difficult, and estimating how sizable our window of opportunity really is ..."

"Excuse me, John." Libby Skidmore leaned forward in her wheelchair. "But that's the whole point of the media campaign I outlined—to keep Bigger and Corn Dogs in the public mind, to see that ball dropping into the cup over and over."

"And I realize that, Elizabeth. But it would also help if we had that advanced planning tool Mary Ann kept nagging me about ..."

This got Gan a quick nudge from his boss. The lack of planning and scheduling software had been one of *his* pet peeves, which Mary Ann had relayed upward, to no avail.

"...But we don't, alas, so it would be too late to help us in *this* crisis. Now we come to our domestic distribution problems—late shipments, bad fill rates, chronic breakdown in our WMS, inadequate shipment tracking, and, of course, our old friends at Zip taking up more and more shelf space in all the chains and discounts. Did I leave anything out, Mary Ann?"

"Probably. But isn't that why we're all here this morning, John? To reverse all the downward trends, to turn things around fast? I mean, if we aren't the A-Team, who is? And if not now, when?"

"Noble sentiments, Mary Ann," Serge Saunders said, "but let's not get carried away. I'm afraid the downside risks are just too great. I say we ship whatever we can in response to Geoff's orders, and increase production incrementally, as demand warrants."

"Basically what you're saying," Geoff shot back, "is forget scoring a touchdown. Let's punt."

"Or," Mary Ann Dugan said, "since the maze is too scary, let's just stay here and eat our dwindling cheese."

"Please!" Al Hirschorn of Finance lifted hands in supplication. "Not that moldy cheese metaphor again."

Then how about Shakespeare? Gan was thinking of classic lines from Julius Caesar: "There is a tide in the affairs of men, which, taken at the flood, leads on to fortune..." He kept his literary allusions to himself, but Geoff Mullins spoke for him:

"If you don't like cheese, Al, pick your own metaphor. Personally, I like football. I say we play to win. Throw long. Seize the day, whatever. Build the business. That's what Ike Boone is doing, and he's whipping our and everybody else's butt with his junky shoes."

There was a gap of silence, into which came the measured voice of Hal Matsuura: "We *could* take a page out of Zip's book. Or, more specifically, from its website. You know, where you can design your own shoes by size, color, trim, and other options? We could create a Bigger Scott shoe, then offer it only on the Internet. We could mass-customize the basic shoe, then tack on individual options, and only finish and ship what customers actually wanted."

"That's very cutting-edge, Harold," said Ed Combs. "And I like the mass-customization angle. But that virtual shoestore stuff, come on. If it's not hypothetical, it sure as heck is marginal."

"I agree," said Geoff Mullins. "We've been pouring too many resources chasing this e-tail fantasyland stuff. And giving short shift to our real retail customers. *That's* where Ike Boone and Zip are really beating us."

"All right," Enright said. "Cyberspace is definitely not going to solve our dilemma, not this year, not next." He looked over at his Traffic Manager. "What's your opinion, Ed? Should we go after all this business with a crash-and-burn attitude—launch a Hail Mary pass, like Geoff says? *Can* we pull it off? Can we leverage what may be a fashion trend into solid, long-term growth? If so, how? Can we deliver?"

Along with everyone else in the room, Gan turned toward the grizzled ex-Army log officer who had been his principal mentor at Cornelius.

"Last question first," Combs said. "*How* do we do it? I don't have a plan yet. Next. *Can* we do it, *should* we do it? Hell yes—to both. Is it impossible? Maybe. So was Desert Shield—and the penalty for failure there was annihilation. There we were, a bunch of guys with clipboards, setting up latrines and mess tents with a major chunk of Saddam's Army dug in just across the border, ready to roll over us. Talk about logistics under the gun. But we did it."

"You guys had the best expertise available, right?" said Geoff Mullins. "So why don't we go out and hire a topflight consultant or a 3PL to come up with supply chain solutions? Not to suggest that you couldn't do it, Ed."

"No offense, Geoff. Outsourcing may be the best answer. But our window to implement is too small to select the right partner. And it happens we've got some expertise right here, which is why Mary Ann and I wanted Gan McManus here this morning."

All eyes suddenly shifted to Gan. He reached for his water glass. Wouldn't this be a hell of a moment to tender his resignation?

MARY ANN WAS SPEAKING NOW.

"Some of you know Gan McManus—short for Gandalf, for those of you who read *Lord of the Rings*. A wizard, right? All of you, I think, have read his memos. And if you haven't, you should. He has a Master's in business logistics from Penn State. He paid his way through by working nights and weekends at a nearby Cornelius warehouse. In the last year he has been instrumental in turning around our customer service operation—and saving the Tipton's account. And he has been champing at the bit to tackle our supply chain problems—all the stuff we've just been talking about."

"We get the general idea, Mary Ann." John Enright looked directly at Gan. "I'll ask you the same questions I just asked Ed. *Can* we, *should* we, and how the hell *do* we?"

"It can be done, Mr. Enright," Gan heard himself say.

"Call me John. And don't use that third-person tone on me. I wasn't asking a hypothetical."

"Sorry." Could they really pull it off? The nay-sayers had been just as persuasive as the gung-hoers, but Gan felt he had to answer "yes," if only out of loyalty to Mary Ann and Ed. And, of course, he was excited by this opportunity crisis—its risks and rewards. It was exactly the challenge he had always coveted. They had to go for it, like Geoff Mullins said. That's what life was all about. That's why he had been ready to quit today—and why now, suddenly, he wanted to stay on. Gan cleared his throat:

"In my opinion—yes, we *can* do it."

Ed thumped him on the back.

"And your plan?"

Gan stared down at his scribbled notes and ideas, some of which might impress, but all of which seemed to blur en masse. He cleared his throat again ...

"Give us one day." The voice was Mary Ann's, rescuing him. "I know time is critical. But if you could give Ed and Gan and me till tomorrow morning to draft a preliminary strategic plan..."

"Call it a crisis-management plan," Ed said.

"Okay, right. A plan to go after all this potential business while avoiding disaster. Till tomorrow morning. And, of course, we would welcome any and all input."

Enright looked around the table, got some nods. "Fair enough. You've got till tomorrow at eight. Everybody back here. You all heard Mary Ann's request. Please give her and her team the benefit of your best ideas. All agreed?"

More nods, a few chair scrapes.

"There's one more item on the agenda, so don't anybody leave quite yet. As most of you are aware, Ike Boone has at various times expressed interest in acquiring the Cornelius brand." Gan, for one, had not been made aware and found the news shocking and disorienting. Was Enright going to announce a takeover? But that made no sense in light of what they'd been talking about—or Rob Wylie's offer to hire Gan.

Enright went on: "Recently, with our ongoing financial doldrums, Ike's offers have been getting more frequent and, frankly, less attractive. But this morning, on the phone, he complimented me on the Bigger Scott endorsement and sweetened the pot considerably." Enright paused. "His offer was $33 a share." There was a collective intake of air. The figure was nearly double the current stock price. Even Gan, with his paltry options, would stand to make several thousand dollars. Others at the table must be contemplating real windfall profits—and weighing that certainty against the possibility of long-term earnings.

Why was Ike Boone offering such a premium? Obviously *he* was confident he could sell the heck out of Corn Dogs with the Bigger Scott endorsement.

Enright regarded them over steepled fingers. He still wasn't finished:

"There's a catch. It seems we've got 24 hours to accept, or the offer is withdrawn. Which neatly coincides with your deadline, Mary Ann. So let's restate your assignment: You and Ed and your protege have until eight tomorrow morning to convince me, and the rest of us, why we shouldn't sell the company."

— PART TWO —

MARY ANN DUGAN HAD LEFT THE MEETING SUPERCHARGED, rushing off to delegate everything so she could plunge into crisis mode—with Gan McManus, Ed Combs, and anybody else in the hierarchy of Cornelius Footwear they decided to grab.

"It's going to be a long day—and probably night," she'd told Gan. "Which reminds me, I'm going to requisition several pounds of Corporate's gourmet coffee. None of that cafeteria sludge for *my* team."

And she was gone.

Others dispersed more quietly. *Privately counting their stock windfalls*, Gan thought, in light of the revelation that Ike Boone, chairman of rival Zip Athletic Wear, had just sweetened his takeover offer—not so coincidentally the morning after Bigger Scott had won the U.S. Open and credited the victory, and his amazing comeback, to Cornelius' Corn Dogs.

Only three people remained in the conference room—John Enright, the CEO, Serge Saunders of Operations, and Al Hirschorn of Finance, their three heads together. *Talking takeover, no doubt*.

Except John Enright was one of the good guys.

Wasn't he?

Gan slipped out, feeling utterly adrift. Two hours before, jogging to work, he'd decided to jump ship—to accept the lucrative offer from Zip. In his mind, he'd already made the move north from L.A. to San Francisco—to a new title and new duties, a private office overlooking the Bay and bundled stock options. Now, incredibly, he was back on the leaky old *S.S. Cornelius*, being asked to redesign it before it was too late. Which it probably already was, no matter what grand logistical schemes he and Mary Ann and Ed could cook up overnight.

When it came time to actually implement the sweeping operational and cultural changes so desperately needed, wouldn't Gan be stonewalled? Wouldn't corporate inertia win out, as it always did at Cornelius? Did John Enright look like an executive eager to slug it out in the trenches, or to kick back and reap his rewards?

HEADING BACK TO HIS CUBICLE, GAN YIELDED to a stray impulse and detoured into a small, circular annex off the lobby. A center pedestal showcased a bronze figure of a male hiker with alpenstock, bald and full-bearded, muscled calves in uphill stride. Inside those sculpted boots, Gan conjured the prototype Corn Dogs inserts, handmade out of three kinds of leather, rubber, and shaped cork. It was an engineering process that anticipated the laminations of a modern running shoe.

The hiker, of course, was George G. Cornelius himself, outdoorsman turned manufacturer. According to company legend, the old guy had also been a seat-of-the-pants logistician. Back in the late 1930s, convinced of a war with Japan that would cut access to Southeast Asian rubber, he'd bought up a warehouse full of Brazilian wild rubber and kept right on cranking out Corn Dogs, along with combat boots for Uncle Sam. Old George would have been thrilled by Bigger Scott's comeback victory, Gan thought, not to mention the surprise endorsement of Corn Dogs.

"Wondered where you'd got to." Ed Combs stood in the lobby archway. "Communing with Our Beloved Founder?"

"Kind of. Looks like the end of the trail for the old guy, one way or the other."

"You mean if Cornelius becomes a division of Zip?"

"Right." From what Gan knew of Zip culture, once Ike Boone acquired all their patents, he'd cut every corner to make it cheaper. The final product would probably end up little more than a knockoff. Oh, the brand name might linger for a while, to squeeze the last drop out of Bigger Scott's endorsement, but George Cornelius' unique engineering concepts would be an early casualty of the takeover. And the trade secrets built into Corn Dogs would have vanished forever, just like the recipe for Stradivarius' fiddle varnish.

"Let's hear what the old guy has to say." Combs punched a button on an adjacent TV console. The screen blinked up an archival black-and-white loop of George Cornelius, standing at a blackboard and speaking in a scratchy twang:

"People who don't have toes can't walk or run," he was saying, pointing at a chalk drawing of a human foot. "Why not? Because there's nothing to grab the ground. Every person who runs in shoes is trying to grab the ground inside the shoe, just like you do running barefooted. My thought was, why not put something inside the shoe the toes can grab onto and make the shoe like the person was running on soft ground? So I got hold of a runner with good strong feet and had him run on the beach and then made casts of his impact prints, then smoothed those down to see what the grabbing mechanism really was, and where you want support in the shoe..."

"That's what it's all about, Ed," Gan said after the four-minute loop was over. "It's not about beating Zip, or being No. 1 in the marketplace—as desirable as those goals are—or even driving up the stock price and corporate profits. It's about keeping one man's vision alive," Gan tapped the dark TV screen, "and helping people to keep on doing all the activities they love. You heard what he said—'God made your feet to walk forever.'"

"You want me to say 'Amen'?"

"It's *me* I'm preaching to, Ed. I was gonna quit today. Heck, I was gonna quit five minutes ago. Go to work for Ike Boone, if you can believe that."

"Everybody likes to work for a winner."

"But we can't let him win, Ed. We gotta—"

Combs' cell phone went off. "He's with me," Combs said, mouthing *Mary Ann*. "In the lobby. You bet, we're on our way."

"She ready to go?" Gan asked.

"Her exact words were, *'Let's get ready to r-u-u-u-u-umble!'*"

IN THE CUSTOMER SERVICE CONFERENCE ROOM five minutes later, Gan told Mary Ann about his "epiphany" in the lobby. "You know, back in college, when I was working at a Cornelius warehouse as a flex-time picker, my feet used to kill me after a night on the cement slab. I'd get out of bed next morning still limping. I told the foreman I had to quit. He told me to take off my fancy tennis shoes and try a pair of basic Corn Dogs. It was a miracle! At the end of the shift, no pain! The company product put the bounce back in my step. Which is why I stuck around, I guess."

"Why do we need Bigger Scott?" Mary Ann said facetiously. "Let's build our campaign around Gan."

"All I'm saying is, we've got to make this work. We can't sell out."

"So what do we do to keep that from happening? I remind you, we have a little more than 23 hours."

"Gan has a good point," Ed Combs said, scratching his gray crewcut. "Let's not dismiss *why* we're doing this."

"You're not gonna start quoting General Pagonis again?" Mary Ann said in mock exasperation. The truth was, she was appropriately respectful of Combs' years of service under the legendary logistics wizard of Desert Shield and Desert Storm.

"My point is," Ed went on, "everybody in the company needs to buy into our mission."

"Starting with John Enright," Gan said. "We've got to get all the top brass more excited about going after this opportunity than how much they can pocket by signing their proxies over to Ike Boone."

"So what *is* our mission?" Mary Ann said, eyebrow arched, pencil poised.

"To help people stay on their feet, to keep playing all the games of their life. Something like that. The better we succeed, the more folks we help, the more we'll prosper."

"Okay," she made a bullet, "revamp mission statement. Spread the gospel. Next?"

"We need a two-tiered strategy," Ed Combs said.

"General Pagonis again?" Mary Ann asked.

"You got it. From Day One in Saudi, we had to address the immediate crisis, which required a highly defensive posture, but also look long term, to prepare for going on offense. Short term, long term. We can't lose sight of either one."

"Gotcha," Mary Ann said, writing rapidly. "We've got immediate logistical problems. Long term, we start looking at process redesign."

"You'll have to excuse me a minute." Gan stood up. "Before I can contribute, I've got a bridge to burn." He walked to the window, taking out his cell phone. Rob Wylie at Zip picked up quickly: "Gan the man! What's the good news?"

"I've decided to stay on at Cornelius, Rob. I'm just calling to thank you for the generous offer..."

"So, when were you going to tell me?" Mary Ann wanted to know when Gan rejoined them a moment later.

"This morning. I came in to resign. The Bigger Scott deal, and the chance to work with you and Ed on logistics, pretty much changed my mind."

"Only 'pretty much'?"

"George Cornelius clinched it."

"Except," Ed Combs said, "if Enright caves in, we could *all* end up working for Zip."

"Then let's get busy. Take a look at this." Mary Ann placed a printout between them, with what looked like Chinese characters. Gan bent closer. It was the office-delivery menu from a nearby Oriental deli. "They also do dinners."

"LET'S RECAP," MARY ANN SAID SEVERAL HOURS later, flipping the pages of her legal pad. She started down the early bullet points:

"Form in-house cross-functional leadership team—"

"SWAT team," Combs reminded her.

"—with top managers from all departments....

"Revamp mission statement." Mary Ann glanced over her reading glasses at Gan. "Remember, don't give me any feel-good, New Age baloney. We're not doing this out of altruism, or to cure grandma's bunions. At least *I'm* not. My goal is to put the price of Cornelius common so high it'll leave Ike Boone's takeover offer in the dust." She moved to the next items:

"Explore idea of offering Bigger Scott percentage deal to be Corn Dogs pitchman....

"Design major ad campaign to exploit Scott endorsement. Mix footage of George Cornelius with Bigger Scott on TV..."

This wasn't just a matter of marketing, she reminded them, but a logistical priority. The longer Scott's endorsement stayed fresh in consumer memory, the more time they were buying to get fresh product flowing into stores.

And they'd *have* to move faster. Five months was typical turnaround time on a new retail order—*if* everything went smoothly with their existing manufacturing plants in China and Thailand, and with their shipping connections across the Pacific.

But five months from source to shelf was just too long—especially when the window for Corn Dogs, wide open now, could close quickly. They could end up with unsaleable product backed up in the pipeline all the way to Asia.

An advanced planning tool would help predict demand and plan daily manufacturing capacity. But that was long range. In the meantime, their demand forecasting would have to rely on educated guesswork, based on input from Geoff Mullins' sales reps and constant feedback from focus groups and market surveys.

"What we really need," Gan suggested, "is to get connected to point-of-sale information in the merchandising systems of all our big accounts—either through EDI or the Internet. That way we can spot trends faster and respond quicker to what's happening in the retail environment."

"In the meantime," said Ed Combs, "why not do the old-fashioned thing? Let's set up a boiler-room to call each of our main stores, say every Monday morning, and find out what's been selling and how much?"

"Our top-tier retailers will need to buy into that idea, Ed," Mary Ann said, "and they will, if they see enough trending happening so they know they're going to make money on it. Let's set up some meetings."

She added bullet points.

"Back to that five-month lag time," Gan said. "How about switching to air freight?"

"You beat me to it," said Combs, whose expertise in Far Eastern cargo was acquired during two Vietnam tours as a transportation officer. "We're dealing with a volatile fashion trend, right? No way every shipment can take nine or 10 extra days on the water—maybe more, if you hit a typhoon."

Air freight became another bullet point.

"What about the cost of sending everything by air?" Mary Ann asked.

"We could still use containerships for unfinished goods," Combs suggested. "You know, that idea Hal Matsuura talked about—mass customization, building shoes to a certain level in Asia, shipping those in containers, then sizing and finishing over here? Again that would allow us to react faster to market changes because we'd have half the product already built."

"The old assemble-to-order idea," Mary Ann said, making another bullet.

"That's standard procedure for all the laptop makers in Taiwan," Gan said. "They fabricate basic designs, then let their customers—Dell or IBM or Compaq—tweak them right in the assembly plants, adding or removing options. That lets vendors brand and diversify their product lines—and get to market quickly."

"Don't they also ship laptops direct to their vendors' big retailers?" Combs asked. "That's something else we might copy—air-freighting Corn Dogs to big accounts straight from Asia. That gets us to market a *lot* faster —"

"*And* it cuts warehousing, shipping, and handling costs," Gan added.

Mary Ann made the notation, but her mind had drifted back to an idea surfaced earlier: "You know all those half-finished shoes, which we ship over here in containers? Why not do our final production cycle—sizing, adding the trim package or whatever—in a Foreign Trade Zone? There are plenty of FTZs around the Harbor. We wouldn't go through customs, or pay import duties, till the shoe was actually finished and shipped to market."

Ed and Gan agreed this was worth exploring. But there were more fundamental problems—two at least—which they'd been tiptoeing around the past several hours. One of these was manufacturing capacity. Or lack thereof, according to Alex Ordonez, the executive in charge.

"I think it's time we paid Alex a visit," Mary Ann said, capping her pen and closing her notebook.

"I'VE BEEN THINKING ABOUT IT EVER SINCE the meeting," Alex Ordonez said, as they settled around a corner table in his office. "How can we make more shoes?"

"What did you come up with?"

"A million elves with little hammers," Ordonez said deadpan. Nobody laughed. "Actually, I haven't come up with a solution. Outsourcing is our only hope, but, like I said this morning, most of the Asian contract manufacturers are already tied up—a lot of them by Zip."

"Somehow we've got to untie them," Gan said. "*We've* been talking about outsourcing, too, all morning—but for our distribution network. There's just no way we can take all this Asian inventory into our existing warehouses and then reship. The obvious answer is to find a 3PL with global expertise and existing infrastructure, which we sure as heck don't have, not to mention logistics being one of our core *incompetencies*. So let *them* take the demand based on what retailers are saying they're selling and ship accordingly. But somehow we left manufacturing out of our thinking."

Ordonez smiled. "It would be great if we could outsource the whole deal." He waved at a wall map of Asia behind him. "Scale up our own factories as much as we can, then if we can somehow scrounge up a bunch of Asian suppliers that can make shoes—third-party manufacturing sites all over the place, from Singapore to Ho Chi Minh City. Start fanning out production. Give Ike Boone a run for his money over there." He gave a bleak smile. "At least we can try."

"The other obvious advantage to that," Gan said, "is if the trend dies, God forbid, and we need to shut down production fast, we just close out our contracts with the third-party manufacturers and logistics providers, and get out unscathed."

"We'll need an on-the-ground team," Ed Combs said. "While Alex goes searching for manufacturing sites and gets them up and running, someone will need to work directly with our logistics people in Asia, from whatever 3PL we pick, to move product out of manufacturing as quickly as possible."

"Either of you guys free?" Ordonez asked. "I could sure use your input over there."

"They're both free," Mary Ann said. "If we can sell John Enright."

"WHAT DO YOU GOT?"

John Enright, their white-haired CEO, punctuated the question with an anticipatory hand clap, like a sultan summoning his next concubine. It was eight the following morning, the deadline for presentation of their plan to convince Enright not to sell the company to Zip. For whatever Enright decreed, all knew, the Cornelius stockholders would ratify. There was a curtain-time tension in the conference room, the same faces looking down the long polished table at Mary Ann Dugan, again flanked by Ed Combs and Gan McManus. All three were exhausted, running mostly on fumes and caffeine. Alex Ordonez remained mid-table, next to his immediate boss, Serge Saunders of Operations, but Mary Ann now counted Alex solidly on her team.

Now or never. She cleared her throat and launched: "You'll find the basics of our plan in these handouts." She patted a stack of papers beside her. "But since they're talking points, we'd like to talk you through them first…"

They took turns—all four of them, with Mary Ann going over the business logic, Alex handling manufacturing, Ed and Gan the 3PL distribution component. Gan closed with his personal appeal—reminding them that Cornelius had something of unique value to offer the world, a vision that could empower them all not merely to preserve the company, but to grow it dramatically.

"Nice words," remarked Al Hirschorn the instant Gan sat down, "but let's get back to the outsourcing. Your timeline, it doesn't make sense. Where do you budget time for writing a requirements document, evaluating logistics providers, sending out RFPs, evaluating responses, making site visits?"

Mary Ann jumped in: "Gan has been doing all those things, in an ongoing informal way, the past six months. I've got a file full of his memos and recommendations, and you've been on the distribution list, too, Al. Ed has contacts with the biggest 3PLs, going back for years, and so does Alex. The four of us had our short list of candidates by three yesterday afternoon, our basic requirements document boiled down to bullet points by four, and we've been making phone calls ever since—and I'm talking all night long."

"I suppose you've already picked a provider?" John Enright said, with the faintest hint of a smile.

"We have a recommendation," Mary Ann said. "A team from Brannan Logistics is ready to fly down from Seattle on their corporate jet this afternoon, to make a pitch for our business."

"Brannan isn't a top-tier 3PL," said Al Hirschorn, turning to John Enright. "No big provider is going to consider this kind of interface, in this time frame."

"Wait a minute, Al," Enright said. "I'd like to hear what they have to say. Did you folks talk to Jeb Brannan personally?"

"He's coming himself," Mary Ann said. "Turns out he wears Corn Dogs, too."

The Brannan name seemed to tip the scales a bit, Gan thought, except with Al Hirschorn. Gan definitely felt an energy shift in the room, a sense that their plan *could really work.*

He was right. On an informal table vote, Al Hirschorn of Finance was the lone naysayer. "It might work, it might not," Hirschorn said. "But Ike Boone's offer is a sure thing. And too damned good to pass up."

"Who says we're passing it up?" Enright countered. "If Jeb Brannan can make a persuasive case, and Alex can scare up the manufacturing capacity, and Mary Ann's SWAT team strategies work even half as well as her little dog-and-pony show this morning suggests, Ike Boone will have to reconsider his deadline and sweeten his bid. I vote we go ahead and execute, build the business dramatically, invest in it. And you can bet Ike Boone won't go away."

So Enright—the only vote that really mattered—was obviously with them. They'd won! And yet Gan, Mary Ann, and Ed Combs left the meeting feeling oddly deflated, wishing they'd gotten a more wholehearted endorsement.

"It sounds like no matter how great a job we do turning things around," Gan said in the down elevator, "our efforts will only culminate in a more lucrative takeover down the road."

"Then we'll just have to change Enright's mind about that by our results," Mary Ann said. "Now, we've only got about five hours before the Brannan team arrives. I don't know about you guys, but I'm going to take a nap."

THE CALL TO PRAYER FLOATED ACROSS Kuala Lumpur, overtaking Gan McManus on his early-morning run through the manicured acreage of KLCC Park. In fact, as he glanced over his shoulder, the amplified sound, drowning out the slap-slap of his Corn Dogs, seemed to be coming from the soaring, minaret-styled spires just behind him, the Petronas Twin Towers—the world's tallest buildings. Gan checked his watch. He was already sweat-soaked from jogging in KL's legendary humidity, but in twenty-five minutes he would be showered, dressed, and downstairs in the Mandarin Oriental Hotel, directly ahead on the other side of the park. He and Alex had a breakfast meeting with representatives of Hai-Tek Industries, which, despite its name, specialized in fabricating plastic sandals and rubber thongs. He hoped to persuade them to take a piece of the action on Corn Dogs.

In the two hectic weeks since Enright gave the go-ahead, Gan had been all around Asia with Ed Combs, Alex Ordonez and a multilingual team from Brannan Logistics. But so far they'd located only two, possibly three, new manufacturing sites here in

Malaysia, and were negotiating with another plant in Dhaka, Bangladesh. But it just wasn't enough. Gan felt a growing frustration, seeing their entire plan on the verge of unraveling simply because they couldn't get enough damned Corn Dogs made.

It was looking more and more like they should have jumped at Ike Boone's first offer.

There was an abrupt vibration on Gan's hipbone. *His* summons—not to prayer, but just as imperative. Every member of the Cornelius team carried global phones, linking them to each other and back to the War Room in Los Angeles. Gan unclipped his, flicked it open and, without breaking stride, huffed his good morning.

"Gan! I'm sorry! I'll call back—"

"It's okay, Mary Ann. That rapid breathing you hear is just me jogging. No Oriental hijinks, I assure you. Is it still yesterday in L.A.?"

"Gan, the reason I called—"

"How's the media blitz going?"

"That's why I called. We got good news and bad news."

"Start with the good."

"Enright got a call from Dave Flynn at Corners."

Gan, though standing still, now felt his pulse begin to race. By most estimates, Corners was now the world's third-largest discount chain. Which was great for Ike Boone because Corners stocked Zip's budget line, but zero Corn Dogs.

"Is Dave Flynn giving us an order?" Gan asked.

"You could say that. What happened, based on Bigger Scott's endorsement, is Dave Flynn went out and bought a pair of Corn Dogs—and started jogging again for the first time in years."

"Hallelujah. What kind of numbers are we talking about?"

"We're still crunching them. Flynn's talking about replacing Zip with Corn Dogs in all the Corners' outlets—worldwide that's more than one thousand!"

The implications were dizzying—and indeed Gan felt giddy. With the Corners account in their pocket, not only could they do production planning with confidence, but he and Alex could stop begging all over Asia for manufacturing capacity. Hell, they could lure away some of Zip's big contract suppliers. Even better, they could plug directly into Corners' global supply chain, releasing Corn Dogs at the factory door in Asia, and saving Brannan for smaller accounts.

"Mary Ann, that's not good news. That's fantastic news. It solves absolutely everything!"

"I didn't give you the bad news yet."

"Couldn't matter. Not with Corners in, excuse the expression, our corner."

"I'm afraid it could, Gan. We just learned that Bigger Scott has signed an exclusive multi-million-dollar endorsement deal with Zip."

Gan swore, then regrouped. "Hell, we don't need Scott any more. We got Dave Flynn."

"Not according to Enright. The Corners deal hinges on the Scott endorsement."

Gan swore again. There had to be a way out. "What about Scott's speech after the game? The whole world heard what he said about Corn Dogs saving his career. Zip can't stop us from using that. It's news. Did you check with Legal?"

"We just got through talking with Holly Needham. She said if we use Bigger in any kind of media campaign, you can bet Zip's attorneys will drag us through the courts. And their pockets are a whole lot deeper than ours."

"What do we do?"

"Enright says we stop everything and go back into crisis mode." Mary Ann paused, then concluded: "Come on home, Gan."

"I WON'T LET IT HAPPEN!"

Gan McManus slapped the table, rattling the espresso cups. "Dammit, we had the prize in our hands—manufacturing capacity, a bridge solution to our supply chain dilemma, the works! And now it's all whisked away by Ike Boone and his checkbook!"

"Bravo!" Ed Combs said from across the table. "I've been waiting for you to get off your even keel, Gan. How about you, Alex? Ready to vent, too? Come on. I've heard you bellow orders clear across a warehouse."

"I'm screaming on the inside." Alex Ordonez, Cornelius Footwear's stocky production chief, just managed a smile.

The three men were having coffee in the lobby cafe of the Mandarin Oriental Hotel in Kuala Lumpur—and all three were still in psychic whiplash from the morning's devastating one-two punch, delivered in Mary Ann Dugan's transpacific call. In an incredible sequence of events, Cornelius had first landed the Corners account at the direct expense of rival Zip, then lost the Bigger Scott endorsement rights to Zip, which effectively killed the deal with the worldwide discount chain.

"I guess it was just too good to be true," Alex said.

"No, it wasn't!" Gan insisted. "Sure, the Corners deal fell out of the sky right into our laps, but we've been working our tails off to be in position for exactly that kind of big break—and, by God, we deserved it! Dave Flynn at Corners has to be aware how this dormant little company with one hell of a product suddenly woke up and turned aggressive. You know Corners' reps have seen us hustling all over Asia, fighting to pry manufacturing capacity away from Ike Boone and being blocked at every juncture. Dave must have seen we were worth placing a bet on—"

"Except he just put his money back on Zip," Alex said.

"So we gotta convince Dave we're *still* a good bet—long term and short—that we're not going to lie down and play dead for Ike Boone or anybody. We gotta stay aggressive," Gan said.

The kid had turned into a real fighter, Ed Combs thought, refusing to acknowledge he was licked.

"Well," Combs said, "if it's turned into a war of checkbooks, we could offer Bigger Scott more money."

"Write him a 'bigger' check, you mean?" Alex managed another faint smile. "I'm for it. With the Corners business in my fist, I won't have to go begging for Asian contract suppliers. A lot of those factory honchos who took a pass on us these last weeks would suddenly find openings on their schedules. Heck, I could have them bidding against each other on price and delivery dates."

"You know, there may still be a way to get Bigger Scott back on our side where he belongs," Gan said. "But for now, according to Mary Ann, Enright is against raising the ante. Our checks just don't have room for as many zeroes as Zip's."

"Ike must have promised Scott the moon," Ed Combs said, "mainly to keep us out of Corners."

"Face it, the old buzzard outslicked us," Alex said. "He BS'd Bigger Scott."

"There's gotta be something," Gan said.

"Well, we could be philosophical about it," Alex said. "Because, in a way, Dave Flynn was just another Ike Boone. The Corners deal would save our hides for now, but down the road we'd find ourselves totally dependent on them. We'd just be swallowed by Dave Flynn instead of Ike Boone."

"No way, Alex," Gan said. "The Corners deal is only a means to an end. I would never let us rely on a single distribution outlet for Corn Dogs, no matter how big it is. Here's the way I see it."

Signaling the waiter for another espresso, Gan launched into a rapid-fire explanation of his plan. Piggybacking on the Corners distribution network would supply a short-term "crisis" fix, he said, though still requiring their own best logistics efforts and the help of Brannan. The Seattle-based 3PL would also step in to handle the increased demand from Cornelius' customers other than Corners.

"Sure, we want to get big," Gan emphasized, "but not clumsy big and pushy, like Zip. Zip's mistake is that it buys a ton of product to get the cheapest price, then can't move it. So it dumps excess inventory on its contract manufacturers and vendors."

"And manufacturers over here get flooded with returned Zips," Alex added, "which, if you ask me, has more to do with poor product design than quality control."

"But Ike Boone doesn't care," Gan said. "He ties up suppliers over here and floods retail outlets with his shoddy shoes, keeping competitors out. He's turned Zip into the 800-pound gorilla pushing inventory to vendors to hold until Zip gets paid. Meantime, from what I've seen, Zip is slow to pay its own contract manufacturers and vendors."

"Another reason they'd be quick to defect if we brought in Corners," Alex said. "Dave Flynn pays on time, while I bet Ike plays the float—even making Bigger wait for his royalty checks."

"Hold on now, Gan," Ed Combs said. "Let's say we've got your 'short-term crisis fix' in place, thanks to Dave Flynn and Corners. Now give us your 'long-term fix.' How are you going to wean us away from dependency on Corners."

"*You* tell *me*," Gan said. "The short-term benefits of piggybacking on Corners' distribution network are obvious. But how can we benefit long term?"

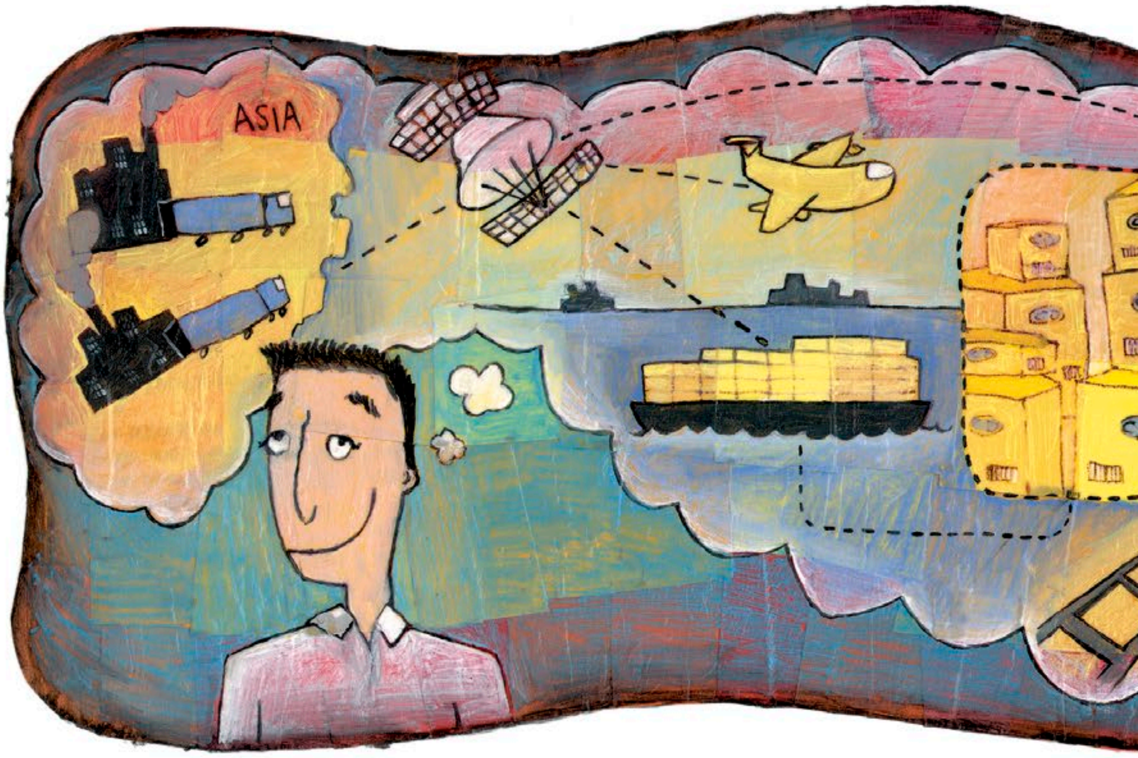
"You fixing to steal all their supply chain secrets?"

"Call it reverse engineering," Gan said with a grin. Having Corners as a customer, he explained, would allow them the unique opportunity of peeking inside the discounter's sophisticated supply network in order to meet its demands better than any competitor ever could. It would be a constant learning process, as their relationship with Corners evolved.

With his mind's eye, Gan conjured the giant retail chain's world-class distribution system. In a descriptive sense, of course, the vision was "real"; the only imaginary part was painting Cornelius into the picture. But, ever since the "good news" portion of Mary Ann's morning call, Gan had been unable to keep Corn Dogs out of that picture. They kept flowing massively through the Corners' supply chain and ending up, just in time, on clearly envisioned shelves, thanks to instantaneous point-of-sale data and inventory turnover feedback that triggered all purchasing, production, and shipping decisions.

Gan could see the fluorescent-bathed acreage of a typical Corners Discount, the entire Corn Dogs line arrayed down heavily trafficked shoe aisles, with the good ol' boy grin of Bigger Scott on the endcaps, putter in one hand, basic walking shoe in the other. And beyond the walls of the mammoth, boxy store Gan could visualize the globe-spanning supply chain that fed it and all the hundreds of other Corners outlets. He could see ocean and airfreight container trucks backing up to the loading docks of Asian manufacturing sites—sucking finished Corn Dogs into their distribution system.

He visualized the great container ports of Singapore and Hong Kong, Kobe and Kaohsiung, knew from his early morning research that Corners imported 100,000 "cans" a year from Asia—the kind of cargo volume that got the very best rates from



carriers. (By partnering with Corners, Cornelius would be able to plug into long-term contracts with transportation carriers for its *other* customers, as well.)

Gan conjured one of those floating steel leviathans—eight levels of containers below decks, five levels above, 16 or more across—smashing its way east at 21 knots on the Pacific run, ferrying Corn Dogs to market. Streaking overhead would be a 747-400 freighter, its belly full of more Corn Dogs—122 tons worth packed into igloo containers.

Getting all that product to the right stores would be Corners' challenge initially, not Gan's, but he'd make it his business to acquire expertise as quickly as possible. He knew that the shoes would be already packaged, labeled, and bar-coded by Cornelius' manufacturers. Within hours of docking, the big boxes would be flowing off the pier on wheeled chassis hauled by trucks or double-decked on rail flatcars, destined for the main railheads—Chicago, Memphis, Atlanta, New York.

Corners had its distribution centers hub-and-spoking every sales region, so it could service its stores with its own gigantic truck fleet…

"Hate to rain on your imaginary parade, Gan," Ed Combs said, "but how the heck can you adapt Corners' billion-dollar solutions to *our* penny-ante operation? I hear the computer room in their headquarters is the size of an average warehouse, and they maintain one of the largest civilian databases in the world, with a 65-week rolling history of each SKU, how many bought and sold in every region, district, and store. Shall I go on?"

"We'll do exactly what they do," Gan said, "but on a smaller scale. Like you say, information at checkout at each Corners' location is stored locally, aggregated by product, and transmitted electronically to that humongous database at Corners' HQ, which allows Corners to analyze replenishment needs and buying habits. So we reverse-engineer a scaled-down version of their system for our own use. That, coupled with Brannan's software, will allow us to plan ahead, forecast product demand, and react quickly."

Another way Cornelius could adapt Corners' sophisticated systems, Gan went on,

was in automating production decisions. “Obviously, we don’t have the resources, like Corners and the other big players, to get all our big suppliers on EDI. Face it, the bulk of our manufacturers—and even Zip’s—are still relying on phone and fax to move numbers. Am I right, Alex?”

“Right, but at least we got rid of our telex machines,” Alex chuckled.

“We can do better than that. With Corners, we can pry manufacturing facilities from Zip. Most of that capacity will be for Corners, but some of it we can use for non-Corners accounts. What we need is a Web ‘black box’ to translate EDI advice to HTML-readable information, so even the most unsophisticated contract manufacturers can match product flow to demand flow, just like Corners does.”

“And Brannan can build it for us,” Ed Combs said, “right, since they’ll be serving as the back end for all those non-Corners customers anyway?”

“Exactly,” Gan said. “And Mary Ann’s customer service group can hold hands with those key accounts, so we’re capturing all the necessary POS information. Of course, as far as production goes, we’ll have to team with Brannan to manage exceptions and monitor inventory flow to make sure they meet demands.”

“Back to that ‘black box,’” Alex said. “You’re saying we’ll be able to convert *all* our supply chain participants from fax or phone to ‘e’? Instantaneous access to readable information, eliminating language and time zone differences?”

“Most of that is doable, Alex,” Gan said. “An EDI-Web converter was one of the bullet points in the requirements document we sent Jeb Brannan the night before we made our big pitch to John Enright. Brannan’s EDI-Web converter will map EDI and e-mail messages right to our web supply chain system. That will take care of the sophisticated customers and vendors.

“But, Brannan also has a solution for our customers and vendors still using fax and phone—voice recognition software that can translate voice commands and keypad prompts into HTML code,” Gan said. “Backed up by our usual customer service folks.”

“As far as fax, Brannan has a team in place that can take inbound faxes from our customers and re-key them as close to real-time as possible into our web pipeline,” he added. "At the same time, Mary Ann's team works with the customers using faxes—one by one—to wean them off old technology and onto the Web."

With input from his colleagues, Gan began jotting down other value-added services he expected from Brannan Logistics: For the first blast of product to market, the 3PL needed to arrange air shipments, then monitor any strategic pulses and emergency situations that might impact product flow and/or demand. Brannan would also arrange for and tweak logistics information technology so each member of the Cornelius team, pertinent contract manufacturers, and larger vendors would have real-time visibility of product flow via the Web, Palm handheld devices, and their desktops. Again, they weren't asking Brannan for anything revolutionary. The 3PL already had this capability; Cornelius only had to plug into its existing system.

And, as before, Brannan could continue to field a multilingual team at key manufacturing sites here in Asia to manage distribution and training.

Alex held up his hand to stop Gan from proceeding. "You're saying Brannan would teach our manufacturers supply chain expertise and technology?"

"Yes," Gan said.

"They'll love that! I mean, Zip shares, excuse the expression, *zip* with its suppliers. And believe me, they're tired of being jerked around by Ike Boone. What they really want," Alex said, "is to be treated like business partners, not commodities. And it's not just a matter of respect. By forging long-term, close relationships with their clients, manufacturers would be able to maximize profits by being better able to plan for demand."

"And that kind of partnership would give us another advantage we could offer Corners that Zip can't, or won't," Gan said. "More reliable product flow."

"We should have been working on all this stuff long ago, with or without Corners," said Alex. "We could have taken market share away from Zip."

Gan nodded. "I guess it took a crisis to shake everybody up."

There were lessons to be learned all around, the three men agreed.

"But we'll never benefit from any of them," Ed Combs said, "if Enright can't rescue the Corners deal and decides to go ahead and sell the company to Ike Boone. Gan, me lad, I'm afraid you've been preaching to the choir. Our beleaguered CEO is the one you need to convert."

"And you'd better start preparing your sermon." Alex checked his watch. A Web teleconference with the home office was set for that night.

AT ELEVEN P.M.—EIGHT "YESTERDAY" morning in L.A.—Gan sat by the window, turning his back on the soaring, fairytale lights from the Petronas Towers, hunched over his notebook PC, microphone plugged in. A dozen participants appeared on screen, represented by their company mugshots. Basically the same gang Gan had walked in on that fateful morning to give notice and learned about Bigger Scott sinking the incredible hole-in-one, winning the U.S. Open—then crediting Corn Dogs. Only now, a little more than two weeks later, the ball had lipped out.

John Enright's recap of events was short and bleak. With Bigger Scott defecting to Zip, Dave Flynn of Corners was regretfully withdrawing his offer.

"Darned right I believe in Corn Dogs," Enright quoted the Corners' chairman as saying, "but they gotta be a guaranteed velocity item to find space under my tent, and that means we gotta have Bigger Scott out front beating the drum."

"What about Dave Flynn beating the drum instead?" suggested Holly Needham. "Why not build an in-store campaign around his *own* endorsement?"

"Dave works hard at maintaining a low profile," answered Libby Skidmore. "He pays his publicists to keep his face *out* of the media."

"Flynn's own endorsement won't work anyway," Enright said. "Corners needs Bigger to propel its sports department from an also-ran to a competitor to the leader—Sports Wizard. Without Bigger, that initiative is dead in the water."

"There has to be some way to salvage the Corners' deal," insisted Serge Saunders of Operations. There was an uncomfortable stretch of silence before Gan, pulse racing and mouth dry, jumped in:

"Let's look at what *else* we can offer Dave Flynn that Ike Boone can't…"

Gan began spelling out for Enright and the others the solutions that he, Alex, and Ed had been passionately discussing in the hotel café. But it was impossible, staring at a static Web conference home page, to get a sense of the "room" and gauge his effect. Had he spoken for 10 minutes or 15? He seemed to be racing through his talking points—and suddenly he was done. He felt his voice run down. His "sermon," he thought, wouldn't have brought many converts.

John Enright's voice filtered through the PC speakers: "An intricate and elaborate plan, McManus. I congratulate you. But the fact is, we need Corners to get any of it off the ground. And we need Bigger Scott to get Corners.

"I'm afraid our fallback position isn't as good as it was three weeks ago either," the CEO went on. "Ike Boone hasn't withdrawn his takeover offer, but he lowered it considerably. The initial $33 a share is off the table. The figure is now $24." A pause. "I haven't decided if I'm going to recommend acceptance…but whatever we decide, there's no reason for any of you to extend your Asian trip. Start packing. We've booked you back on the first flight out tomorrow."

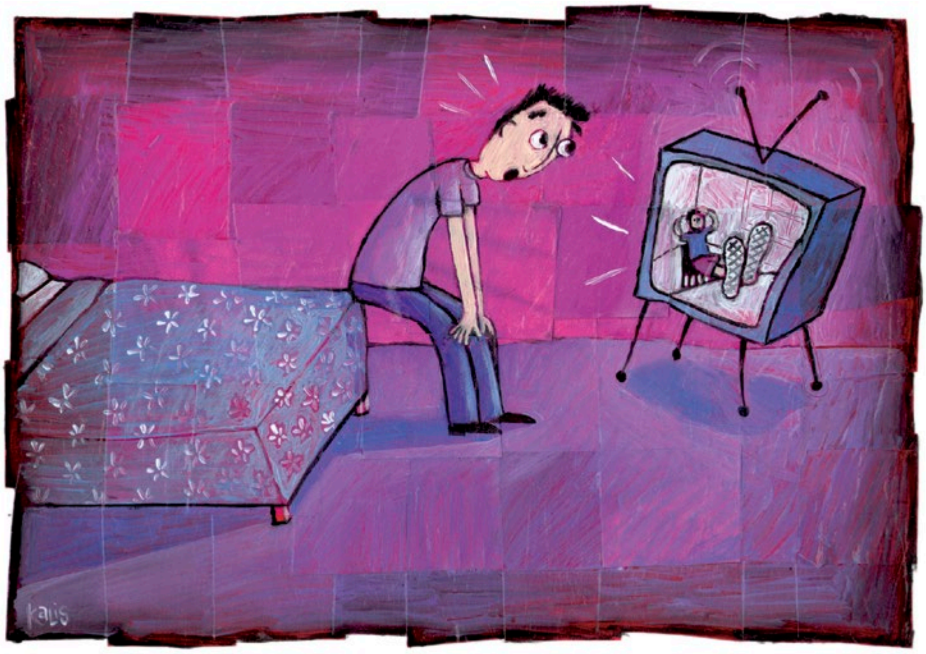
GAN WAS DRAFTING AN ENDLESS MEMO IN HIS mind, with a million bullet points, all detailing what had gone wrong. The bedside clock showed 3:47. Why fight it? He could sleep on the plane. Twenty droning hours, with a stopover in Taipei. He sat up, switched on the light.

What a fool he had been! And it all traced back to that first morning, getting caught up in the conference room euphoria over Bigger Scott. The smart career move, obviously, would have been to act on his decision to defect to Zip. Too late now. What kind of slot would Zip find for him after the takeover? Not likely as a cutting-edge logistician. Would there even *be* a slot for him?

To turn off his brain, he turned on the room TV, remote-surfed through a martial arts flick, a fast-talking Malay car salesman, Fantasy Island, a bald geezer jogging through the woods, a Japanese animé cartoon—go back!

The old jogger was Ike Boone! He wore gray sweats, and had a towel around his neck like he was Rocky Balboa jogging through the streets of Philly. His gravelly drawl came in over the video: "I like getting up before the sun—or my rivals." A mini-logo at screen bottom read "Many Mansions." One of those celebrity lifestyle shows.

An upper-crusty voiceover took over: "Ike Boone typically logs 16-hour days,



keeping his company on the extreme cutting edge. But when it's R&R time, Boone the Tycoon likes to kick back in this thousand-acre wooded estate in Marin County, California, just a half-hour's drive north of Zip's headquarters in a San Francisco high rise."

Ike again, with a deep chuckle: "It's a pretty cool place to road test the company product."

To the strains of Willie Nelson's "On the Road Again," the screen flashed to a close-up of red, white, and blue Zips pounding blacktop. Ahead, intertwining oaks provided an ornate natural frame for a Renaissance palazzo with a pillared portico.

Ike trotted up marble steps and high-fived his waiting trophy wife. The camera followed him down a museum-like corridor into a book-lined office, where he sank into an executive chair and levered his Zip-shod feet onto the corner of an antique desk, then proceeded to share snippets from his rags-to-riches life story.

Gan got suddenly excited. It couldn't be! He squinted, moved closer. But it was! Absolutely positively!

He snatched up his global phone, triggered a speed-dial sequence.

"Mary Ann, it's Gan. You sitting down?"

"At my desk, why? Shouldn't I be? And for that matter, shouldn't you be sleeping? Or packing?"

"I'm not packing Mary Ann. Because I'm not leaving. None of us are. Not yet anyway."

"Gan, what are you saying? You heard Enright."

"Enright doesn't know what I know now. I want you to set up another Web conference for tomorrow morning."

"Your time or ours?"

"I don't care. As soon as you can mesh schedules and round up the troops. I think Ike Boone just handed the ball back to us."

SEVERAL HOURS LATER, NEARING THE END OF a smoggy afternoon in L.A., the sixth-floor corporate conference room was packed, all eyes on the big-screen projection of the Web conference page. A half dozen more were dialing in from around the world, three from a hotel room in Kuala Lumpur, where it was 7:45 a.m. (after a sleepless but productive night for Gan).

At precisely 8, Mary Ann Dugan launched: "Last night, Gan McManus saw something on TV that, he believes, can tip the scales dramatically back in our favor. He promptly canceled his flight home, and I managed to get hold of the footage, thanks to an ex-college roommate who works in the L.A. bureau of a cable news outlet. The folks in this room can look at the big screen, while those of you dialing in can watch your Web media windows."

Mary Ann keyed her laptop, projecting the streaming video of Ike Boone jogging around his private Shangri-la.

"Is this your idea of a joke, Mary Ann?" John Enright asked.

"Wait," said Mary Ann. She let it roll, then froze-frame as Boone's Zips were hoisted to his desk, enormous on the screen.

"Will everyone take a close look at the bottom of those running shoes?"

"Those are *our* soles!" Surprisingly Al Hirschorn, the CFO, had spotted it first, but several others were right behind, including Enright. The distinctive Corn Dog herringbone sole pattern was unmistakable, fixed on the big monitor.

"The old so-and-so has infringed our patent," said their corporate counsel, Holly Needham. "This one we *will* litigate."

"Worse than that," Gan's voice came through on the room speakers. "Or better, from our standpoint. Ike Boone hasn't glued Corn Dog soles on a pair of Zips. He's wearing our shoes with a Zip logo *decaled* on the side! I'm not sure there's anything to litigate, Holly. I don't think Ike's selling them. I assume they're just for his personal use, and he doesn't want anyone to know he's wearing our shoes."

"Why would he do that?" asked Hal Maatsura of IT.

"Because they're *better* than his," said Mary Ann.

"It could be just that simple," Gan said. "I did a Nexis-Lexis search and pulled up a story from several months back about Ike suffering from plantar fasciitis and giving up tennis."

"If we can't litigate," Holly Needham said, "just what are you proposing, Gan? Blackmail? Extortion?"

Enright waved his hand dismissively. "Don't be absurd. I mean, this is an interesting bit of gossip, no more—hardly worth a special conference, Mary Ann. There's no way I can go after Ike Boone on this, without damaging any takeover deal he might consider."

"With all due respect, Mr. Enright," Gan broke in, "I don't think you're quite getting our point. Ike Boone's not who you should be going after. At least not yet."

"Then who, exactly, *do* we go after?"

"Bigger Scott."

"Scott's in Ike Boone's pocket," Holly Needham said. "What's the point in talking to him?"

"Because Ike Boone can bury something like this, or spin it, or just stay under the radar until it blows over. He's a businessman. But Bigger Scott's going to be the public face of Zip footwear. The one that everyone who plunks down $80 for their shoddy product sees. He's a public figure, and he needs to be well regarded by the public. Does he really want to be backing a product that isn't even worn by its own CEO?"

"Why should he care," Enright asked, "with the big paycheck Ike Boone's giving him?"

"That's what I thought, too, when Zip offered *me* a big paycheck."

"I beg your pardon?"

"Three weeks ago—the very day this whole Bigger Scott thing broke—I came to work to resign from Cornelius and go work for Zip. More money, more perks, the whole package. Plus a chance to put my logistics ideas to work for a change. But I couldn't go through with it. I knew our product was superior to Ike Boone's, Mr. Enright. We *all* know it. I look at that statue of George Cornelius, and I'm inspired by all the things our products are that Zip's will never be. Bigger Scott knows it, too. He knows we saved his golfing career. He just needs a little reminding—from you."

"*Me?*"

"It has to be you. He'll listen to you—he knows what he owes Corn Dogs. Remind him how they sustained him on the golf course and resurrected his career. Let him know that Ike Boone knows it, too. Show him the video so he can see why Boone's doctoring our shoes to look like his, so he can wear the best damn product on the market. And ask Scott if that's the kind of man he wants to be speaking for...and the kind of products he wants his name and face to represent. You might just sort of mention that you know his endorsement deal leaves Zip room to bail when the shoes don't move—and you know they won't. So the endorsement won't be worth the paper it's printed on. Meanwhile, Scott's currency for endorsements will be devalued."

There was a long silence. Was Enright at least thinking it over? Gan wondered from nearly 9,000 miles away, staring at his laptop.

"You make some good points, lad," Enright finally said. "But the man won't walk away from that kind of money for nothing. And we can't match Ike Boone's offer."

"Give him stock." It was CFO Al Hirschorn's turn. "If we succeed, he's rich. If Zip buys us, he's still rich. It's his golden parachute. He'll see it's better business sense to sign with us."

"Ike will fight like hell on this," Enright said.

"Not this time he won't," Mary Ann said. "He'll want this kept quiet. And he'll want our help to make damned sure it *is* kept quiet. Once you've got Bigger Scott on your side, Ike will have no choice but to release us. But it's up to *you* to convince Bigger Scott."

Gan had to sweat out another long pause. Then: "OK. McManus, you and Mary Ann have sweet-talked me yet again." Another pause, then Gan heard Enright's chuckle. "I only hope I can be half as persuasive as you are."

GAN LIFTED THE LID ON A BOX OF NEW business cards. New title, “Logistics Manager.” New office, with a window and a door—which was suddenly pushed open. Ellie Rasmussen peeked around, blinking behind her owlish glasses and smiling.

“Great new digs! You da man, Gan!”

“Hi, Ellie. Want to see my view of the parking lot?”

“My God, I’m afraid I’d get a nosebleed this high up.”

They kidded around until it was time for Gan to leave for a Century City press conference to announce Cornelius’ endorsement deal with Bigger Scott. Enright and the others had already left in a stretch limo. Gan was hitching a ride with Mary Ann Dugan.

“We’ve got a long way to go,” he said as she pulled out of the company garage.

“No, we don’t. We’ll be there in 15 minutes.”

“I mean the company, logistics-wise. Some of the honchos, Enright included, think this is the finish line—the Scott signing, the Corners alliance, all the neat stuff Brannan is doing for us. But it’s only a first step, or couple of steps. The ultimate objective is still to build our *own* logistics operations into a smooth-running, fully-linked supply chain and—”

“Uh-huh, makes sense.”

Mary Ann was nodding, Gan saw, but not really listening. Probably daydreaming about her enhanced customer service operation, just as he, given his own department to run, was lost in logistics reveries—information from the demand side fed through the Web back to vendors and manufacturing facilities to ensure smooth product distribution.

“Penny for *your* thoughts?” he asked his former supervisor.

“Two words,” she said. “Corn Pups.”

“What the heck are those?”

“Corn Dogs—for kids.”

“We don’t *make* Corn Dogs for kids.”

“But we could. With the way you’ve got product flowing, Gan, we can start seeking out other markets and experimenting with line extension. In fact, I’ve got a cross-functional team meeting with Marketing and Design tomorrow morning. See, logistics drives marketing too!”

Traffic slowed them down, but Mary Ann was still revving in high gear about her ideas as the valet opened their doors at the Century Plaza Hotel. As they speed-walked through the corridors toward the ballroom, Gan’s Palm Pilot started beeping.

“You go on in, Mary Ann, I’ll catch up.”

“Gan, no, it’s already started!”

“I’ll just be a second.”

It was a message from Brannan’s handheld supply chain visibility system—proof-of-delivery received mere minutes ago. The first air shipment of Corn Dogs had arrived at Corners’ West Coast hub DC! Gan gave a silent cheer, pocketed the handheld device and hustled after Mary Ann.

On the stage of the sectioned-off ballroom, Enright, prolonging his grip-and-grin with Bigger Scott for the cameras, was asked by a reporter how a company like Cornelius was able to respond so quickly with product to such an unexpected demand.

Enright pivoted from the microphone toward the Cornelius contingent in the wings. "I need McManus. Where is he?"

"He just walked in—way in the back."

Enright squinted, then swung back to the mike: "Good question. I suggest we ask the man who made it all happen, Gan McManus. Gan! Come on up here. These people have some questions for you."

Gan, hearing his name called out, froze. He wasn't scheduled to be part of this! But there was Enright beckoning from the lectern. Gan headed for the stage stairs, filled with apprehension and an overwhelming sense of déjà vu. Of course! It was just like the morning he'd been summoned to the sixth floor meeting without the faintest idea of why he was wanted. Here he was again, like an actor who'd lost his lines, trotting up the stairs, walking across the stage into the quartz-halogen glare of video lights. Enright pumped his hand, motioned out toward a sea of faces apparently waiting for his words.

What the heck, Gan told himself. Logisticians were supposed to be good at thinking on their feet.

He stepped up to the microphone.

THE END

Strikepoint was published 15 years ago.
Today's logistics challenges are quite different.
How would you now handle some of the challenges Gan faced? We'll publish some responses in an upcoming issue.
Email: editor@inboundlogistics.com

ABOUT THE AUTHOR

Born into a family of writers in New York City, Dan Pollock spent a dozen years as an editor with the *Los Angeles Times* Syndicate, leaving when his first thriller, *Lair of the Fox*, was published. Three more novels followed—*Duel of Assassins, Pursuit into Darkness* and *Precipice*, a "logistics thriller" commissioned by the Council of Logistics Management.

ACKNOWLEDGEMENTS

The following logisticians provided invaluable guidance and expertise: Rosemary Coates, Senior Director, Supply Chain Technologies, Answerthink; Joel Sutherland, Senior Vice President, Transplace.com; Robert L. Cook, Professor of Marketing and Logistics, Central Michigan University; and Frank Hathaway, past president of the Council of Logistics Management, Hathaway and Associates. The author also acknowledges a hefty debt of gratitude to the staff of Inbound Logistics for essential guidance in formulating the real problems and strategies that underpin the fictional events depicted in Strikepoint. — *Daniel Pollock*

INBOUND LOGISTICS

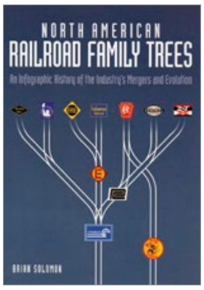
Winter READING GUIDE 2016

BY CHARLIE FIVEASH

Don't let winter put a deep freeze on your logistics learning. Keep your knowledge evergreen by cozying up to books on wide-ranging topics, from food logistics to procurement practices.

North American Railroad Family Trees: An Infographic History of the Industry's Mergers and Evolution

By Brian Solomon



Detailing a historical overview of the iconic American railroad system, this book provides insights into the families and businesses that built the U.S. rail network into what it is today. Filled with vintage photos, detailed maps, and historical accounts of the pioneers who were instrumental in the early development of rail lines across the continental landscape, this account is ideal for readers who follow American history, and are interested in how the infrastructure of North America's transportation systems developed.

Key Takeaways: Much has been written about the rise of the American railway system, but this overview gives readers a more in-depth look into the families who were instrumental in launching the U.S. rail network. While many families still operate the short lines that serve America's transportation infrastructure today, this account provides a historical overview of the lineage that makes up America's privately held rail systems.

The Everything Store: Jeff Bezos And the Age of Amazon

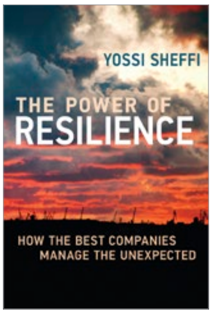
By Brad Stone

Stone tells the story of Amazon through the eyes of Jeff Bezos' friends and family, as well as former and current employees. Bezos' personal story alone is one worth sharing. This book focuses not only on Amazon's rise to super-retail prominence, but also on the company founder's renowned management style and personality.

Key Takeaways: With Amazon's prolific rise as a retail and supply chain leader, the story behind the company is not one to ignore. This book takes readers through Amazon's global prosperity and unprecedented growth in tandem with the interesting story of Jeff Bezos' management and leadership panache.

The Power of Resilience: How the Best Companies Manage the Unexpected

By Yossi Sheffi

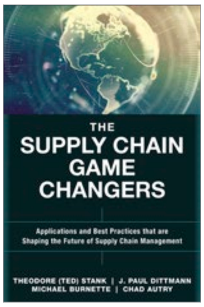


A well-known writer in supply chain circles, Sheffi provides real-world case studies of major economic and natural catastrophes that have impacted not just certain regions of the world, but the entire global supply chain. This book centers on how organizations combat the risk of disaster in major and minor proportions, providing practical advice and recommendations on how to prepare for risks in supply chain operations.

Key Takeaways: Many companies view risk management as another cost without measurable benefit, but Sheffi addresses how best-in-class organizations create agility and present a more responsive approach when managing both minor and major disruptions in operating platforms.

The Supply Chain Game Changers: Applications and Best Practices That are Shaping the Future of Supply Chain Management

By Ted Stank, et al



With a noticeable shift taking place in the logistics landscape, three University of Tennessee-based PhDs endorse the idea that the supply chain of 2025 will look remarkably different than today's operating platform. Drawing from best practices among leading-edge logistics-centric companies, the authors address 10 trends impacting the global supply chain, offering futuristic solutions to the complex challenges of today's supply operating systems.

Key Takeaways: Today's supply chains are more vulnerable than they were 10 years ago, so leaders in the logistics sector continue to assess trends and innovations tied to increased visibility, collaboration, agility, demand management, and process integration that will transpire over the next decade.

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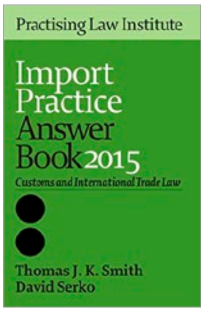
Import Practice Answer Book 2015

By Thomas J.K. Smith and David Serko

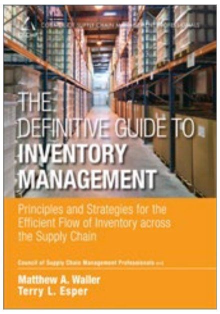


This comprehensive resource provides answers to every question a practitioner or student of importing needs to know. An excellent reference for customs compliance and international law, the book addresses important supply chain topics such as tariffs, duties, and surety bonds, and lays out the duties of customs brokers and international forwarders. The authors also address several different aspects of the import entry process.

Key Takeaways: Written by two attorneys, this book is a tremendous reference for anyone involved in importing as a principal or intermediary. Given its detail and legal angle, this guide serves as an excellent resource for those interested in pursuing the customs brokers' licensing exam.

The Definitive Guide to Inventory Management: Principles and Strategies for the Efficient Flow of Inventory Across the Supply Chain

By Matthew A. Waller and Terry L. Esper

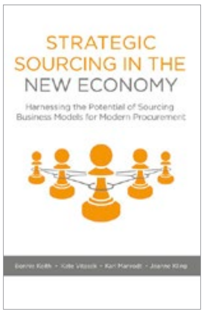


Written for inventory and procurement managers, this book addresses best practices and industry frameworks for optimal inventory management performance. The writing introduces basic terminology and key inventory management guidelines for newcomers and experienced practitioners alike. Written by inventory management experts in conjunction with the Council of Supply Chain Management Professionals, topics include using technology in inventory planning and management, and new approaches to inventory reduction.

Key Takeaways: This book captures all aspects of inventory management and optimization, and provides a technical overview of inventory control for advanced practitioners. Central to the book's theme is an emphasis on why inventory optimization is such an important metric for overall supply chain strategic solutions.

Strategic Sourcing in the New Economy: Harnessing the Potential of Sourcing Business Models for Modern Procurement

By Bonnie Keith, et al

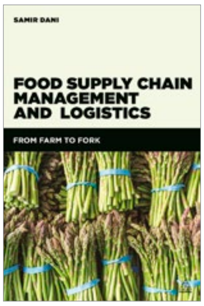


Drawing on in-depth academic research, four university professors with extensive procurement experience challenge the tried-and-true model of leverage in organizational procurement, and introduce a collaborative approach to outsourcing relationships. This book is written for sourcing and procurement professionals, but it also makes a good read for those interested in the new frontier of collaboration among global supply chain partners.

Key Takeaways: A new way of thinking about the procurement process – collaboration among suppliers and vendors – is transcending the supply chain. The purchasing and sourcing game is no longer about winning and losing, instead it centers on establishing long-term, collaborative relationships among buyers and suppliers.

Food Supply Chain Management and Logistics: From Farm to Fork

By Samir Dani

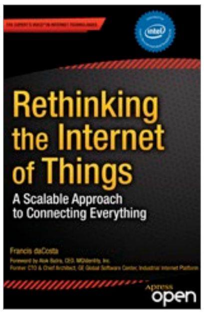


Dani's recently published book covers all aspects of the food value chain, starting with an overview of raw material suppliers and transcending to technology trends and innovation in food processing. The guide also addresses risks in the food supply chain, and various factors that affect international food logistics, substantiated by multiple case studies and industry examples. The author also explores food supply chain production and manufacturing, food regulation, safety and quality, food sourcing, food security, and future challenges.

Key Takeaways: Written for food logistics professionals, this educational book provides a comprehensive overview of all aspects of the food value chain.

Rethinking the Internet of Things: A Scalable Approach to Connecting Everything

By Francis daCosta

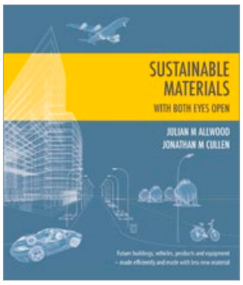


How will the Internet of Things (IoT) affect today's supply chain? Data flow between machines and devices will create efficiencies in supply chain operations, advancing beyond the era of radio frequency identification used in warehouse management. This guide discusses the impact of IoT on manufacturing, everyday activities, and the overall supply chain, while providing a look into the potential of machines interfacing with devices in the future.

Key Takeaways: When machines are able to communicate with other technology and devices in order to drive low-cost connectivity, then data interchange will accelerate productivity to control more than just a home thermostat or alarm system. With the dynamic growth of digital device exchange, daCosta predicts the number of smart devices will soon surpass the number of people on earth.

Sustainable Materials – With Both Eyes Open

By Julian M. Allwood and Jonathan M. Cullen

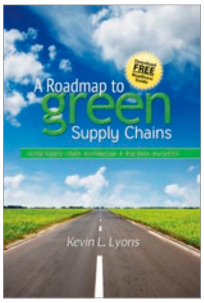


Recommended by Bill Gates, this book takes a research approach to implementing the five most important materials that make up today's supply source. Drawing from real-world commercial enterprises, the authors study the sustainable use of steel, aluminum, cement, plastic, and paper, and offer creative solutions for achieving manufacturing effectiveness.

Key Takeaways: By evaluating key processed materials in today's global supply chain, the authors explore the end-to-end integration of five major commodities in the manufacturing process, and evaluate the potential of using less physical material while advocating a recycling platform for each commodity group.

A Roadmap to Green Supply Chains: Using Supply Chain Archaeology and Big Data Analytics

By Kevin L. Lyons

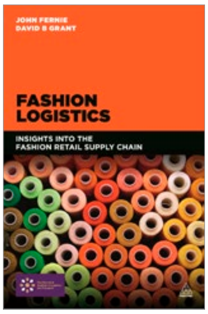


Lyons links the relationship between sustainability and supply chains, revealing how lean and green logistics can contribute to the planet's health and well being. Using modern day examples of companies that embrace a sustainable operating platform, the author gives practical advice for implementing a green approach across corporate and consumer supply chains.

Key Takeaways: Dispelling the concept that implementing sustainable practices will add to the cost of logistics applications, this book emphasizes that going green doesn't necessarily equate to spending more green. The book guides supply chain professionals through directing purchasing power to source products that fit their needs and are also sustainable.

Fashion Logistics: Insights Into the Fashion Retail Supply Chain

By John Fernie and David B. Grant

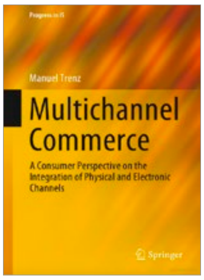


The authors address the latest supply chain trends impacting the fashion merchandising world. This book tackles all aspects of supply chain management in global fashion distribution, including sustainable and lean fashion merchandising, outsourcing, risks, omni-channel sales, and corporate social responsibility. Written in an easy-to-follow format, short case studies in each chapter relate the major topics in fashion logistics to modern-day retailing.

Key Takeaways: This book outlines the changes in the fashion retailing industry, and the implications they have on logistics. The authors also introduce the concept of "the last 50 yards", referring to the in-store consumer experience and customer service mandates in fashion retailing.

Multichannel Commerce: A Consumer Perspective on the Integration of Physical and Electronic Channels

By Manuel Trenz

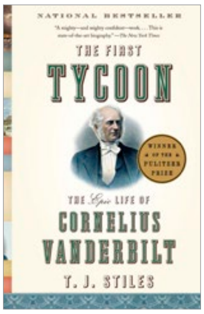


What impact will multi-channel sales have on a retailer's supply chain? This overview looks at the trending integration of online commerce versus traditional brick-and-mortar selling, and analyzes the consumers' perspective on multi-channel retail purchasing.

Key Takeaways: Taking a technical and research-oriented approach to analyzing paradigm shifts in retail distribution, Trenz introduces the multi-channel commerce continuum, which assesses online and offline sales from the purchaser's standpoint.

The First Tycoon: The Epic Life of Cornelius Vanderbilt

By T.J. Stiles

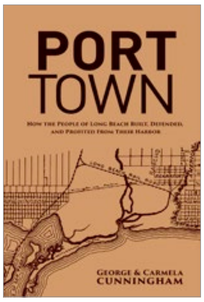


Written for historians and intermodal logisticians, this detailed account of Commodore Vanderbilt's personal and professional life provides a walk through a significant era in American history, detailing the genesis of the U.S. steamship and rail industries. With his background in maritime and railroad ventures, Vanderbilt may be the undeclared father of intermodal logistics. From his humble beginnings, and with a competitive nature, Vanderbilt built an industrial empire that continues to have a significant impact on today's logistics landscape.

Key Takeaways: Vanderbilt was one of the first pioneers of U.S. commerce. Starting as a ship fleet commodore at an early age, he ultimately built a naval empire that catapulted the United States into global maritime prominence. Complementing his shipping roots, Vanderbilt went on to develop an extensive railroad system in the United States, linking various short lines into an interconnected railway network across North America.

Port Town: How the People of Long Beach Built, Defended, and Profited From Their Harbor

By George and Carmela Cunningham

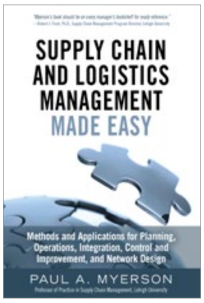


This short read details the growth of the Port of Long Beach from a marshy mud-flat to an economic powerhouse. The book provides not only an overview of the Port of Long Beach's history, but also a look inside the entrepreneurial spirit of those who were instrumental in the port's development and ultimate ascension to maritime prominence.

Key Takeaways: Providing an in-depth historical perspective of the port's development, the authors highlight stories of winners and losers in the land acquisition game, and provide an inside look at the political maneuvers that eventually led to the development of North America's largest seaport.

Logistics and Supply Chain Management Made Easy: Methods and Applications for Planning, Operations, Integration, Control and Improvement, and Network Design

By Paul A. Myerson



This recently published book will interest teaching professionals and students who study all facets of logistics and supply chain management. Myerson uses charts and detailed definitions to break down industry basics in a user-friendly, yet academic approach. The book covers the evolution of supply chain management, procurement, inventory/order management, transportation, materials handling/packaging, and reverse logistics. Key topics include supply chain sustainability and Lean management techniques.

Key Takeaways: Myerson covers every aspect of the logistics ecosystem, addressing key terms and trends. He focuses on both the basics of the industry and the complex issues facing logistics professionals.

Casebook | by Tom Gresham

Lean Management: Ready, Set, Grow

Apex International reaches the height of success by cutting waste and going Lean.

Dave Goldberg, CEO of Apex International, decided his company needed a dramatic change to regain its footing. For more than one decade, Apex, a contract manufacturer based in Chaska, Minn., had enjoyed consistent and headlong growth, expanding at a compound annual rate of approximately 35 percent during its first 12 years. Times were so rosy that Apex's momentum proved immune to even the most hostile economic conditions. In fact, during one year at the height of the recession, Apex managed to boost its profits more than 40 percent.

Goldberg, a former customer of contract manufacturers, started Apex in 1999. Apex develops, produces, and distributes products such as sunscreen, bath and body care, and child care items for over-the-counter, cosmetic, and household realms. The company maintains a combined 120,000 square feet of manufacturing space between two production facilities, and 300,000 square feet of laboratory, warehouse, and distribution space.

The sustained prosperity Apex experienced for more than one decade had hard work and personal sacrifice at its roots, Goldberg says. However, the company became too big for the processes and structure it had maintained through its boom years. For Apex to continue to be successful at its larger size, it would need to be more efficient and focused, reducing waste in every component of the business—especially in the time it took to complete tasks.

Processes Hinder Success

"Our success didn't come through process," Goldberg says. "It was many acts of heroism, and it got to the point where we couldn't continue to have that kind of success the way we were doing things."

Launched in 1999, contract manufacturer Apex International moved to its current headquarters in Chaska, Minn., in 2001.

Apex observed the success other companies—most prominently, Toyota and Danaher—experienced when adopting Lean management principles and philosophy, and decided that held the best prospects for the company's future. Apex pursued efficiency to ensure that speed, productivity, and quality became steadfast strengths.

A Simpler Solution

Initially, Apex attempted to implement Lean management principles and tools on its own, but was not successful. The leadership team decided the company needed outside help.

Apex researched and spoke with firms that could aid its adoption of Lean, and gravitated toward Ann Arbor, Mich.-based Simpler Consulting, a Truven Health Analytics-owned company that serves as a coach and consultant for organizations adopting Lean enterprise solutions. Manufacturing is one of Simpler's chief client areas, and many of its consultants have manufacturing industry backgrounds, according to Mike Chamberlain, president of Simpler Consulting North America.

Most of the firms Apex encountered touted their capabilities in teaching clients an assortment of Lean tools. Their focus was tactical. Apex, however, sought a more strategic, wholesale approach. "Simpler was not just about implementing Lean, but about enabling a cultural shift so we could go through a transformation to change how we operate," Goldberg says.

Simpler appreciated Apex's perspective from the outset. "Its initial premise was to improve, and to become a more customer-centric organization," Chamberlain says. "That's exactly the mindset we can stand behind."

Simpler began to work with Apex in June 2014. First, the companies partnered to develop a transformational plan of care, which served to identify why Apex was taking this major step, what it hoped to accomplish, and what metrics would determine if the effort was successful. Then, they burrowed down to Apex's value streams, mapping the paths that materials and information travel on every project within the company.

From there, Apex defined its current state in each value stream, identified the steps it would take to improve in those areas, and sought to develop and schedule rapid improvement events to aggressively pursue and complete specific objectives, each within a window of 60 to 90 days.

Goldberg describes the process as daunting. "It's a big change," he says. "Our employees were used to doing things the way they've always done them. They were apprehensive, but up for the challenge."

Weeding Out Waste

Apex soon learned its operation was needlessly complex. A siloed organizational structure created redundancies in processes, including many information and materials handoffs from one person to another. "There was a tremendous amount of waste in the process," Goldberg says.

In response, Apex worked with Simpler to develop flow cells that simplified the workflow across the company, and addressed daily tasks such as taking orders; receiving and testing materials; and making, filling, testing, and shipping products. The new flow cells shaved handoffs to approximately 25 percent of what they had been in the silo-style arrangement.

Commitment from the Top Down

Apex wanted to ensure a full commitment to Lean, and that meant dedicating resources to it. This included developing a team that was charged with overseeing Lean projects, while providing support, teaching, and coaching. Weekly meetings tracked progress and kept an eye on Apex's "true north" metrics—Simpler's term for key measurements that indicated Lean's impact on the company.

The Apex leadership team makes it a point to be conspicuously involved in the process. For instance, each member of the team regularly walks to different areas of the company to check on headway and offer assistance. This visibility helps deliver the message of Lean's importance to the company.

Lean principles, in fact, depend on changes being both identified and implemented through the efforts of workers at

Apex has worked to increase efficiency on the manufacturing floor, and reduce wait times for its customers. Lean management has cut delivery times by 50 percent.

By adopting Lean management principles, Apex reduced the number of employees who handle materials in a typical workflow, cutting the time it takes to prepare them.

every level of an organization. "Senior leadership defines the what, and employees define the how," Chamberlain says. "You have to engage middle management and the people on the front lines. If you give them a prescriptive cookie-cutter approach to what their jobs should look like, Lean management will fail in record time."

Goldberg has been pleased with the way employees have embraced the project. Approximately 50 percent of Apex's 400 employees have been involved in at least one rapid improvement event, and Goldberg says enthusiasm generally runs high.

"Everyone is getting exposed to Lean," he says. "They're learning the process and taking it back to their areas. It has become a grassroots movement."

Apex finds its most robust signs of progress come with the quality and commercialization teams. Change has been more challenging on the manufacturing floor because it is home to the most processes and the most people.

A Constant Challenge

Wary of backsliding, Goldberg has been pleased to observe Lean increasingly integrated into daily operations, but he recognizes potential pitfalls ahead if discipline slackens. "A commitment to Lean is constant," he says. "You can never let up."

Apex was fortunate not to lose customers during the painful stretch when processes faltered and created problems. The company made a point of reaching out to those clients as it has embraced Lean to explain the new process and its benefits.

In response, existing customers are submitting more orders, and new customers are arriving. After years of essentially flat growth, Apex has begun to return to the expansion of its earlier years. In the fourth quarter of 2015, customer orders were up more than 40 percent—and Apex has the processes in place to fill them on time.

Lean management has found a home at Apex, and Goldberg is excited at the possibilities forming for the future. Already, talented workers no longer needed in their old posts because of improved efficiency have been reassigned to places in the company where they can add more value. In addition, Apex's swifter deliveries have helped reduce inventory by 60 percent, opening up square footage to accommodate growth and improve the company's cash position. More possibilities will emerge as Apex infuses Lean more thoroughly, Goldberg says.

"Once we get to the point where everybody's on the same page and working toward the same objectives, Lean management will become extremely powerful and be difficult to compete with," he says.

Once faced with a worrisome future, Goldberg and his leadership team elected to adopt the Lean management philosophy to jolt the company, and improve efficiency and effectiveness. With the help of Simpler Consulting, Apex embarked on a transformation of both its processes and its culture to jumpstart the company and return it to profitability. ■

LEANING TOWARD IMPROVEMENT

Since contract manufacturer Apex International implemented Lean management techniques and principles, the results have been striking:

- Delivery time improved by 50 percent.
- Productivity increased by 30 percent.
- First-time right orders hit 99.8 percent.
- Quality errors reduced by 50 percent.
- Documentation errors decreased by 80 percent.
- Excess fill reduced by 75 percent.
- Changeover duration reduced by 90 percent.

The company also reduced waste due to increased real-time recording and visual management, and achieved quicker throughput from the arrival of raw materials through release of product.

IT Toolkit

by Jennifer Baljko

WMS Gives the Gift of Visibility

SendOutCards, an online greeting card and gift provider, started out the same way many companies do—in the garage of its founder. In 2005, Kody Bateman, founder and chief executive officer, launched a grassroots effort to help local businesses find creative and personal ways to thank their clients and mark special occasions.

Greeting cards are read. Gifts say, "Thank you." SendOutCards' WMS boosts visibility and optimizes fulfillment, too.

Its card business expanded, and customers began asking if they could add "a little something extra" along with their cards. In 2007, the Salt Lake City-based company responded by offering gift cards and, soon after, added small packets of brownies, chocolates, and cookies. The company started with five product SKUs, and today offers more than 1,650 SKUs on its gift list.

To date, SendOutCards has delivered 100 million cards and three million gifts worldwide. Each day, the company ships an average of 60,000 cards, and anywhere from 1,500 to 3,500 gifts. Nearly 70 percent of the company's card orders are business-to-business transactions, and gifts, costing between $5 and $150, are included with about five percent of total card orders, says Jerame Schultz, SendOutCards' vice president of operations.

The company also claims to be one of the fastest growing network marketing companies in the world with approximately 60,000 distributors—individual business owners who use SendOutCards' platform as a personal financial vehicle to help other people follow through on card and gift prompts marking birthdays, anniversaries, or other life events.

"Originally, we were focused on the personal touch," says Schultz. "SendOutCards is not a site where people order something for themselves. It's where someone makes a heartfelt card for someone else, and attaches a small gift.

"It also is a relationship-building tool for businesses, and a way for businesses to follow up with their clients," he adds.

On average, SendOutCards ships 60,000 cards daily, with a majority of card orders—nearly 70 percent—business-to-business transactions.

For many years, SendOutCards handled the volume and growth influx manually, and based its workflow mostly on paper-centric fulfillment processes.

Customers picked and customized cards from SendOutCards' catalog, and could choose fonts or personalized handwritten signatures. Workers would access the database as orders came in, print the cards one at a time, and cut them to size. Gift additions were noted on the back of the card, and workers collected items off the shelf. Cards and gifts were then stuffed into envelopes and shipped off.

Multi Gifts, Multi Challenges

Rapid growth came with a price, however. SendOutCards discovered its limits around 2013. To capitalize on its booming business-to-business segment, the company augmented its service with a multiple gift-giving option. Doing so also immediately increased supply chain complexity, and strained the existing order fulfillment processes.

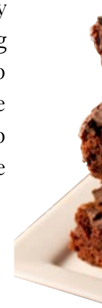
"When we launched the multiple-gift service, we started to see the negative impact on quality control and accuracy," says Schultz. "It became logistically challenging to match card and gift orders."

Although the company had supplemented its maturing card business with printers able to produce hundreds of cards faster, the multi-gift option opened the door to greater customer personalization, and that, in turn, required more careful fulfillment practices and greater flexibility.

Under the single-gift system, for instance, a SendOutCards customer could run a business campaign with 100 thank-you cards, and add a two-brownie packet to each card as a gift; users could change the name of the end customer receiving the card to make the greeting personal, but everyone would receive the same gift.

The multi-gift system changed these dynamics. With the multi-gift option, SendOutCards users could now add a second gift to some orders, or swap out the chosen gift for another one. For example, customers running a 100-card campaign could add a second additional gift, say, a token along with the originally ordered brownies for special clients, or send cookies instead of brownies to other clients.

The idea of a third-party technology solution won favor as the company stretched its manual, paper-based fulfillment practices, and struggled to accurately match card and gift orders. SendOutCards needed to expand its operational capacity in a more automated way while keeping the personal touch customers had come to appreciate and continuing to grow its core business services. Real-time visibility into its end-to-end order fulfillment process rose to the top of the priority list.



Birthday Card Changes Everything

The same year SendOutCards dove into multi-gift orders, Kirk Anderson received a birthday gift from his mother. The card featured a picture of Anderson, and his mother thought her son might enjoy a few brownies, so she included a small gift package as well. Anderson's mother ordered the card and gift from SendOutCards.

"I remember getting that card and thinking, 'Wow. They had to personalize the card, and then attach these brownies, which are perishable, to the order," recalls Anderson, vice president of channel sales for Snapfulfil. "I wondered how they did that, and what fulfillment processes they used. Maybe they could use something like Snapfulfil."

Snapfulfil is a cloud-based, Software-as-a-Service (SaaS) warehouse management system (WMS) developed by Synergy Logistics Ltd., headquartered in Loughborough, United Kingdom, and with U.S. offices in Charleston, S.C., and Chicago.

Following a hunch in early 2014, Anderson searched for SendOutCards executive profiles on LinkedIn, and cold-called company leaders to build connections and understand its business model. After several conversations with senior-level decision-makers, Anderson learned that SendOutCards was growing rapidly, and was getting to a point where a WMS solution soon would be a to-do priority. But SendOutCards wasn't quite ready when Anderson called.

Anderson kept SendOutCards on his call list, and SendOutCards kept Snapfulfil in mind as executives assessed IT needs and looked for cost-effective ways to improve order fulfillment efficiency and visibility.

SendOutCards greenlighted the Snapfulfil implementation in the fall of 2014, and the rollout started in early 2015, says Anderson. SendOutCards set a soft go-live date for spring 2015, building in enough time for possible delays coinciding with busy holiday peaks, such as Valentine's Day and Easter, when card and gift orders increase and staff energy is redirected.

Snapfulfil became SendOutCard's order fulfillment engine by summer 2015.

"We saw this as an opportunity to pinpoint areas where we could do better," says Schultz. Sometimes, SendOutCards targeted specific practices to manage and improve, while other times the WMS identified unknown shortfalls, including the ability to track damaged goods or report employee purchases.

Jumping Into Real Time

Snapfulfil's WMS suite had several features SendOutCards found appealing. Among them were real-time visibility of both inventory and orders, optimization of the putaway and picking process, and a pre-shipping verification scan that improves overall order fulfillment accuracy.

Snapfulfil, running off a Web API, also interfaces with SendOutCards' ERP and accounting systems, which allows other business functions to access dynamic inventory stock, order status, and order position information, adds Anderson.

One outcome was an improvement in filling orders. Previously, about 15 to 20 people fulfilled far fewer orders. With Snapfulfil, 12 people can now fill even more orders with fewer errors because of the improved end-to-end order and inventory management capabilities, says Schultz, adding that the company's order fill rate improved by 43 percent and duplicate shipments have been eliminated (*see sidebar*).

This workflow improvement comes in handy during SendOutCards' busiest season, which is typically November and December. The company easily handled a peak day of 5,212 holiday gift orders during the 2015 Christmas season, and is looking forward to breaking the 10,000-order mark.

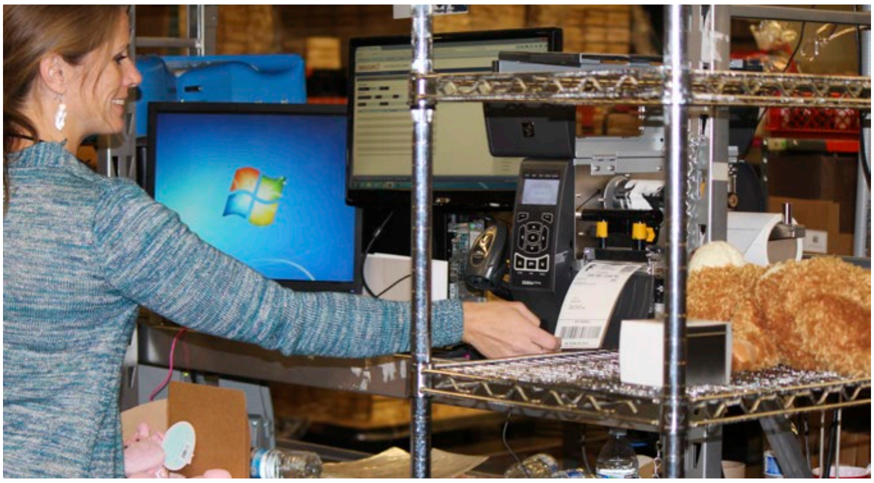
Inventory management has also gotten easier, particularly when it comes to tracking perishable items such as brownies, SendOutCards' top-selling gift. With Snapfulfil, the company now completes month-end inventory counts in half the time, and is able to track an item's full movement from the time SendOutCards places an order with its suppliers to delivery to the end recipient.

"We source lots of fresh, locally made gourmet food, and receive one or two pallets of brownies every day," Schultz adds. "The way we managed this before was the old 'stick your thumb out in the breeze' trick. We based orders on sales projections, but we didn't really know how much inventory we needed or had.

"Snapfulfil helped us with that," he adds. "It showed us where we were getting in trouble, and when we didn't need as much inventory."

An unexpected side benefit was freed-up real estate on the back of the printed card, where SendOutCards previously listed gifts attached to the order. Now, a 2D barcode that works like a QR code contains the total order information and can be easily accessed with a scanner. Because the barcode is placed on one corner of the card, the middle section is available for customers to add logos or other branding material, customization options not previously available.

"We're still working through some things and areas we can improve on," concludes Schultz. "But Snapfulfil has helped different functions within the company to communicate with one another, and has given us a better picture of what is happening with our orders. It has created transparency throughout our operation." ■



With Snapfulfil's end-to-end order and inventory management capabilities, fewer staff members can fill a greater volume of orders with increased accuracy.

WINNING THE CARD GAME

Snapfulfil's WMS allowed SendOutCards to:

- Eliminate duplicate shipments
- Improve order fill rate by 43 percent
- Do month-end inventory counts in half the time, with complete accuracy
- Track an item's full movement from supplier order to end recipient delivery

DC Solutions

by Sandra Beckwith

Coming in Out of the Cold

Order pickers warm to a cold chain warehouse redesign that heats up efficiency by 45 percent.

It's one thing to operate a cold chain warehouse that's inefficient, but when growth raises safety concerns as well, then it's time to make changes. That was the situation Life Technologies Corporation's distribution center in Fredericksburg, Md., faced in 2012 before Thermo Fisher Scientific Inc. acquired it in early 2014. Today, as part of Thermo Fisher's Life Science Solutions business, the brand provides temperature-regulated bioproducts to research laboratories nationwide.

Sharing aisles with pushcarts, forklift trucks, and ladders, about 35 pickers filled orders for products stored in the warehouse's refrigerator and freezer sections. It was a busy, labor-intensive environment until out-of-the-box thinking – literally – during a facility redesign brought in Werres Corporation, a local materials handling integrator and distributor, to implement a gravity-fed racking system installed behind deli doors.

What was then Life Technologies was formed as the result of a merger between Bethesda Research Laboratories and Grand Island Biological Company, which was founded in 1962 to make serum harvested from horses raised on company land. After a series of acquisitions, the company is now a product brand of Thermo Fisher Scientific of Waltham, Mass. The Grand Island site in western New York still maintains a small cold chain warehouse, while a third facility operates in Carlsbad, Calif.

As part of Thermo Fisher's Life Science Solutions business, the brand provides products – ranging from antibodies to cloning kits – used in cancer and stem cell research, drug discovery and development, and synthetic biology. Because most are temperature sensitive, proper cold chain management is required as the products move through the supply chain. Adverse conditions during storage and transport could compromise quality and cost money.

Pickers in Thermo Fisher Scientific's cold chain warehouse in Fredericksburg, Md., now fill orders in ambient temperature spaces. Deli-door style cases housing refrigerated products are on the first level; similar freezer cases are accessed via a second-level mezzanine.

In 2012, the company divided its Fredericksburg cold chain warehouse into a 13,000-square-foot +4-degree cold box and a 9,000-square-foot -20-degree freezer. Each unit had wide aisles between pallet racks of products. Pickers wearing cold suits and gloves filled 3,400 orders daily. With pallets containing from three to 10 boxes with different SKUs, it took the pickers some time to find the right products for each order.

"As our order volume grew, and more people and equipment moved through each unit, we became concerned about safety," says Thomas Brown, the systems engineer who spearheaded the improvements.

Packing Heat

Anticipating the Thermo Fisher acquisition and resulting growth, Brown worked with the distribution management team to find the best solution for a warehouse redesign that incorporated the packing area as well. Team members examined different layouts and configurations before selecting an option that increased efficiency while reducing the number of pickers needed.

With his more than 35 years of experience in the field, Brown knew which vendors could provide the needed services. After considering several proposals, he selected Werres, a UNEX Manufacturing Inc. distributor that had been providing products and services to the facility for years. UNEX, a Lakewood Township, N.J., company, develops order picking and pallet rack carton flow solutions for industrial applications.

"We were also looking for a turnkey solution that included truck conveyors and racking, and we especially wanted to work with a local business," Brown recalls.

Thermo Fisher and Werres jointly implemented the solution, which relocated the packing space while moving pickers out of the cold storage unit and into the ambient temperature environment in front of two levels of 94 deli doors. The first level stores refrigerated products on gravity-fed racks behind glass deli doors, similar to those used in supermarkets. A new second-level mezzanine, built directly above the cold box picking area, provides access to a similar setup for freezer cases. Pickers climb stairs to reach the second level.

The biggest challenge was doing the installation while Thermo Fisher continued to fill orders daily.

"It was a logistically challenging project for all of us," notes Bill Costa, vice president of sales for Werres. "For example, the adjoining space that would be reconfigured for the new packing area had to be ready before we could install the packing conveyors for that area. Once we had them in place, and packers moved into that space, we could demolish the original packing area." That space is now used for ambient pallet rack storage.

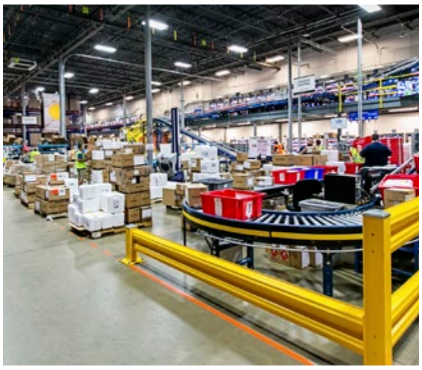
After demolition was done and packing re-located, it was time to build the mezzanine, install conveyors, and add racking to the coolers and freezers while warehouse staff moved product behind false walls in the warehouse to accommodate construction.

Two Werres teams managed the new deli-door systems project while a third group created and installed a new conveyor solution that connected all locations – cold boxes on the floor level, freezer boxes on the upper level, and the new packing area adjoining the bi-level picking area. Conveyor installers often worked in the middle of the night so they wouldn't interfere with business during the day.

"The implementation schedule looked like a 10,000-piece jigsaw puzzle," Costa says.

Once Thermo Fisher cut doors through the wall dividing the cooler and freezer warehouses from the ambient temperature space, Werres built the mezzanine for the upper-level freezer. Next came the installation of UNEX pallet racking and shelving, with UNEX Span-Track Bed gravity flow racking behind the deli doors.

Today, pickers working in the ambient space pull products from the first-level cold box door and rack solution that measures 150 feet long by 25 feet high; the corresponding freezer unit is 100 feet by 25 feet. Werres installed 1,600 linear feet of UNEX Span-Track wheel bed that allows products to roll forward when the front product has been pulled out in a gravity-fed system. The



An expanded packing area was a key improvement in Thermo Fisher Scientific's cold chain warehouse redesign.

typical cold case is configured with up to six levels of shelves installed at varying heights to accommodate a range of storage bin sizes.

Racks hold blue bins of different sizes that, in turn, store products with varying shapes and dimensions; product package sizes range from one-inch-high vials to 10-milliliter bottles to large boxes. Each bin can be sub-divided so it contains a range of sizes. This allows bins to hold several SKUs if necessary, and gives the company more pick faces behind each deli door. Because the system also allows racks to store any configuration of bin sizes, products can be shelved as needed to meet demand. Each case can hold 20 to 30 bins of SKUs.

A new spiral conveyor moves order picking bins from the first floor, where pickers place products from the cooler in color-coded order totes, to the mezzanine level above, where other pickers add frozen products to the totes. Totes with completed orders move by conveyor back down to the packing area on the ground level.

Pickers can fill about 65 percent of orders through the new deli-door system. They still do case or pallet bulk picking inside the cold units, which were reconfigured to create more storage capacity. With fewer people using less equipment, aisles could be narrower and fitted for wire-guided forklift trucks. Deli-door racks are replenished from the warehouse side, with workers using forklift trucks to load second-level freezer cases.

"It's the first time we've done this setup in a wholesale environment, with operators picking outside of the freezer," says Brian Neuwirth, vice president of sales and marketing for UNEX.

Picking Up the Benefits

It is an unusual solution, but the payoff is clear: Thermo Fisher's Fredericksburg distribution center reduced the number of pickers from 35 to eight, while increasing pick efficiency by 45 percent. Pickers were reassigned as forklift operators or transferred to packing stations. And, improved packing space design and more packers allowed the company to eliminate a third packing shift. The facility has since increased daily order fulfillment from 3,400 to a range of 3,600 to 3,800 orders, while continuing to work toward a zero-percent picking mistake rate.

The company also nets additional savings because fewer people move throughout the cooler and freezer. The more people, the warmer the space and the harder condensers are forced to work to maintain the correct temperature.

"We put more products into a smaller footprint that requires fewer pickers, and that's significant," Costa says.

All changes at the Fredericksburg facility were executed without impacting daily operations or forcing a product shift to other warehouses. "It took detailed planning and organization," says Brown. "But we didn't miss a single order." ■

White Paper Digest

Industry experts amass supply chain management best practices and skill sets, and invest in new research and evaluation tools. Now you can benefit. *Inbound Logistics* has selected this collection of whitepapers that will give you a jump on important supply chain issues. For more information on any of these whitepapers, visit the Web sites listed below.

C3Solutions

TITLE: ***Common Myths About Dock Scheduling***
DOWNLOAD: *bit.ly/1h2T1mW*
SUMMARY: Myths are a neverending story, but your scheduling challenges shouldn't be. Company visionaries – be they CEOs, warehouse supervisors, IT project managers, or continuous improvement team leaders – often face the challenge of breaking down myths. The articles included in this whitepaper have been assembled to help these leaders break down the myths related to dock scheduling.

Verizon

TITLE: ***How to Get More Done for Less With a GPS Fleet Tracking System***
DOWNLOAD: *bit.ly/1WMQ5tM*
SUMMARY: Controlling labor costs doesn't have to lead to diminished service quality. In fact, with a vehicle tracking solution like Networkfleet, you can control labor costs and improve service quality at the same time by managing your entire fleet more efficiently and effectively. Combining the data from Networkfleet with a disciplined approach that rewards drivers for efficient driving habits can enable your fleet to drive fewer miles, reduce overtime and other labor expenses, and get more jobs done in less time. To learn more about how a vehicle tracking solution can help bring your labor costs under control, download this free whitepaper today.

Envista

TITLE: ***Find the Money: How a Transportation Spend Diagram Can Help***
DOWNLOAD: *bit.ly/1NqBYIP*
SUMMARY: Transportation leaders look for ways to reduce costs while improving service levels as they conduct strategic assessments or solution designs. In this whitepaper, you'll learn how developing a simple, one-page transportation spend diagram at the beginning of your strategic assessment will identify savings opportunities throughout your transportation operations.

Evans Distribution

TITLE: ***The E-Commerce Impact on Logistics: Why You Need a 3PL That Can Support Your Omni-Channel Strategy***

DOWNLOAD: *bit.ly/1LELwtD*

SUMMARY: The time of elaborate, multi-story shopping centers is rapidly changing with the rise of e-commerce and omni-channel shopping. Over the past decade, technology has inspired an online retail boom that has benefitted some retailers. With the younger generations embracing smartphones and tablets, e-commerce's role has shifted from an untested frontier to a vital pillar of the retail industry.

Kane Is Able

TITLE: ***How Lean is Lean?***

DOWNLOAD: *hubs.ly/H01md5l0*

SUMMARY: Lean quality improvement programs have driven billions of dollars' worth of value across corporate supply chains. But, if you're not careful, these programs can become weighed down with bureaucracy, adding time and cost to your quality improvement efforts. This eBook reviews practical ways to make sure Lean program management doesn't get in the way of getting the work done.

Weber Logistics

TITLE: ***Reduce Freight Transportation Costs with Intermodal Service***

DOWNLOAD: *bit.ly/1NyRWhP*

SUMMARY: Over-the-road trucking has had its challenges in recent years, thanks to driver shortages, HOS regulations, rising fuel costs, and capacity shortages. During that time, railroads have been improving tracks and facilities, as well as service offerings, to meet shippers' needs. This paper addresses the misperceptions of intermodal service, and provides tips to get the most out of intermodal service.

C.H. Robinson

TITLE: ***Wide Open: How the Panama Canal Expansion Is Redrawing the Logistics Map***

DOWNLOAD: *bit.ly/1Up7E1w*

SUMMARY: How will the Panama Canal expansion in 2016 impact logistics? You'll find the answers in this new whitepaper, published by C.H. Robinson in collaboration with Boston Consulting Group. Among the paper's conclusions: The expansion could shift 10 percent of container traffic between East Asia and the United States from West Coast ports to East Coast ports; the battleground on which U.S. ports compete for customers will move several hundred miles west, to a region that accounts for more than 15 percent of GDP; and shippers and carriers will have to adapt their strategies and operations as logistics grow more complex.

WhitePaperDigest

J.B. Hunt

TITLE: ***Dwell: How Intermodal Terminal Congestion Impacts Capacity and Service***

DOWNLOAD: *http://jb.ht/WhitePaperDwell*

SUMMARY: The railroad industry is experiencing a congestion issue called "dwell" that, when combined with recent and forecast increases in rail volume, impacts capacity, service, and growth. Dwell is the period of time starting when a container is unloaded from the train and ending when the container has departed from the rail facility. This whitepaper examines the problem with dwell, and offers solutions.

IDV Solutions

TITLE: ***8 Principles of Supply Chain Risk Management***

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SUMMARY: It is impossible to completely eliminate risk from your supply chain, but you can minimize exposure to risk with careful planning, tools, and processes to anticipate and manage risk more effectively. This free whitepaper is an accumulation of experiences documented to help guide companies as they mature their supply chain risk management program and make changes to proactively respond to and minimize the impact of risk events. Download this whitepaper to gain new insights into supply chain risk management.

Savi and IDC Research

TITLE: ***IoT-Enabled Analytic Applications Revolutionize Supply Chain Planning and Execution***

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SUMMARY: The Internet of Things (IoT) will "deliver on the promise of true end-to-end supply chain visibility for the first time," reports IDC in this new whitepaper. Want to know how? Download this free resource to learn why milestone-based visibility solutions are no longer acceptable in today's competitive marketplace; how the IoT will impact supply chains with new solutions that provide unprecedented visibility; and why businesses should focus purchasing on "purpose-built applications" rather than toolkits.

BellHawk

TITLE: ***Using Technology to Enable Rapid Growth of Make-to-Order Manufacturing Businesses***

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SUMMARY: This whitepaper addresses the specific challenges faced by manufacturers that provide custom and semi-custom products to customer order. It presents an easy-to-understand example of a solution developed for a custom chair manufacturer, and discusses how real-time work-in-process and inventory tracking systems use technologies such as mobile computing, barcode and RFID data collection, cloud computing, and real-time artificial intelligence to improve process efficiency and boost productivity to achieve greater sales.

PeopleNet

TITLE: ***Considerations for Complying With the ELD Mandate***
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SUMMARY: Learn how to get the most return on investment from your fleet while also abiding by the Federal Motor Carrier Safety Administration's new mandate requiring the use of Electronic Logging Devices (ELDs) to log drivers' record of duty status. This whitepaper explores what the mandate entails, and the features and functions of ELDs. It also includes advice on how to successfully implement these devices into your existing systems.

Relayware

TITLE: ***A Quick Guide to High-Performing Partner Portals***
DOWNLOAD: *bit.ly/1Up7BTr*
SUMMARY: Are your supply chain partners passionate about your partner portal? It's essential that they are if you want to generate loyalty and increase sales. Your portal is the go-to source for most of your channel partner contact and information, so it needs to provide first-class support, tailoring partner experience to need, avoiding confusion, and eliminating frustration. Download this quick guide, which provides best practices for building a successful partner portal.

BestTransport

TITLE: ***TMS and the Reverse Supply Chain***
DOWNLOAD: *bit.ly/1Up7C9T*
SUMMARY: Getting control over outbound freight is a top priority in today's supply chain. But many organizations fail to look at their inbound freight with equal scrutiny. Be it backhaul, customer returns, repairs, inventory replenishment, or incoming raw materials, using a TMS for your reverse supply chain presents huge opportunities for savings and optimization. Download this free whitepaper and learn about getting more control over your reverse supply chain.

3PL Central

TITLE: ***The Five Point Tune-Up For Your Warehouse***
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SUMMARY: Is your warehouse 100-percent ready to seize all the opportunities 2016 has to offer? To help make sure you are, download this free whitepaper. Written by warehouse professionals, this publication will provide you with a step-by-step guide to improving your efficiency, assessing your current assets, and increasing your overall profitability.

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- In-House Custom Services
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- Pick & Pack and Ticketing
- Piggyback Drayage
- Protective Services
- Specialized Equipment
- Specialized Material Handling
- Tailored Distribution Programs
- Warehousing

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Retail Supply Chain Conference 2016

Retail Industry Leaders Association (RILA)
bit.ly/RILAconference

The conference explores the changing nature of retail, and supply chain's critical role in serving the customer. With seismic shifts in technology, consumer preferences, delivery expectations, and shopper engagement, discussion topics center on how supply chains can respond today's omni-channel world.

MAR 13-15, 2016
Orlando, Fla.
2016 IWLA Convention & Expo

International Warehouse Logistics Association (IWLA)
bit.ly/IWLAconvention

Celebrating the 125th anniversary of IWLA's founding, the 2016 IWLA Convention & Expo highlights warehousing innovation, and features educational sessions on warehouse logistics. The event includes a 3PL-focused trade show, general sessions, IWLA council and chapter meetings, receptions, and the anniversary grand finale.

MAR 30-31, 2016
Atlanta, Ga.
Home Delivery World 2016

Terrapinn
www.terrapinn.com/homedelivery

The event brings together retailers, etailers, grocers, and solutions providers to explore strategies to optimize product fulfillment, delivery, and customer satisfaction through supply chain, logistics, warehousing, and transportation operations. Trends in delivery operations add to the discussion.

APR 4-7, 2016
Atlanta, Ga.
MODEX 2016

MHI
www.modexshow.com

Industry experts gather to network and share their perspectives on the ever-evolving state of the supply chain—the latest innovations and cutting-edge ideas. MODEX attendees attend hands-on demonstrations of the latest manufacturing and supply chain equipment and technologies from more than 800 providers. Through exhibits, educational sessions and events, and keynotes, participants learn how to solve manufacturing and supply chain challenges, identify best practices, exceed customer demands, and gain a competitive edge.

APR 11-13, 2016
Phoenix, Ariz.
ECA 2016 Shipper/Carrier MarketPlace

Express Carriers Association (ECA)
bit.ly/ECAmarketplace

At this event, shippers and carriers collaborate and provide information and referrals to form logistics partnerships. Shippers find regional and specialized carriers that can provide a viable supply chain alternative. The exhibition showcases new technologies and various transportation services.

APR 12-14, 2016
Winston-Salem, N.C.
Inmar Analytics Forum
Inmar
inmarforum.com

The forum brings together business professionals from the supply chain, promotion, and healthcare industries to explore how data and analytics can be employed to improve conversion, operational efficiencies, and business and patient outcomes. Thought leaders conduct an interactive information exchange analyzing real solutions to today's challenges.

APR 19-20, 2016
Atlanta, Ga.
Georgia Logistics Summit
Center of Innovation for Logistics
bit.ly/GAlogistics

Industry executives share first-hand supply chain insights, discussing opportunities, challenges, and what they look for from logistics partners. Expanded sessions explore Georgia's logistics technology, what's new and next around the state, a look at current logistics regulations, and a transportation update.

APR 24-27, 2016
Orlando, Fla.
NASSTRAC Shippers Conference & Transportation Expo
National Shippers Strategic Transportation Council (NASSTRAC)
bit.ly/shippersexpo

NASSTRAC's collaborative labs allow participants to learn best practices and share practical ideas and common challenges, covering topics such as changing the perception of logistics and how to conduct and evaluate a TMS RFQ. Keynote presentations and panel discussions provide economic, trucking, and transportation updates.

MAY 2-4, 2016
Albuquerque, N.M.
42nd Annual Transportation & Logistics Council Conference
Transportation & Logistics Council
www.tlcouncil.org

General sessions cover the critical issues facing the transportation industry—including funding for infrastructure, capacity, and the impact of recent regulatory initiatives. Attendees also learn best practices for supply chain security—how to prevent theft, pilferage, and shortages throughout the supply chain.

MAY 15-18, 2016
Indianapolis, Ind.
ISM 2016 Annual Conference
Institute for Supply Management
conference.ism.ws

Global supply chain and procurement professionals gather to share supply management insights. Participants join eight live tracks with speakers that challenge and inform, covering themes such as tough lessons learned; big successes; mitigating disruption, and best practices.

MAY 15-18, 2016
Providence, R.I.
WERC 2016
Warehousing Education and Research Council
www.werc.org/2016

This conference focuses on education and practical takeaways for logistics and warehousing professionals. Sessions cover varied topics from WMS optimization in healthcare abd best practices in 3PL-shipper relationship management to reverse logistics.

MAY 17-19, 2016
Phoenix, Ariz.
Gartner Supply Chain Executive Conference
Gartner
www.gartner.com/events/na/supply-chain

At the conference, chief supply chain officers and their leadership teams learn how to create and manage a bimodal supply chain. The conference also explores hot-button topics such as key trends transforming global logistics through 2025, developing a flexible supply chain, and the supply chain implications of 3D printing.

SEPT 18-20, 2016
Houston, Texas
Intermodal Expo 2016
Intermodal Association of North America
www.intermodalexpo.com

Members of the intermodal freight community attend presentations on the technologies impacting intermodal and how to strengthen shipper/drayage partnerships. Presentations also cover recent trucking regulations and funding—and what it means for intermodal.

SEPT 25-27, 2016
Washington, D.C.
APICS 2016
American Production and Inventory Control Society
www.apics.org/annual-conference

The APICS conference explores best practices to create more sustainable, resilient, strategic, and value-driven supply chains. Participants receive insight on how to lead their organizations and achieve maximum productivity, meet consumer demand, and remain agile amid instability and unpredictability.

SEPT 25-28, 2016
Kissimmee, Fla.
CSCMP Annual Conference
Council of Supply Chain Management Professionals
www.cscmpconference.org

Supply chain management practitioners attend the conference to connect to the latest supply chain management knowledge, research, and industry developments. An exhibition showcases the latest equipment, systems, and technologies providing solutions to supply chain challenges.

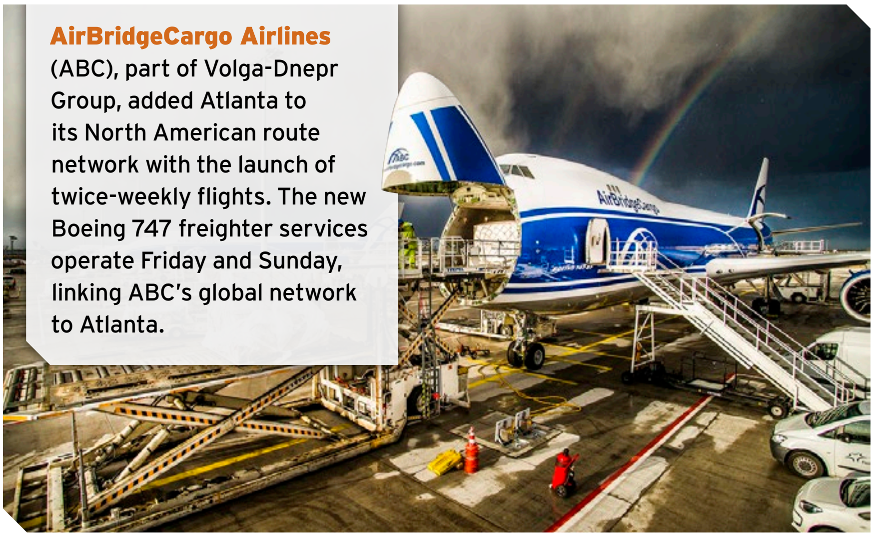
OCT 2016
Miami, Fla.
Annual Supply Chain & Logistics Summit
WTG Events
www.supplychain.us.com

Attendees hear the latest industry case studies as well as participate in keynote sessions and interactive master classes in this summit. Featuring six streams, the event incorporates two networking evenings, more than 40 sessions, a social and digital hub, and a product showcase.

//Transportation//

SeaLand, the regional ocean carrier of the Maersk Group, launched a new service dedicated to trade between the Gulf of Mexico and the eastern and central United States. The new SeaLand Atlantico service provides weekly coverage between the ports of Veracruz and Altamira, Mexico, and Philadelphia. With a six-day transit time, the offering is geared toward perishable goods shippers.

CaroTrans, a global NVOCC and ocean freight consolidator, launched a new, direct, biweekly LCL service between Miami and Manaus, Brazil, where container volumes have grown considerably since 2005. Manaus, in northwestern Brazil, is the main transport hub for the entire upper Amazon Basin, and is home to commercial and industrial parks occupied by electronics manufacturers such as Nokia, Panasonic, LG, Microsoft, Sony, Pioneer, and PhilCo.



AirBridgeCargo Airlines (ABC), part of Volga-Dnepr Group, added Atlanta to its North American route network with the launch of twice-weekly flights. The new Boeing 747 freighter services operate Friday and Sunday, linking ABC's global network to Atlanta.

United Cargo and **Lufthansa Cargo** are planning to cooperate on routes between the United States and Europe. The carriers are in talks to create a seamless network, aligning information technology services and warehouse facilities, and increasing the options available to cargo shippers.

UTi Worldwide, a global supply chain solutions provider, launched a new temperature-controlled shipping service connecting Belgium and Israel. UTi's LCL Pharma service provides an alternative to air freight for pharmaceuticals and other healthcare-related, temperature-sensitive products. UTi collects temperature-sensitive freight from across Europe. and delivers to its GDP-certified pharma hub near Brussels.

A. Duie Pyle, a provider of transportation and supply chain solutions, expanded its Protect From

The **CMA CGM** *Benjamin Franklin*, the largest cargo vessel to call at a U.S. port, arrived at the Port of Los Angeles on Dec. 26, 2015. The cargo vessel is the first 18,000-TEU-capacity containership to berth at a U.S. port. Extraordinary measures were deployed to handle its arrival at the Port of L.A.: nine cranes, 56 hours of operations, and approximately 11,200 container moves.

Freeze (PFF) service, which enables shippers of water-based products to transport LTL shipments with full protection from freezing temperatures. The carrier added 46 heated/insulated trailers and new heated transportation service centers in Westampton, N.J., and Wilkes-Barre, Pa.

Last-mile delivery network **Connect India** became a UPS Authorized Shipping Outlet through a new agreement. The service links UPS's global network with Connect India's last-mile capabilities. Connect India users in more than 50 cities, 650 district towns, and 8,000 small towns across India can book international shipments through Connect India Centers, which make use of UPS's global shipping services.

The Norwegian Coastal Administration (NCA) initiated the first full-scale trial of e-navigation in Norwegian waters in conjunction with NAVTOR, an e-navigation technology and services provider. In the test, the ferry *MS Stavangerfjord* digitally shared its routing information with NCA via NAVTOR's NavStation, a "digital chart table" gathering all the information navigators need into a single interface.

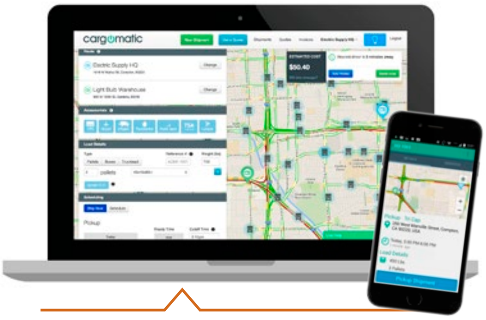
A&R Logistics, a provider of dry bulk transportation, packaging, distribution, and logistics solutions, purchased 48 new trucks that are fully compliant with new federal standards for fuel efficiency and greenhouse-gas emissions for heavy-duty vehicles. The 2017 Freightliner Cascadias, to be delivered in the second and third quarter of 2016, are equipped with a refrigerator, on-board bunk heater, and satellite radio connections.

IAG Cargo added import delivery to its Cargo Connector service. The offering takes freight direct from the aircraft, and delivers it to forwarders' handling facilities. With the addition of the import option to the export collection service, shippers benefit from reduced costs on incoming goods. The new service is available in eight U.S. airports: San Francisco, New York, Los Angeles, Chicago, Dallas, Atlanta, Seattle, and Houston for shipments weighing less than 660 pounds.

Wallenius Wilhelmsen Logistics (WWL), a RoRo shipping and factory-to-dealer logistics provider, increased frequency and capacity on its Atlantic Ocean service. WWL now offers a regular, weekly service from key ports in Europe to the U.S. West Coast.

// Technology //

HighJump, a global provider of supply chain management software, released an updated *AccellosOne WMS*, which features expanded e-commerce functionality to help users increase



B2B logistics technology platform Cargomatic launched service in the San Francisco Bay area, including Oakland and San Jose. Cargomatic's web and mobile apps connect shippers to nearby local truckers who have available freight capacity.

supply chain efficiency and accuracy. Shippers can reduce picker travel time with a wave-planning process that groups batch picks by item proximity, and decreases order preparation time with 100-percent paper-free picking, while maintaining full item visibility throughout the order lifecycle.

Software provider **Route4Me** added an auto check-in feature for drivers to its route sequencing and optimization platform. The new feature uses dynamic geo-fencing to eliminate the need for drivers to check in and out of locations manually. This is especially useful for drivers who deliver to many destinations per day.

FourKites, a provider of real-time load tracking and logistics visibility solutions, launched updates to its *ELD Control Center* to enhance communication between trucking companies and brokers and shippers. The enhancements let brokers and shippers define business rules and schedule email alerts to customizable groups of recipients who need status updates, such as truck arrival alerts.

Vigillo, a creator of big data and data-mining software products, launched a redesigned *Carrier Select*, a carrier selection tool for shippers that provides real-time data for analyzing motor carrier performance. The tool has moved from a downloadable application to a web-based one.

Lojistic, a provider of transportation cost reduction services and software, unveiled *Audisee*, its new instant parcel audit web tool. This free UPS and FedEx audit tool verifies bills, checks each invoice for common carrier invoice errors, and presents shippers with refund opportunities.

Global logistics provider **Yusen Logistics** and barcode technology company **SATO** jointly launched a global logistics IT solution to integrate purchase order, production and shipment, and transportation data to provide labor savings. The supply chain optimization tool uses barcodes and portable scanners to reduce manual data entry and documentation.

Business strategy advisor **Boston Consulting Group** (BCG) launched *xChange*, a web-based platform providing end-to-end functionality and allowing container carriers to reposition empty containers across the globe. In addition to decreasing the movement of empty containers by more than 30 percent, BCG expects *xChange* to save the container industry billions of dollars.

Paragon Software Systems, a vehicle routing and scheduling optimization solutions provider, released *Paragon Route Control*, a transportation planning system. With the new solution, transportation planners can use a calendar to create routes that comply with time- and day-related local, state, and national regulations, and accommodate road closures resulting from major public events.

Blue Ocean Robotics, a provider of robots and automation solutions, released a standard solution for 3D bin picking of small industrial parts. The Mini-Picker bin picking solution is available with the Universal Robots UR5 collaborative robot. The system is designed for machine loading of small parts, and will soon be available with additional robot brands to cover a wider range of parts.

Cold chain solutions provider Cryopak Verification Technologies introduced its new iMINI LCD single-use temperature monitor to help shippers meet increasingly stringent regulations for temperature-sensitive shipments in the pharmaceutical and food industries. The device comes pre-programmed with shipper-provided specifications to allow for temperature monitoring within a shipment.

FreightRun.com, a partnership of logistics and programming professionals, unveiled an online platform that allows shippers, distributors, and freight buyers to automate full truckload shipping programs. With its truckload pricing and online booking modules, FreightRun users can get pricing information in North America.

LeanLogistics, a global provider of transportation management applications and supply chain services, launched the latest version of its flagship product, *LeanTMS*. The system automatically assembles scheduled routes, offers simplified over, short, or damage capabilities that feed freight claim management and associated invoicing, and features enhanced carrier scorecards.

Digital Lumens, a maker of intelligent LED lighting systems, unveiled *LightRules Mobile*, an application giving users a convenient way to control and manage lighting settings from a mobile device or tablet. With *LightRules Mobile*, users can quickly adjust lighting settings in a broad range of applications, from manufacturing facilities to warehouses.

International Asset Systems, a cloud-based solutions provider for logistics and transportation management, added capabilities to its *ChassisManager* direct-billing system, which enables chassis usage to be billed directly to beneficial cargo owners (BCOs). The Port of Virginia's chassis pool is the first in the nation to implement this direct-to-BCO billing system designed to streamline chassis usage payment.

// Products //

Hydra Wagon Industries unveiled the HydraWagon 2016, a portable heater for tank and rail cars. The new machine provides circulating hot water at up to 200 degrees Fahrenheit, with heater output up to 275 degrees Fahrenheit, preventing liquids from gelling or freezing and becoming "stuck" in the rail tank car in cold temperatures. The HydraWagon 2016 is available on a skid or in an open or closed trailer.

Scandit, a developer of software-based barcode scanning solutions, introduced the Scandit Case, an iPhone 6/6s case that provides enterprise-grade scanning similar to that of a dedicated barcode scanner. Compatible with all of Scandit's mobile scanning solutions, the Scandit Case supports scan-intensive data capture applications across the entire supply chain.

Kafko International, a packager of automotive, household, and specialty chemical products, released the new Oil Eater Tuff Rug, designed to quickly absorb oil leaks, grime, and dirt in high-traffic areas including forklift aisles and warehouse walkways. Made of 100-percent recycled materials, Tuff Rug is underside fused through a heat and pressure process to produce a high level of absorbency while also retaining tear resistance.

Xplore Technologies, a manufacturer of rugged tablet computers, launched the XSLATE D10. With 4GB of RAM, 64GB of storage, an Intel CPU, and a full set of ports, the XSLATE D10 is designed for distribution/logistics managers and other professionals who need a rugged, lightweight tablet for use in the field.

Janam Technologies, a provider of rugged devices that scan barcodes and communicate wirelessly, introduced the newest addition to its XM series of mobile computers. Weighing less than 10 ounces and equipped with a 3.5-inch display, Janam's XM70 rugged mobile computer offers motion tolerance, as well as 1D and 2D barcode scanning with Zebra's SE4500 scan engine.

// Services //

Lineage Logistics, a temperature-controlled warehousing and logistics company, broke ground on the expansion of its Tacoma, Wash., cold storage distribution facility. The expansion project, which is planned for completion in 2016, adds more than 20,000 pallet positions of frozen warehouse capacity, and brings Lineage's total capacity in the Pacific Northwest to more than 93 million cubic feet of temperature-controlled warehousing space.

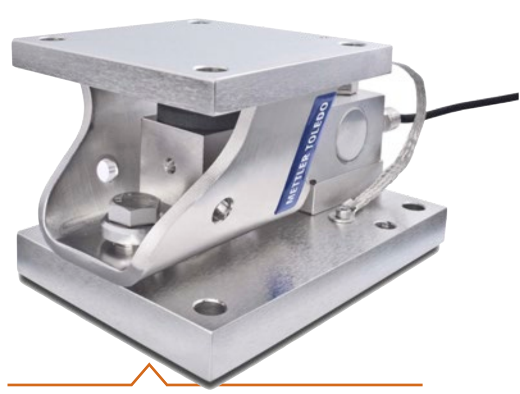
Global logistics provider **Dachser** opened a road logistics branch in Istanbul, Turkey, supplementing its air and sea logistics operations in Istanbul and Izmir. The new Turkey center supports import and export transport operations with links to its European network via the Dachser Cargoplus organization.

Hanson Logistics, a provider of temperature-controlled supply chain services, is constructing a new temperature-controlled facility to serve fruit and vegetable growers and processors in southwest Michigan. The new South Haven Logistics Center, located on 25 acres in the I-196 Industrial Park, enables the company to quick-freeze fresh blueberries and cherries, while supporting surrounding farms and food manufacturers with storage and distribution.

Foodservice supply chain solutions company **Consolidated Distribution Corporation** leased two warehouses at RidgePort Logistics Center in Wilmington, Ill. As a result of relocating to Wilmington and creating a new warehouse super center, the company can now handle refrigerated products, in addition to ambient and frozen. Both buildings offer rail service and 40-foot ceilings.

Supply chain management company **CEVA Logistics** opened its central distribution center (CDC) 2 at Shah Alam, Malaysia, 16 miles from Kuala Lumpur and close to Malaysia's main port in Klang. Constructed on the same site as CEVA's CDC 1 at Shah Alam, CDC 2 brings the combined warehouse footprint to more than 720,000 square feet, making it the largest site in CEVA's Southeast Asia cluster.

LTL freight carrier **Dayton Freight** relocated its Kalkaska service center to Grayling, Mich. Its new 32-door facility,



Mettler Toledo, a manufacturer of precision instruments, released an improved weigh module, designed for tank, silo, and conveyor weighing. The SWB505 MultiMount weigh module, for capacities from approximately 242 to 9,700 pounds, comes with load-cell technology for increased accuracy.

International transport and logistics company **Gebrüder Weiss** established a new Singapore site providing a broad range of warehouse and logistics solutions. The logistics terminal covers more than 107,000 square feet and is located close to the Port of Singapore *(pictured)*, the world's second-largest container port, enabling the company to offer connections to neighboring countries in Southeast Asia, as well as Australia and New Zealand.

set on 25 acres, is located right off I-75, allowing the company to offer faster LTL transportation service to shippers.

Logistics solutions provider **ProTrans** moved its Detroit facility from Belleville, Mich., to a new energy-efficient center located in Brownstown, Mich. With approximately 80,000 square feet, the Energy Star facility has 24 dock doors, trailer parking, and access to I-75. ProTrans Detroit offers transportation, warehousing/inventory solutions, and ProMex border processing.

Transportation and logistics solutions provider **Manitoulin Transport** opened a new transportation terminal located in Winnipeg, Manitoba, adjacent to its former terminal, which is now closed. The new terminal, equipped with all-electric forklifts, allows Manitoulin Transport to handle an increasing volume of shipments, supporting its growth in western Canada.

SEKO Logistics tripled its warehouse operations footprint in California by opening an omni-channel logistics hub in Chino and expanding into a new 200,000-square-foot facility in San Francisco. The recent investments were spurred by the rapid growth of its customers in the retail, solar, high-tech, aerospace, and medical industries.

International parcel and express service provider **DPD** opened a new superhub in Hinckley in the southwest of Leicestershire, England. The new distribution center handles up to 720,000 parcels daily. To achieve this capacity, the company installed sorting, distribution, and conveyor equipment from the BEUMER Group over a length of nearly two miles.

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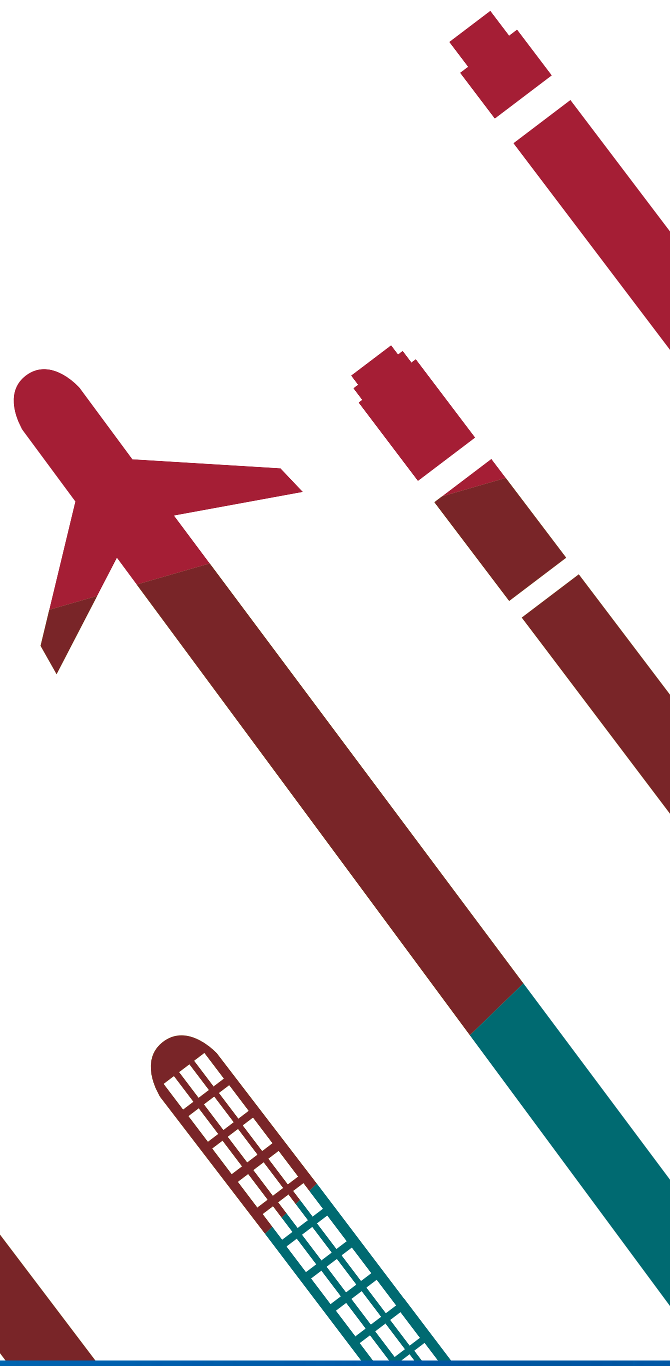

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