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INSIGHT

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ONLINE COMMENTARY

Calling All Logisticians: Assist the Military To Bridge the Gap bit.ly/AssistMilitary

Jay Hicks, LTC US Army (Retired), PMP, ITILv3, L6S

Professional logisticians and supply chain managers are in a unique position to ease military service members into supply chain jobs. Here's how you can help their transition.

The Keys to Hazmat Shipping Compliance bit.ly/DangerousGoodsHazmat

Robert Finn, Vice President, Labelmaster

The strict regulations governing dangerous goods and hazmat shipping are not going away. In fact, regulations may become more stringent. Follow these steps to avoid rejected shipments and better manage the process.

Truck Driver Health Should Drive Business Decisions http://bit.ly/TruckDriverHealth

Glenn Clinger, Partner, The Clinger Group LLC

Truck drivers are the lifeblood of the supply chain. A healthy dose of prevention can protect this invaluable asset, and ease the driver shortage.

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CHECKINGIN

Keith Biondo

by Keith Biondo | **Publisher**

Looking Beyond Your Desktop

The latest Ransomware attack lays bare hidden risks in your manufacturing, logistics, and supply chain network. You can protect against the ever-evolving threat of Bitcoin pirates by looking deeper into your operations.

The attack is introduced into networks with Spear Fishing emails. Once activated, the malware locks and ecrypts your files, and files across all infected computers on your network. The only way to get them back is to pay $300 in Bitcoin and hope the bad guys actually deliver the unlock (sometimes they don't). If your company is affected/infected, you have three choices, according to the FBI: revert to backup systems (if you have them done regularly), contact a security professional (many say this type of attack is not reversible), or pay the ransom. Your desktop may be protected because those computers are usually newer and have updated security patches.

Look Deeper

Operating systems most at risk are Windows XP, Vista, Windows 8, Windows Server 2003 and 2008. Experts agree, however, that no OS platform is completely safe because bad guys go where the money is.

Look one level deep, however, and you may find that you probably aren't protected. Some companies caught off guard–including Nissan, Renault, FedEx, Deutsche Bahn Rail, LATAM Air, and Telephonica Spain–have caused global supply chain disruptions for customers.

The Nissan case was particularly telling. Located in North East England, the Nissan Motor Manufacturing factory adjoins the UK Nissan Distribution Centre. It houses personnel, production control, engineering, finance, purchasing, logistics and information systems departments, and a number of on-site suppliers feed the production lines. That's a lot of interconnected computers. The facility typically produces more than 400,000 vehicles annually, but the WeCry attack knocked the plant down for more than a day.

Lesson? Look deeper into your manufacturing operating systems, manufacturing execution systems, and manufacturing operations management software applications, which sometimes rely on simpler devices running variants of older operating systems. How much did that Nissan shutdown cost? A lot more than 300 Bitcoins, that's for certain.

It's time to do a comprehensive enterprise security audit. Look past your desktop or set up a Bitcoin account–right now.

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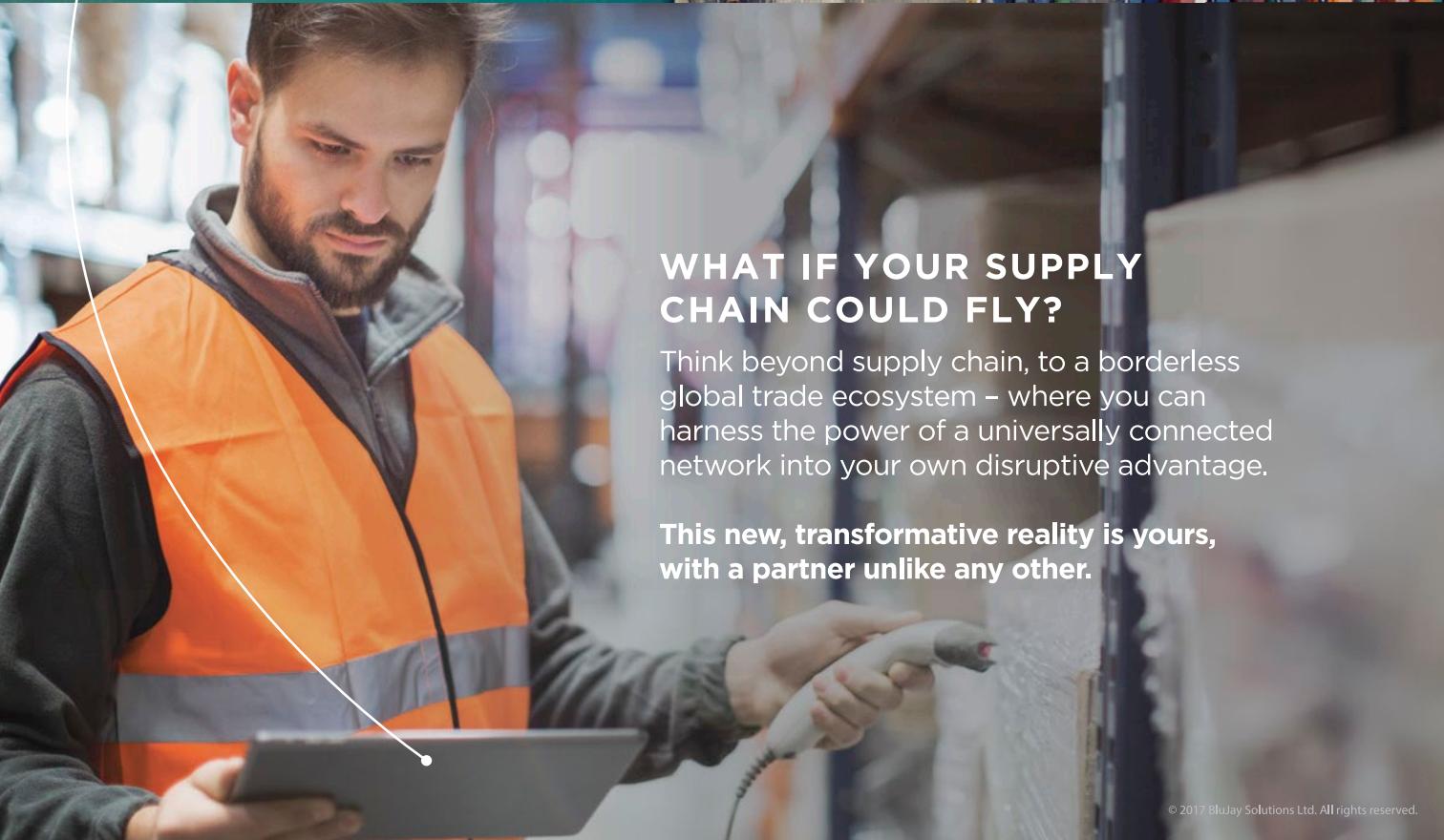
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To give readers another channel to interact with *Inbound Logistics*, we introduced the DiaLog phone line at **888-878-3247**.

This is your direct line to the *IL* team, and we are eager to hear from you. The line is open 24/7, so whenever the mood strikes, pick up the phone and tell us:

- The exciting work your company is doing in supply chain and logistics
- A bright idea that could change the supply chain

- Any topics you would like to see *IL* cover
- Feedback on our content
- Your response to the next Good Question: Will self-driving trucks affect your business in the next two years? How so?
- Reader Profile recommendations

Add **888-878-3247** to your phone's contact list, and we'll TTYL.

SOUNDBITE

"The world market has become more dynamic than ever before with growing sentiment toward nationalism, greater momentum toward corporate tax reform, and global trade at risk. To weather this change, supply chain organizations need to focus on fundamentals including the sales and operations planning process, inventory management, global trade management, and network optimization capabilities."

– **KEN KOENEMANN**, Vice President, Technology & Supply Chain, TBM Consulting Group

THEN   NOW

in EXCHANGE

We've Been Together for 35 Years
In April 2017, Editor Felecia Stratton marked her 35th anniversary at *Inbound Logistics*. She reflects on more than three decades of publishing evolution and non-stop technological revolution in logistics. bit.ly/35yearmilestone

Greg Thompson
Congrats! You guys continue to get better and more innovative with every year.

Lori Lockman
Congratulations on the milestone– and on putting together a consistently excellent publication year after year. Here's to 35 great years!

🐦 HASH IT OUT

@ILMagazine
Sophisticated supply chain modeling and simulation tools help companies predict the outcome of business scenarios. bit.ly/SCmodeling

Lukas Teijema @LukasTeijema
When the model is right. Without it, simulation is useless. And never underestimate tacit knowledge in teams.

HOT TOPICS | *IL* articles getting the most impressions on LinkedIn:
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Good Question…

READERS WEIGH IN

How will the Internet of Things affect the supply chain?

As the IoT expands, you'll see the source of internet traffic shift dramatically. Within the next five years, more than half of traffic will be generated by smart devices, enabling us to think about productivity in a radically different way.

Jeffrey Shorts
CIO, Neovia Logistics

IoT will provide supply chains with increased demand visibility resulting in agile supply chains that respond to changes in consumer trends in real time. The retail and CPG industries are already experimenting with IoT, and as the cost per unit price continues to drop, we will see the expansion of the use of IoT throughout all industries.

Paris Gogos
*Vice President of Product
NeoGrid North America*

IoT devices are already in the field collecting valuable data. We'll see advancements to where data collected can be used in machine learning to predict impacts from disruptions, make decisions, and automate processes that ensure products reach customers regardless of weather, traffic, or geopolitical issues.

Chad Lindbloom
*Chief Information Officer
C.H. Robinson*

Connected transportation, which equips vehicles with internet connectivity during travel, provides greater supply chain visibility, transforming supply chain management from a reactive activity to a proactive one.

Mike Skinner
*Vice President
CLX Technologies*

IoT means we have more data to improve service. Shippers are investing money in devices to implement IoT. That means they want to see a quick ROI, and in turn they expect their 3PL partners to improve in the areas of lower costs and on-time performance. I expect this will start to affect me by 2020.

Mike Dieter
*Chief Technology Officer
Transplace*

An estimated 5.5 million devices are joining the IoT every day, creating the opportunity to slash supply chain waste by $2.7 trillion in the next 10 years. Even sooner, 96 percent of all companies are expected to be IoT users within three years.

Kristi Montgomery
*Vice President of Innovation,
Research & Development
Kenco Logistics*

Like the air we breathe, IoT in logistics is becoming omnipresent. Go without it… and you'll notice!

J.P. Wiggins
Vice President of Logistics, 3Gtms

IoT-enabled Control Towers of Things (CToT)—extending today's supply chain visibility and control tower services to the level of things—are just around the corner. Traditional control tower experts such as 3PLs are strongly positioned to be CToT first movers.

David Frentzel
*Partner
New Harbor Consultants*

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Will self-driving trucks affect your business in the next two years? How so?

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TRANSPORTATION MANAGEMENT *Simplified*™

Choosing a Warehouse Management System

Not all Warehouse Management Systems (WMS) are created equal, and you must consider many variables when selecting one. The right WMS solution can streamline order fulfillment, increase inventory accuracy, enhance employee performance, and maximize equipment utilization. Above all, a WMS saves time and money while increasing customer satisfaction. Eric Lamphier, senior director of product management for Manhattan Associates, offers these tips to help you select a WMS.

1 Know what you need. Document, socialize, and refine your functional and technical requirements, priorities, plans, and integration needs. Before you meet with external parties, assign a weight to each group or bundle on your list to start constructing a decision-making framework.

2 Get others involved. A WMS selection, implementation, and support lifecycle affects many people. There are facility, change management and training, transportation, IT/technology, supplier, customer, customer support, e-commerce, multi-site, and labor impacts. Include third-party experts if you need to.

3 Allocate time for integration. A well-executed, multi-system integration is crucial. Fully documenting and testing the movement of data and workflows through enterprise business systems is important to achieving success.

4 Evaluate the technology and deployment. The underlying system architecture, third-party software components, and deployment strategy are important variables. Ensure the solutions run on technologies that are aligned with your corporate IT guidelines, and that IT business partners approve the deployment plan.

5 Minimize customization. From the onset, do everything possible to minimize customizations, especially to the system's core areas. Less customizations means less time, cost, and risk upfront, plus better support and easier upgrades in the long run.

6 Assess vendors. Do your research and determine what the WMS vendors are focused on. Review their company histories, talk to their customers, and ask about future plans and roadmaps. Attend their customer conferences and analyze financials.

7 Consider usability and mobility. Is the system easy to configure and personalize or does it require complex scripting or coding? Does it offer robust reporting, dashboards, intuitive user interfaces, and data visualizations? A first-rate WMS should also include mobile apps that allow management personnel to use it while on the move.

8 Plan for peaks and expansion. Forecast your growth and volumes for the next several years and plan ahead. Make sure your new WMS can handle future sites, users, SKUs, channels, and order volumes.

9 Look for significant value additions. Some WMS solutions offer functional capabilities such as labor management, supplier connectivity, and retail store management, which can help surface material benefits and ROI. Pre-integrated modules on a common platform can be implemented with less time and effort.

10 Think ahead. Make sure the current WMS software has what you need when it comes to functional capabilities and technology that can excel into the future. ■

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as told to Karen M. Kroll

Darrell Edwards: Furnishing a Lean Supply Chain Strategy

MORE THAN A DECADE AGO, LA-Z-BOY UNDERSTOOD the landscape of furniture was changing. One of our differentiators is offering personalized furniture. We looked at our current manufacturing platform and decided to convert from batch-and-queue line manufacturing to cellular or lean manufacturing.

We believed this strategic shift would enable us to offer more choices in custom, personalized furniture much faster. We also wanted to keep manufacturing in the United States. Converting to a lean strategy enabled us to meet our speed and customization goals, and continue manufacturing domestically.

La-Z-Boy's goal is to ship customer orders in four weeks or less. In 2015,

72.6 percent of orders shipped within four weeks. In 2016, 90.4 percent did.

We're also on a journey to become a zero-landfill company. We installed recycling receptacles throughout our manufacturing and distribution sites. We look at every possible waste item and try to identify a way to either recycle or reuse it within the business.

For instance, we receive products

Darrell Edwards is senior vice president and chief supply chain officer with La-Z-Boy Inc. He has held this position since 2014.

RESPONSIBILITIES

The global supply chain within the La-Z-Boy brand, including procurement, sales and operations planning, manufacturing, distribution, and research and development.

EXPERIENCE

Senior vice president of operations, vice president of manufacturing, vice president and general manager, all with La-Z-Boy; plant manager, bath rug division, Fieldcrest Cannon.

EDUCATION

Fox School of Business at Temple University, DBA, 2017; Thunderbird School of Global Management, Master of Global Management, 2009; Columbia Business School–Business Excellence–2007; University of Tennessee, MBA, 2003.

The Big Questions

When you're not at work, what do you like to do?
I love sitting in my La-Z-Boy and watching the University of Tennessee Vols play football.

What book impacted you?
I couldn't put down *Shoe Dog* by Phil Knight. It is so well written, and a great balance between a memoir and an account of how he founded Nike and grew the company.

If you could have dinner with anyone, who would it be?
One would be Winston Churchill. He was a brilliant, insightful, and

tremendous leader. The other would be Jack Welch. I have always admired his accomplishments as CEO at GE. I would ask how he was able to accomplish so much while navigating more than two decades of global business changes.

What advice would you give your younger self?
Find something you care about doing. It needs to be bigger than yourself, and it needs to be something that allows you to give back to others. Strive to create value, whether it be in your community or organization, or both.

shipped in boxes with corrugated dividers. We reuse the dividers to ship products either within our plants or to other plants.

We also reuse polyurethane packaging foam until it becomes unusable, and then we sell or give it to someone who can use it for other purposes. Additionally, we've partnered with local communities to identify items we can recycle, rather than take to a landfill.

Through years of work, we converted several facilities to zero-landfill sites. And we continue to work to become 100-percent zero landfill.

During college, I started work in one of Fieldcrest Cannon's manufacturing sites and absolutely fell in love with manufacturing. It's dynamic, it's challenging, and it creates a tangible product.

Over the years, my roles have expanded throughout the broader supply chain. Once we set our strategy for the business, my goal is to build a supply chain that supports it with speed, quality, cost, and execution.

Building a great team requires understanding the organization's mission and goals, aligning to them, and then executing against them.

I look at what La-Z-Boy does as something bigger than making great furniture that provides joy and comfort. We also enable people within our local communities to work in our factories, businesses, and distribution centers, and provide a good living for their families.

The difference between great supply chains and good supply chains is the people. Once you get the people equation right, everything else is reasonably easy. And I am incredibly fortunate to work with fantastic people within La-Z-Boy.   ■

LEADERSHIP

*Conversations With
The Captains of Industry*

By Merrill Douglas

David Congdon
CEO, Old Dominion
Freight Line

From the Front Lines to the Boardroom

DAVID CONGDON WAS 14 WHEN HE joined the family business: less-than-truckload (LTL) carrier Old Dominion Freight Line. "I started working on the dock in the summer," he says. "Making $1.65 an hour beat the heck out of a $3 weekly allowance."

At 16, Congdon started traveling to service centers in the Old Dominion network, working the docks in Durham, N.C., Richmond, Va., and Baltimore, and riding with pickup and delivery drivers. "I also started working as a truck mechanic on the weekends and the next couple of summers," he says.

After earning a Bachelor's degree in business management, Congdon headed to the North Carolina Truck Driver Training School in Raleigh. "I had been driving trucks around the yard since I was 14. But at the school I learned how to be a professional driver, and then I did local and over-the-road driving for about nine months," he says.

Having gained all that front-line experience, Congdon rose through the Old Dominion ranks by working in many different areas—industrial engineering, employee relations, fleet maintenance, and furniture hauling, among others—before the company named him president and chief operating officer in 1997. In 2008, he succeeded his father as chief executive officer. Congdon recently shared some insights about his role and leadership philosophy.

IL: Tell us about an experience early in your career that helped shape who you are as a leader.

In the 1980s, I was studying Total Quality Management (TQM) and applying those principles during my tenure in equipment maintenance and the furniture division. TQM principles are a big part of who I am and how I lead. In 1992, at a weekend management retreat, the company's president at the time declared that we needed to start a TQM process. My eyes lit up. On Monday morning, I was in his office and my dad's, volunteering to spearhead that process for the company. I led that initiative until I became president in 1997.

As vice president of quality, I was also managing the cargo claims and claims prevention departments. I recognized that part of doing a quality job is to do things consistently from one terminal to the next. I created a team whose job was to ensure consistency of process across the company. This team-based problem solving and process improvement approach was different from the company's style in the past.

IL: What's your leadership style?

The most important element is communication: having an open-door policy, listening carefully to suggestions, trusting my team, and encouraging them to go ahead with good ideas.

Also, I always talk about WIIFM—What's in it for me? You have to make sure your incentives are aligned with what you want to get done, so people can see what's in it for them when they do things in a certain way.

IL: What qualities do you look for in your leadership team?

You have to surround yourself with people who embrace the company's core values. Also, I look more toward soft skills than process skills. You can teach people how to do things, but if they don't have good people skills, they cannot be successful in any business.

IL: Tell us a story that illustrates a principle that's important to the way you lead.

In 1997, when I first became president and COO, we organized a long-range planning session for the entire leadership team. We wallpapered a whole room with all the ideas that became our vision for the company. At the time, Old Dominion was a regional carrier with just 75 service centers. We wanted to grow into a multi-regional, interregional, and national network. That meeting was a real turning point for the company, because of the way it got the team focused.

Over the years, I've come to the team with opportunities to acquire other companies. Each time, we weighed the pros and cons, and I listened to my team. If they thought it was not a good idea, and they articulated the reasons, often we'd drop the deal and move on to something else. It's important to listen to everyone's perspective. I can be swayed when I hear logical arguments for moving in a different direction.

IL: Which aspects of your job do you especially enjoy?

Interacting with people is always fun. I love to get out into the service centers when we do cookouts or open houses, and shake hands with the folks who are getting the job done on the front line. I also spend a lot of time talking with our shareholders. It's fun being out there when you're a leading company. We have the best operating margins in the industry, and our future for continued growth is strong. It feels great to share that story with our investment public.

IL: Who are some leaders you find most inspiring?

To my mind, the best leader is my father. He inspired me because of his focus on people and communications. Warren Buffet is also an inspiration—to be 86 years old and still have that clarity of thought. He has stuck to his core business principles and beliefs, and look where he is.

IL: When you're not working, how do you spend your time?

I love boats and water sports, and I've been putting more time into fishing. I'm involved in a lot of activities and organizations in my hometown, High Point, N.C., including Business High Point and Forward High Point, a group focused on downtown. I'm also involved in various American Trucking Associations committees. On the philanthropic side, I work with our local United Way and with the Earl and Kathryn Congdon Family Foundation. One program my parents started through that foundation provides college scholarships to children of Old Dominion employees.

IL: What advice would you offer a young person starting out on a career in logistics?

Develop a good system for time management. Always surround yourself with people who are smarter than you are. And if you want to get ahead, always put out 110 percent. If you do more than is expected of you, your boss will notice, and you'll get opportunities to grow and succeed. ∎

Next Step: Advanced Algorithms

Old Dominion Freight Line has implemented a lot of technology in the past 20 years. "We're doing most of the important processes for moving LTL freight through a network," Congdon says. "But there are still opportunities in optimizing line-haul operations."

The company makes a daily plan for moving long-distance freight through the network. But on a given day, if greater-than-average volume is bound for a particular city, planners try to build a direct trailer. "Then it gets even more complicated as freight moves through the breakbulks, where trailers are coming in from all different directions," Congdon says.

Supervisors and managers have tools that help them assess the situation and then figure out the best way to route each day's line-haul freight. "They've got good heads, because they make it happen every day," Congdon says. "But it could be optimized further."

The solution probably lies in advanced algorithms, but "nobody has cracked that nut yet," he says.

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NOTED

THE SUPPLY CHAIN IN BRIEF

GREEN SEEDS

▼ **Yusen Logistics (Americas)**, a third-party logistics provider, completed an LED light retrofit project that will reduce electricity usage and expense by more than 60 percent at one of its warehouses at its Carson, Calif., campus. The company recently replaced 966 fixtures with energy-efficient LED lights at the 486,000-square-foot facility, the largest warehouse in its network. The retrofit will reduce energy use on average by one million kilowatt-hours per year.

Lufthansa Cargo was named a Preferred Carrier by DHL Global Forwarding, and was awarded a GoGreen Carrier Certificate. Lufthansa Cargo was the only airline to score full points, achieving top marks in all four of the GoGreen Carrier Rating categories. The cargo airline was rated according to the following criteria: carbon efficiency; commitment to harmonizing CO_2 calculation and reporting standards and to other environmental projects (engagement); level of detail and quality of the CO_2 efficiency data provided (transparency); and the degree of trust and cooperation.

m&a

DAVACO , a provider of high-volume programs for retail, restaurant, and hospitality brands, merged with **Crane Worldwide Logistics**, a provider of customized logistics solutions. The partnership between the two companies provides solutions from purchase order placement, to the installation and refresh of brands, to the execution of brand initiatives at each location. Crane Worldwide's services include air, ocean, trucking, and customs brokerage to support DAVACO's global reach and ability to carry out brand initiatives directly from manufacturing plants.

Logistics provider **Dachser** became a majority shareholder in **Johnston Logistics**, its partner in Ireland: This acquisition allows Dachser to expand its logistics network throughout northwestern Europe. In addition to groupage services, Johnston Logistics specializes in shipments of dangerous goods and warehousing services for shippers in the chemical, pharmaceuticals, hardware, plastics, and packaging industries.

GOOD WORKS

Transportation provider **Leonard's Express** is supporting the Breast Cancer Coalition of Rochester by donating a penny for every mile its pink ribbon trucks travel. Its trucks with ribbon decals recently logged more than 1 million miles on the road, bringing the company's total donation to date to more than $10,000.

UP THE CHAIN

Retailer **Nordstrom** hired **Brent Beabout** as its new executive vice president of supply chain. The former Walmart and Sam's Club executive brings years of experience in e-commerce supply chains to Nordstrom, which has invested heavily in e-commerce technology. In his new role, Beabout helps ensure supply chain operations support e-commerce customer expectations.

SEALED DEALS

KENZO, a luxury ready-to-wear apparel company owned by the LVMH group, chose supply chain solutions provider **GEODIS** to handle its global logistics operations from France. With a dedicated team of 70, GEODIS receives, stores, and prepares KENZO's clothes, leather goods, shoes, and accessories, under the five-year partnership. Located south of Paris, GEODIS' logistics campus, which has storage and preparation facilities adapted to folded and hanging garments, was selected to centralize these operations. GEODIS also helps KENZO with its e-commerce sales channel by fulfilling orders.

Aircraft maker **Airbus** selected the STICKNTRACK geo-localization and asset tracking services from provider **SENSOLUS** to optimize its supply chain. With this solution, Airbus tracks aircraft spare parts in real time as they transit through various warehouses and international departments. STICKNTRACK improves the management of Airbus' supply chain by letting it quickly address unexpected events, such as delivery delays or loss.

recognition

▼ **Averitt Express**, a provider of freight transportation and supply chain management solutions, was named ChemTreat's **Regional LTL Carrier of the Year** for 2016. The industrial water treatment company selected Averitt based on several criteria, including on-time service, safety, and day-to-day interactions with ChemTreat facilities.

Penske Logistics received the Lowe's **Gold Carrier Award** for the second consecutive year. The award recognizes trucking companies that provide a consistently high level of service exceeding 99.5 percent on-time delivery. In addition, gold status carriers must exemplify outstanding customer service and advanced supply chain solutions.

For the second consecutive year, cross-border logistics provider **Purolator International** won a **2017 Eggie Award** as retailer Newegg's Best International Logistics Partner. Purolator has helped Newegg deliver to its Canadian customers for the past eight years. The Eggie Awards recognize outstanding contributions from the tech-focused e-retailer's valued partners, vendors, and customers.

Wave Reaction, a reusable container management company, received a John Deere **Supplier Innovation Award** for 2016. The award recognizes John Deere suppliers that have demonstrated innovation in a product or service they provide. John Deere bases its award selections on creativity, feasibility, collaboration, and bottom-line impact.

TRENDS

SHAPING THE FUTURE OF LOGISTICS

Delivery Robots: Coming to a Sidewalk Near You

by Jason McDowell

Major package delivery stakeholders such as UPS, FedEx, DHL, and Amazon have poured considerable resources into technology that will deliver packages by airborne drone. But their efforts face constant regulatory obstacles that slow the speed at which the technology can be tested and developed. In the meantime, a start-up is testing an idea that has its feet more firmly on the ground.

Marble, a California-based maker of autonomous ground-delivery robots, teamed up with Yelp Eat24 to test food deliveries in San Francisco. Running on technology similar to self-driving cars, Marble's robots can safely share city sidewalks with pedestrians, using artificial intelligence to continually improve the way they operate. They travel about three to four miles per hour, and can hold up to four bags of food.

As the robots travel around the city, they map sidewalks so they can make more efficient deliveries in the future. For the time being, a Marble employee accompanies

each robot to answer questions from the public and intervene in the event of an emergency or equipment failure. The robots are also monitored remotely, and operators can speak to customers through them.

"We're creating a more efficient, reliable, and affordable way for people to receive what they need and want from their cities while reducing urban congestion and carbon footprint," said Marble CEO and co-founder Matt Delaney in a press statement. "Our system bolsters local commerce and unlocks the full potential of the on-demand economy, allowing it to be something that everyone can benefit from."

Ground-bound Deliveries

While initial testing focuses on food delivery, developers see potential for several other applications. Groceries, pharmacy prescriptions, and last-mile package delivery are on the horizon for Marble's robots. While airborne drones get tied up in regulatory battles, the concept of small package delivery by ground-bound robots hasn't faced as

Customers opting for food delivery via robot receive a pin code that unlocks the cargo bay when their Marble delivery arrives. After retrieving their food, they close the door and the robot returns to Marble or to another restaurant.

much opposition from lawmakers and government agencies.

"With the rapid growth of the on-demand and e-commerce markets, solving the last-mile delivery problem is incredibly important," said Greg Reichow, general partner at Eclipse, a major investor in Marble, in a press release.

Marble faces competition from other delivery robot manufacturers, such as Dispatch and Starship Technologies, which also have test robots out in the world. With the concept catching on, it may not be long before delivery robots are a common sight on U.S. roads and sidewalks.

J.B. Hunt and U of A: Class Act

When industry and academia team up, benefits abound. Consider a new collaborative effort between J.B. Hunt Transport Services, Inc., a transportation services company based in Lowell, Ark., and the University of Arkansas to advance supply chain management efficiency through technology.

J.B. Hunt is investing $2.75 million in the University of Arkansas to create the J.B. Hunt Innovation Center of Excellence, a joint effort between the company, the College of Engineering

J.B. Hunt is making a $2.75-million investment in the University of Arkansas to create the J.B. Hunt Innovation Center of Excellence.

and the Sam M. Walton College of Business.

The center will enable engineering, computer science, and business researchers and students to work with J.B. Hunt employees in finding solutions to real-world problems through innovative design and technology-driven supply chain solutions.

"The J.B. Hunt Innovation Center of Excellence will allow us to pursue revolutionary ideas in supply chain technology that can have a game-changing impact on the industry," says Stuart Scott, chief information officer at J.B. Hunt. "The innovative ideas that will shape our industry's future are with the students of today."

As a graduate of the Walton College, Shelley Simpson, chief marketing officer and president of integrated capacity solutions and truckload at J.B. Hunt, has seen firsthand how the university's programs and research have been beneficial to the company.

"As our industry evolves, customers need more intelligent supply chain solutions to meet market demand," says Simpson. "This collaboration is an investment in the future of J.B. Hunt and our ability to deliver customer value."

To learn more about this unique partnership, *Inbound Logistics* spoke with Tracy Black, senior vice president of information technology at J.B. Hunt.

IL: What motivated J.B. Hunt to partner with the University of Arkansas?

TB: J.B. Hunt has a long-standing relationship with the University of Arkansas. We've collaborated on projects in the past and had great success. J.B. Hunt University, for example, pairs students with supply chain partners to help improve their business operations and develop innovative solutions to solve the most pressing industry challenges.

The University of Arkansas has some of the most talented students in the country studying transportation and logistics. The Sam M. Walton College of Business is ranked 26th among public undergraduate business schools, its supply chain management specialty is ranked in the Top 15, and the university's department of industrial engineering recently moved up to 32.

Many of our J.B. Hunt professionals and engineers, including some of our executive leadership team, are graduates of the University of Arkansas, so we know the quality of talent the college produces.

IL: Besides the obvious impact on the university and J.B. Hunt, what are the broader ramifications? Do you see this trend of private companies partnering with academia continuing?

TB: It's typical for private businesses in this industry to partner with universities and study one particular field, but J.B. Hunt is pioneering this approach of broader collaboration across multiple disciplines and colleges. This trend will undoubtedly continue as technology's influence on the supply chain becomes greater.

We can no longer think in a silo; to remain a leader in this industry, we need to collaborate across business and engineering fields and the multiple disciplines within each, such as finance, supply chain, data analytics, mathematics, industrial engineering, and computer science.

IL: We hear an awful lot about a talent gap in our industry. How will this collaboration address that issue?

TB: Talent availability is a big challenge affecting our industry. In general, businesses are realizing the growing impact logistics has on customers, and they are looking for creative solutions.

The Innovation Center will focus on projects that contribute to automating and providing intelligence into our logistics system. This will give students a chance to gain broader understanding of overall supply chain challenges and equip them for entering the workforce.

GLOBAL

THE WORLD AT A GLANCE | **by Jason McDowell**

UK-China Freight Train Makes the Connection

Details of the trade future between the United Kingdom and the European Union may be uncertain, but the UK's trade with China is on track—literally.

The Chinese government's "One Belt, One Road" initiative checked off another milestone in April 2017 as a freight train left London's DP World London Gateway, bound for Yiwu in eastern China's Zhe Jiang province. The China-bound train marks the next logical step after a train completed a journey in the opposite direction—from China to the UK—in January 2017.

The One Belt, One Road program seeks to re-establish ancient Silk Road land connections with Western trade partners that existed for more than 2,000 years, but have fallen into disuse in favor of air and ocean transport.

"This new rail link with China is another boost for global Britain, following the ancient Silk Road trade route to carry British products around the world," said Greg Hands, minister of state in the UK's Department for International Trade, at a ceremony commemorating the event. Those gathered for the celebration watched the last three containers get loaded before the train departed.

The freight train's nearly 7,500-mile journey takes it through the tunnel, where it then travels across France, Belgium, Germany, Poland, Belarus, Russia, and Kazakhstan before crossing into China. Freight carried on the inaugural journey included soft drinks,

vitamins, pharmaceuticals, whiskey, and baby products. DB Cargo handles the leg between the UK and Germany, where InterRail Group takes over and completes transport to China.

"Restoring the ancient Silk Road as a means by which China, North Europe, and now the UK can exchange goods is an important and exciting initiative," says Xubin Feng, chairman of Yiwu Timex Industrial Investment Co., a key stakeholder involved with organizing the service. "This is the first export train and just the start of a regular direct service between the UK and China."

Asia Accelerates Contract Logistics Growth

The overall contract logistics market grew by approximately 3.9 percent in real terms in 2016, according to TI's *Global Contract Logistics 2017* report. Despite stronger global growth in 2016, many developed markets struggled to match even the modest growth rates seen in their contract logistics markets in 2015. This reflects trends in the global economy, where growth rates in advanced economies slowed overall.

It would be too easy to match these struggles to the impacts of political events such as the U.S. presidential election and the Brexit vote. In 2016, Barack Obama was still the U.S. president and the European Union had 28 members. Instead, weak real wage, productivity, and consumption growth dampened global economic growth. Tepid retail sales and manufacturing production growth, in particular, greatly affected the contract logistics market, says the TI report.

On its own, this information suggests contract logistics will continue to struggle. After all, it is a market associated with formalized retail structures, developed for large corporations hoping to achieve operational efficiency. Emerging markets, however, are taking an ever-larger slice of the pie. In fact, in 2016, Asia Pacific became the largest regional market for third-party logistics, overtaking Europe, notes the TI report.

Asia Pacific's strength is a result of many factors. Sustained robust economic growth coupled with continued retail formalization (thanks to rising disposable income) powers retail contract logistics. Meanwhile, multinational manufacturers increasingly consider production locations outside China, especially nearby ASEAN, thanks to cheaper labor costs.

But even with rising wages, manufacturing in China is still undeniably strong. By moving up the chain to more value-added production, China was able to offset the departure of low-cost manufacturing.

While Europe and North America suffer from stagnating retail sales and manufacturing growth, Asia is driving growth for the global contract logistics market as a whole. This trend is likely to continue.

While economic growth rates in developed nations are forecast to pick up slightly, emerging markets will continue to far surpass them.

Under Contract

Key takeaways from TI's Global Contract Logistics 2017 report:

■ The global contract logistics market grew by 3.9 percent in 2016, up from 3.7 percent in 2015.

■ Asia Pacific has overtaken Europe as the biggest market for contract logistics.

■ Seven of the 10 largest markets grew at a slower rate than in 2015.

■ The market is forecast to grow at a real 2016-2020 compound annual growth rate of 4.8 percent.

Will Stagnant World Trade Hurt Air Cargo?

Global airfreight demand, measured in freight tonne kilometers, grew by 3.8 percent in 2016 compared to 2015, according to data released by The International Air Transport Association (IATA). This was nearly double the industry's average growth rate of 2 percent over the past five years. Freight capacity, measured in available freight tonne kilometers, increased by 5.3 percent in 2016.

All regions except Latin America experienced positive freight growth in 2016, notes IATA. Carriers in Europe accounted for almost half the total annual increase in demand.

After a weak start to 2016, global freight volumes recovered in the second half of the year. A strong peak season, an increase in silicon materials shipments, and a turnaround in new export orders contributed to the later uptick in demand. The early timing of the Lunar New Year—in January 2017— may also have helped push demand higher in December, IATA reports.

Here's the growth by region:
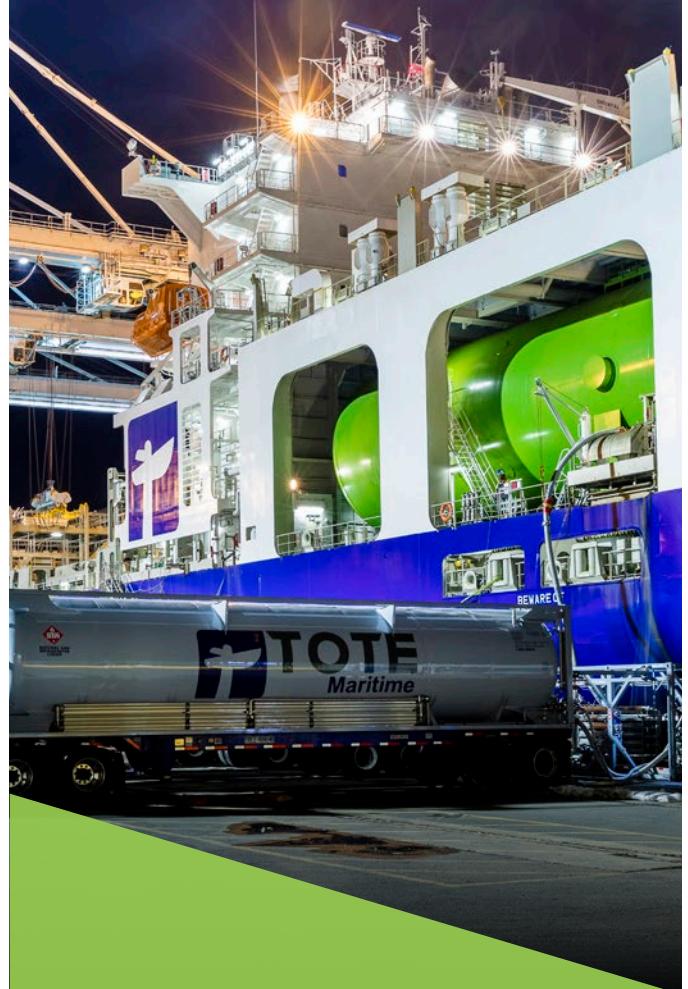
■**Asia-Pacific carriers** saw freight volume demand grow 9.8 percent in December 2016 compared to the same period in 2015. Capacity grew by 5.7 percent. This contributed to freight demand growth of 2.1 percent in 2016 compared to 2015, and slightly below the 2.3-percent increase the previous year. However, seasonally adjusted volumes are now back to 2010 levels during the bounceback from the global financial crisis.

■**North American airlines** saw freight demand increase by 3.7 percent in December 2016 year-on-year and capacity decrease 1.4 percent. This contributed to modest annual growth in 2016 of 2 percent, up from 1.3 percent the previous year. Capacity grew by 3.4 percent in the 2016 calendar year. The strong U.S. dollar continued to boost the inbound market but kept the export market under pressure.

■**European airlines** posted a 16.4-percent year-on-year increase in freight demand in December and a capacity rise of 5.9 percent. The healthy results helped boost cargo volumes for the 2016 calendar year by 7.6 percent—the largest increase of all regions, accounting for almost half the total global annual increase in freight demand. Capacity increased by 6.7 percent in the 2016 calendar year.

■**Middle Eastern carriers'** freight volumes increased 11.2 percent year-on-year in December and capacity increased 5.9 percent. This contributed to an annual increase in demand of 6.9 percent in 2016—the second fastest growth rate of all the regions. However, this was the region's slowest pace of growth since 2009 and well below the 12-percent average annual rate seen over the past decade. The slowdown is mainly due to weak freight volumes between the Middle East and Asia, and the Middle East and Europe.

■**Latin American airlines** experienced a demand contraction of 1 percent in December 2016, compared to the same period in 2015 and a 7.9 percent decrease in capacity. The drop in demand was reflected in the region's 2016 overall performance—a 4.2-percent decrease in freight volumes, the second consecutive year that demand has fallen. Despite this, in seasonally adjusted terms, growth levels are in line with where they were at the start of 2016. The region continues to be blighted by weak economic and political conditions, particularly in Brazil.

■**African carriers** had the second-fastest growth in year-on-year freight volumes, up 13.6 percent in December 2016 and a capacity increase of 5.3 percent. This contributed to an annual growth in freight demand of 3.1 percent in 2016, down from 4.5 percent in 2015. However, capacity surged by 25.5 percent in the 2016 calendar year on the back of long-haul expansion, particularly by Ethiopian Airlines, causing a fall in the freight load factor.

How to Decide if You Should Outsource Your TMS

DO YOU NEED A HOSTED OR IN-HOUSE TMS?

The days of the in-house transportation management system (TMS) are fading. Sure, there are a few benefits to building a custom system. It's designed for a shipper's specific needs, and all the data gathered stays in the family, so to speak. Yet, there are problems. Many shippers find their custom systems don't communicate properly with software in use by their carrier partners and service providers. Others find themselves with a bit of buyers' remorse, as the speed of technology development leaves a custom system lagging within only a couple of years.

However, thanks to cloud computing, shippers of all sizes can now afford to foot the bill for a transportation management system and stand on equal footing with the giants. Hosted solutions, or Software-as-a-Service (SaaS), leave all the costly headaches of hardware installation with the provider, allowing for faster deployment. Standardized forms and reports enable easy integration with partners, and support and continuous improvement experts are available without needing to keep extra personnel on staff. SaaS also receives frequent updates, so it stays current with leading-edge technology developments. An up-to-date TMS ensures shippers benefit from all the network efficiencies—such as better reporting, improved exception tracking, and easier load consolidation—that come from increased supply chain visibility.

Many executives fear giving up control of their data to a third party, but most hosted solutions allow companies to back up data on their own servers, and/or provide quick and easy access to data. After all, the provider may own the TMS, but the shipper owns the data that TMS generates about their company.

Of course, there are reasons to build a custom system. Perhaps a shipper has rare or unique transportation requirements that aren't covered by standard commercial hosted solutions, in which case the financial investment involved with hardware installation and maintenance of a custom solution may be worth the trouble. Unless that's the case, for most shippers, an outsourced solution will save both time and money.

Every shipper is different, so in the end it comes down to the specific requirements and resources of each to decide if they need an in-house or outsourced system. Here are four factors to consider when deciding which is right for your company:

● **1. What's your budget?** One of the biggest draws for a SaaS solution is reduced cost. A custom-built, locally hosted solution will cost big up-front and incur long-term maintenance costs. A hosted solution boasts reduced up-front cost, but typically requires an ongoing transaction fee.

● **2. How many partners?** Shippers who outsource to carriers and logistics providers will enjoy the ease of standardized reports and forms that comes with a commercial hosted TMS. Companies who have private fleets can avoid these concerns if they decide to go in-house.

● **3. What do you know?** A hosted solutions provider offers access to best practices, key performance indicators, pricing, service levels, and benchmark information gathered on a larger scale than any individual shipper could manage. A company would require a full and knowledgeable transportation team in-house to compare.

● **4. What's your support level?** SaaS providers offer support and have teams working to keep hosted solutions functional and updated. An in-house solution will most likely require dedicated staff or contract personnel to handle updates and maintenance.

TMS IMPROVES ON-TIME DELIVERY AND INCREASES VISIBILITY

Kuebix saves a National Powertrain Supplier over $270K by increasing supply chain visibility and empowering better decisions.

THE CUSTOMER

Holman Parts Distribution

Pennsauken, NJ, USA
National OE powertrain parts supplier to dealerships and large fleets.

SOLUTION PROVIDER

Kuebix

Maynard, MA, USA
Cloud-based TMS that provides visibility and increased efficiency to any supply chain.

OVERCOMING KEY HURDLES

Holman Parts Distribution began searching for a transportation management system (TMS) during the fall of 2015 with operational goals of minimizing cost overages due to inefficient carrier selection, improving on-time delivery and increasing supply chain visibility. On the financial front, Holman Parts had too many human resources allocated to manual freight invoicing and was grappling with frequent payment of incorrect invoices.

THE SOLUTION

Holman Parts implemented Kuebix TMS across eleven U.S. locations. Holman Parts' employees were able to immediately begin utilizing Kuebix, because it is a turn-key SaaS solution. Within 10 days, the Kuebix team had integrations in place with Holman Parts' carriers for automated freight audit and pay.

MEASURING THE RESULTS

Holman Parts received instant ROI from Kuebix's rating engine as the logistics team began selecting the best carriers for each lane vs. carriers based on "tribal knowledge" or "gut feeling."

Within one year of implementing Kuebix, Holman Parts Distribution realized:

- **Freight savings of $272,000** by selecting the more cost-effective carrier for each shipping zone.
- Time to book shipments reduced from eight minutes to just 90 seconds.

- On-time delivery rates increased due to Holman Parts' ability to match the right shipments with the right carriers and to quickly react to problems like delayed shipments.
- Automatic invoice audit reduced Holman Parts' payroll team headcount while allowing it to reallocate those resources to other projects.

> *Since implementing Kuebix, we've gained a significant competitive advantage and improved overall profitability.*
>
> — **John Conte,** Logistics Manager, Holman Parts Distribution

- Overpayment protection on freight invoices gives Holman Parts immediate visibility into exactly how much it's paying at the point of carrier selection.
- Standardized processes and data across all 11 physical locations support complete, end-to-end visibility and enable better decision-making.

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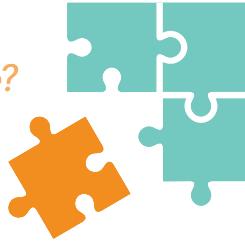
Retailer Reduces Transportation Spend

A retailer teamed up with Unyson to create an out-of-the-box solution for its growing supply chain.

THE CHALLENGE

A leading e-commerce retailer was looking for a dynamic service provider that could produce out-of-the-box results for their rapidly growing supply chain. The company sought to reduce their transportation spend, condense inbound loads to their Fulfillment Centers (FCs), and shorten overall transit for their Less-than-Truckload (LTL) freight.
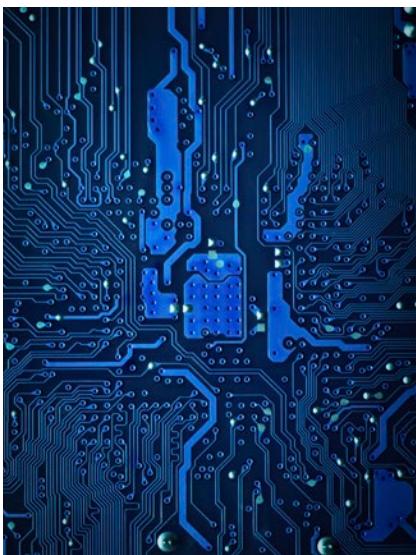
THE SOLUTION

After conducting a network analysis, Unyson executed a series of enhancements to the retailer's supply chain. Initially, Unyson created a new, strategic carrier mix to service the customer. Unyson's leverage in the industry allowed for reduced rates and increased on-time service.

Next, Unyson implemented three new crossdocks to lessen transit times for 400,000 annual shipments. With the use of a crossdock, Unyson was able to consolidate products from multiple vendors and condense the amount of inbound freight to the retailer's FCs.

Additionally, through Oracle Transportation Manager, dashboard analytics, and a dedicated account team, Unyson increased the customer's overall visibility to their vast network. The dedicated team produces weekly scorecards with a myriad of KPIs that are crucial to the retailer.

Moreover, Unyson manages compliance for their 7,800 vendors. This 24/7 monitoring, coupled with industry-leading technology, allows the team to be agile to ever-changing needs and requests from the organization, which include varying EDI mapping and a vigorous peak season.

The customer has already begun to recognize monthly exponential savings in their network. Due to the savings, visibility, and service enhancements, Unyson is projecting a growing partnership with the retailer well into the future.

UNYSON

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at Lehigh University and author of books on Lean for
McGraw-Hill, and supply chain for Pearson
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What's Your Sourcing Strategy?

Having a current, flexible sourcing strategy can not only reduce costs and increase efficiency, but also serve as a competitive advantage to help organizations increase the top line.

Supply chain costs, primarily procurement and transportation, can range from 50 to 70 percent of sales, depending on industry. So it is critical to spend considerable time on developing your organization's strategy. Periodically reviewing your sourcing strategy ensures you will achieve desired results and continue to align with business objectives.

Successful sourcing requires a thorough understanding of a company's business strategy, the resources required to deliver that strategy, and the market forces and unique risks within the company associated with implementing specific approaches.

Some sourcing strategies to consider:

- **Outsourcing.** Having suppliers provide goods and services that were previously provided internally.
- **Insourcing.** Delegating a job to someone within the company.
- **Nearsourcing.** A business places some operations close to where its end products are sold to save time and money.
- **Vertical integration.** Merging companies at different stages of production and/or distribution in the same industry. When a company acquires its input supplier it is called backward integration; when it acquires companies in its distribution chain it is called forward integration.
- **Few or many suppliers.** A many-supplier strategy is commonly used for commodity products and purchasing is typically based on price. Single-source purchasing refers to purchases from one selected supplier, even though other suppliers provide similar products. Sole-source procurement refers to purchases with only one supplier. Single- or sole-supplier relationships can be high risk, but reap big rewards.
- **Joint ventures.** A business entity created by two or more parties, generally characterized by shared ownership, shared returns and risks, and shared governance.
- **Virtual enterprise.** A network of independent companies (i.e., suppliers, customers, competitors) linked by information technology to share skills, costs, and access to one another's markets.

In many organizations, procurement focuses primarily on cost reduction, which perhaps should be one focus if the company has a cost reduction strategy. In today's competitive world, however, where most companies don't focus only on cost as a strategy, there tends to be more emphasis on creating value, while not ignoring cost and waste reduction.

Finding Value Areas

In general, moving toward lean procurement will help you increase total value. While concepts such as just-in-time are lean tools that focus on inventory waste, many other areas in procurement can benefit by:

- Improving the procurement process itself as well as workflows; thereby reducing time and eliminating waste.
- Reducing or lowering costs while improving both product and service quality.
- Improving supplier performance and responsiveness.
- Increasing focus on activities that add value to the firm.
- Enhancing procurement's strategic rather than transactional focus.

Implementing an agile sourcing strategy provides a competitive advantage to help companies lower costs and improve efficiency. ∎

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[**RISKS & REWARDS**]

BY CHLOE DEMROVSKY
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5 Steps to Protect Your Supply Chain From Cyber Threats

With cyber threats affecting organizations worldwide, warding off cyber attacks and protecting against cyber espionage is becoming a top priority across industries. Manufacturers, distributors, and organizations, however, are not doing enough to make supply chains more resilient and prepared.

Whether your business is large or small, a startup or 40-year veteran, major security issues stem from not actively assessing your risk profile. Organizations can take the following five steps to limit the risks associated with cyber threats, and protect the supply chain:

1. Put an incident plan in place. Well-planned decision making in the era of cyber risk is an important factor in protecting a company, and ultimately, a supply chain. When it comes to cyber threats, you need a response program in place *before* a breach happens. By drafting and implementing a strong plan, companies can take the necessary steps to address weaknesses and avoid becoming the target of the next attack.

2. Conduct penetration testing every year. Companies should assess their risk profile and address weaknesses. Only one-third of companies surveyed in Sikich's *2016 Manufacturing Report* say they conduct penetration testing annually. By conducting vulnerability scanning, companies can protect their supply chain, patents, designs, and more from falling victim to a cyber threat.

3. Don't be the weak link. Whether warehouse worker or CEO, security is everyone's job. From locking the office door when you leave for the night to encrypting confidential files on a server or in an email—every person and action plays a vital role in ensuring the organization's safety. Hold all employees accountable for their actions, and provide a basic understanding of cyber security, the risks, and how to ward off threats. This can prevent your company and supply chain from becoming the weak link and an easy target.

4. Add depth and breadth to basic security practices. Organizations should raise awareness among employees and protect their community—steps that can make a company more attractive to potential customers.

So what can organizations do? Some companies require employees to change their passwords every 90 days. Others choose to have key cards over keys for entering secure areas in order to record entry and exit data. Each company has unique needs, but can benefit from understanding best practices and making decisions based on its risk appetite.

5. Build security assurances into vendor agreements. While third-party vendors aren't employees of your organization, they do work for you and should be held to the same— if not higher—level of accountability. Companies should consider working with their legal teams to add security elements into vendor and partner agreements—such as an incident response plan and data security policy in addition to requiring all third parties to test those plans in joint exercises.

Adopting and implementing cyber-security standards build a safer environment for supply chain operations. Cyber criminals are relentless; not investing in cyber-security measures could derail your business. Taking proactive measures now can close that critical gap in your organization's security. ■

BY PETER SOBOTTA
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Finding Untapped Value in Product Returns

The little-known, but dark secret of e-commerce is this: On average, for every three packages a retailer ships, one will be an eventual return. Retailers must shift their focus to processing the continuously increasing number of returns.

As retail grows more reliant on analytics, retailers are seeing previously untapped value in data about who is returning merchandise, and why.

Some frequent returners are also frequent purchasers, finds research by J. Andrew Petersen of the University of North Carolina at Chapel Hill and V. Kumar of Georgia State University. The pattern can look like this: A customer buys three sizes or colors, keeps one, and returns the others at no cost. The customer continues to purchase from the site, generating profits that more than make up for returns costs.

Identifying and marketing to those customers pays off. In the academics' study, profits shot up by more than 45 percent per customer, on average, in the six-month window studied, and by 29 percent over three years, when a retailer used the researchers' proposed blend of marketing and liberal returns policies to reach out to customers who return a lot, but buy even more.

Many returns, however, are preventable, caused by shipping errors, poor product descriptions, or manufacturing quality issues.

Preventable returns cost retailers $642.6 billion each year, according to retail analyst firm IHL Group, which finds that:

- 22 percent of preventable returns are due to the differences between how the product looked online and in person.
- 23 percent of preventable returns are due to the retailer shipping the wrong item.

Retailers that collect high-quality data and discover insights about returned products can act quickly to correct problems. For example, after learning that a case of red scarves was placed in a warehouse slot where the green scarves were supposed to go, a retailer can act immediately to stop additional mis-shipments.

To get better data on returns, here are three steps retailers can take:

1. Rewrite reason codes to better reflect the issues customers typically report. One key to better insight is adding a comment box to returns forms so customers can volunteer details beyond the typical reason codes. Also, avoid including a prepaid shipping label and return form in the box as precious time-sensitive data can get lost in back-end reverse logistics processes.

2. Inspect returned products. Examining at least a percentage of products that come back, and noting problems, can help receivers identify otherwise undetected problems. If you manage your own returns, not having a method of data collection at the point of return is a missed opportunity to gain additional data.

3. Apply returns analytics to spot patterns. Real-time processing of returns data can quickly identify negative product patterns and deliver valuable insights into real customer experiences with products. This step requires access to the aforementioned data, along with the technical expertise to set up a system for returns prevention and visibility into the drivers of returns.

Armed with good data, retailers increase the odds of eliminating preventable returns, delighting customers, and keeping them coming back for more. With preventable returns out of the way, retailers can focus on the good kind of returns—the ones that drive larger profits. ■

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Blended Synergy: The Balance of Automation & Expertise

Robotic Process Automation (RPA) is becoming an important innovation across many industries and is beginning to catch the attention of many supply chain professionals. The idea of robots in the workplace might conjure up likeable characters such as Rosie from the Jetsons, Vicky from Small Wonder, or Bender from Futurama. Or maybe you went directly to an image of a doomsday scenario where terminator-like robots take over the world and enslave mankind. Now that I have your imagination running wild, it might be a good time to take a step back and reset.

What is Robotic Process Automation? RPA is a malleable solution that leverages computer software and digital networks to manipulate data, process transactions, and execute defined activities across enterprise systems. See, nothing scary about that. RPA is particularly successful when applied across large labor pools responsible for executing high-volume, transactional functions, but the right solutions can have a positive impact regardless of the size of your labor pool.

RPA will significantly increase productivity by freeing up your most valuable assets to focus on delivering better products and solutions, moving your company forward. Robots don't make mistakes so your company will benefit from 100% accurate data. Data is becoming increasingly valuable and higher quality of work translates to better data, compounding value. Data allows you to make better decisions that impact how you operate, focus capital investments, scope of products and solutions, and position yourself in the marketplace. And, if you manage your customers' data, improved insight and visibility to their organization could lead to higher revenue streams.

RPA solutions differ by company because they reflect the unique demands on your business and how you deliver products and solutions to your customers. These solutions can assume various roles such as automating a highly repetitive task like retrieving documents, sending emails, or executing a definable process. Robots can also augment humans by reducing the time and effort it takes to gather information that requires human intuition and provide single-click execution. They can even assume a less conventional role to help reduce IT costs by assisting with repetitive system configuration, executing test scripts, perform audits or monitor system performance. Your options are limitless.

There are many RPA solutions in the industry and each has specific strengths and weaknesses. Understanding your company's business, technology, security, and financial requirements is critical to your selection process. Once you clear that hurdle, your focus should be on fully understanding how your business operates. At this point, you can't get too far into the weeds.

Understanding and untangling years or decades of business procedures can be complex, but improving a process is not just applying automation. You should challenge why the process is necessary, question how the process is accomplished, and understand who is executing the process. Making sense of your processes will help drive your RPA solution architecture, which will be very different for every company, and forms the foundation for success. Once architectural framework is identified, having the right people and disciplines to design, develop, and support solutions will have the greatest impact on long-term success. The biggest barrier to implementing new technology is overcoming resistance to change. Change is new and new is unknown, and humans don't do well with unknown. Our brains crave predictability, knowns, and constants.

History judges Johannes Gutenberg or Eli Whitney favorably because their disruptive technology changed the status quo in a dramatic way. Scribes were probably not wild about Gutenberg's printing press and laborers adept at picking cotton were not wild about Whitney's cotton gin, but does anyone today think the printing press or the cotton gin was a step back? At the time, those disruptive technologies caused real pain as they reduced the demand for skills in high demand.

Newness eventually becomes normalcy and order is restored. Eventually, robotic automation will be commonplace, and will ultimately assume its place in history when replaced by future technology. Until then, it is our job, our responsibility, to move technology and your company forward.

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Working Alongside Robots: No Longer Science Fiction

Working alongside robots in warehouses is the way of the present, rather than the way of the future. The recent ProMat and Automate conferences, in Chicago, featured robotics and automated materials handling equipment. "Solve for X," the theme of the conference, emphasized the need for manufacturers, warehousing and third-party logistics companies to embrace change to stay relevant.

Rather than focusing on the technological capabilities of these high-efficiency robots, our team attended ProMat & Automate with an eye toward the changing workforce. As we strolled the aisles, observing robots in demonstration booths, we reflected on the results of the 2017 MHI survey. The MHI survey, the fourth in a series of annual industry reports developed in conjunction with Deloitte Consulting, focused on "Next-Generation Supply Chains: Digital, On-Demand and Always-On." The survey received 1,100 responses from manufacturing and supply chain industry leaders.

Approximately 80 percent of respondents to the survey said automation will dominate the logistics industry in the next half decade. Even more relevant, 61 percent of MHI survey respondents indicated that they view robotics and automation of warehouse materials handling equipment as either a disruption or an advantage in the supply chain industry. For comparison's sake, 39 percent of respondents to the 2015 MHI survey reported this view on robotics and automation.

According to the survey respondents and other research, using current logistics methods in urban areas is unsustainable. Sorting robots that use flights and pushers within a small warehouse footprint, such as in a tight-spaced urban setting, will maximize efficiency. Small unit robots in warehouses, like Amazon's Kiva robots, and delivery bot-pods, like Skype founders' new food delivery venture Starship Technologies, will be key to reducing congestion and gaining efficiencies both inside and outside the warehouse.

In addition to well-known retailers like Amazon and Skechers, at Under Armour's manufacturing facility, humans and robots already work alongside one another, to a much greater extent than at most other manufacturing facilities.

Technological disruptions are generally considered positive for industries. However, for those in the materials handling workforce, a robotic disruption could seem threatening. We want to help assuage those concerns about potential diminishing warehouse job openings. Instead, warehouse employees should look forward to easier physical labor, less stress and more intellectual stimulation on the job.

Robots can take the pressure off of warehouses and 3PLs during seasonal surges. Robots can take shifts during the hottest or coldest parts of the day and drastically reduce the amount of walking humans need to do on a daily basis picking orders throughout the warehouse.

A *New York Times Magazine* article published the week of Feb. 23, 2017, emphasized that most robots working alongside humans in warehouses are not eerily human-like, but machine-esque. The reporter implied it is less unsettling to work alongside machines than it would be to work alongside animatronic bots. In this observation, the *Times* addresses and then debunks a common fear: that robots will replace all human workers. Materials handlers should rest assured that there will always be work that needs to be done by humans, namely work that requires observing and anticipating needs in social situations and work that demands emotional intelligence. Customer service situations, like communicating with a major manufacturer about space needs and limitations, inventory shortages or damage, still require abundant human interaction and interference.

Moreover, a *Los Angeles Times* article published Dec. 4, 2016, points out that, while fewer warehousing jobs are being added for materials handling tasks, the new job positions pay more, due to the higher skill set required to monitor automated lift equipment. In the coming years, new automation technology should create approximately 15 million jobs, according to Forrester, a research firm. With these new jobs come important consideration factors. For example, lights-out automation would be much more possible with robots, creating a new set of safety considerations, such as creating adaptive zones, complying with new regulations and providing both bots and humans with clear instructions on how to operate within the designated zones.

Has your organization implemented automated lift technologies yet? How much have you saved in operational efficiencies and utility bills? (Automated lift trucks can work in the dark.) The future is now.

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Planning for the IoT and the Future of Your Supply Chain

The rise of the Internet of Things (IoT) has been noticeable across every aspect of everyday life, from controlling the lights in our homes to tracking the way we shop. It's no surprise that it's also having a huge influence behind the scenes of the supply chain, altering and improving processes from end-to-end to enable retailers to compete within the ever-changing digital landscape.

IoT refers to the internet working of physical devices such as vehicles and buildings, which are embedded with new software and sensors that enable the device to collect and exchange real-time data. This data can then be applied to improve efficiency, make services more personalized, or create new user experiences. When applied to manufacturing and the supply chain, this data can be utilized to bring to life a more streamlined process that runs faster, cheaper, and with fewer mistakes than traditional methods – all of which are vital to keeping up with the increasing customer expectations from e-commerce.

In 2014, there were 1.8 million tracking devices in use on trailers, containers and pallets, allowing organizations to keep track of where their assets were at all times. The benefits of the IoT developments go much further than location tracking though. As it advances, this new technology is being seen as the 5th mobile generation of wireless systems coming into action, beyond the existing 4G signal. This new generation of networks is envisioned to solve the challenge of joining communications and computing together – i.e. entirely for connecting the IoT, leaving 4G focused on 'human' connections. This will allow for complex, real-time feeds of data, such as detailed inventory tracking, which not only allows retailers compete visibility of how much stock is being held and where, but also if it's being held in the right conditions – for example the temperature and humidity of the warehouse at any given moment and receiving alerts if it goes outside of the necessary levels.

Further back in the process, the new technology will also help retailers and businesses to optimize their own supply chain, by monitoring the product lifecycle to incorporate various product performance measurements. Enterprise resource planning (ERP) systems will be able to monitor parts that need replacing, automatically sending an alert before a fault occurs. Similarly, demand forecasting for manufacturers will mean devices that need ongoing support or supplies, for example, printing machines, can effectively monitor themselves, checking levels and automatically placing replacement orders when supplies are low, so there's no need for additional, expensive excess inventory to be ordered and stored, and businesses can stay focused on what they do best. Over time, this will also be able to predict seasonal highs and lows – both for the individual business and the industry as a whole – and pre-empt when demand will be high to alert users and increase stock levels.

For manufacturers and retailers, the IoT will also give previously unimaginable insights into their products when they are actually in use, helping them to refine their offerings, provide predictive maintenance and receive invaluable data on their audiences.

When you look at all of these factors combined, it becomes clear that the Internet of Things is set to change the supply chain in its entirety. By adapting the core dynamics of business processes from marketing to final mile delivery, the IoT will streamline and optimize to never before possible levels, dramatically impacting the supply chain for the better.

Warehouse Management & DC Optimization:

Measuring What Matters

Selecting the best metrics at your company's distribution centers requires the right tools, careful study, and constant collaboration.

By Tom Gresham

Recently, a company that outsources product distribution to Orbit Logistics in Ashland, Va., ran into a problem, but didn't know it. The company sold its products through multiple channels, all pulling from the same inventory housed in one of Orbit's three distribution centers—"effectively cannibalizing their own inventory," says Wendy Hudson, vice president for client solutions for Orbit, which provides e-commerce and retail fulfillment through its three warehouses in Virginia. The company could accept orders on different channels at the same time and surpass the available inventory without realizing it. With insufficient inventory, Orbit, which assembled the products on site, needed to rush to create more. The company did not realize the magnitude of their problem, but fortunately, Orbit did.

"They needed help to see that they had to have their inventory in place before committing to an order, so they wouldn't come up short and potentially run into penalties," Hudson says. "They also had to realize they incurred real cost when we had to remake products for them."

Orbit used measurable data to convince the client how important it was to address the issue. For another client, Orbit used metrics to demonstrate the steep costs they accrued for absorbing an unusually high number of returns. The news was revelatory for the company, which had assumed the impact was minimal. "With quantifiable data, you can identify issues and work on viable solutions," Hudson says.

In today's complex distribution center environment, the right data can mean everything. The rise of e-commerce and the need for fulfillment centers that can warehouse a large variety of products and ship them quickly to customers on demand has dramatically altered the landscape. The heightened emphasis on speed and a diversity of products can put a strain on a distribution center while demanding innovative and ambitious steps to keep up.

"Many companies today are faced with the challenge of how to position inventory to make it readily accessible to a large percentage of customers with varying delivery demands—all without unnecessarily driving up costs by holding too much inventory or spreading it too thin," says Jose V. Gonzalez, head of CLS product management, North America for APL Logistics, a Scottsdale, Ariz.-based company that provides supply chain services worldwide.

Photo courtesy of Mobile Media

Technological tools designed to work in rugged conditions allow for real-time data management of inventory in the distribution center.

"These challenges are having a profound impact on the number and types of distribution centers being built—and increasing demand for larger facilities that allow room for the labor-intensive operations and greater number of workers that e-commerce requires," he adds. "They also are driving the more rapid introduction of technology solutions into warehousing operations."

Distribution center performance has become more important than ever for retailers. If customers expect to order any item they desire, anywhere at any time—and then receive it quickly—the work at the DC plays a critical role in making that expectation a reality.

For that reason, measuring the work done at distribution centers also takes on a particular prominence. Both the retailers that use distribution centers and the logistics professionals who manage them need accurate, readily available data that provides a clear picture of how successfully they are performing their mission.

▯▯▯▯▯▯ Data, Data, Data

The rise of increasingly sophisticated technology and the abundance of data those advances make available have opened doors to a granular study of performance that would have been impossible until recently.

"Few logistics professionals will claim that new technology isn't a critical part of increasing distribution center efficiency," Gonzalez says. "In most cases, the more information you're able to collect, transfer, and leverage, the more successful your operation will be."

Not too long ago, Orbit relied on a paper-based picking system with manual inventory entry. That slowed data collection. Today, Orbit uses a digital system with assigned barcodes and license plates.

"The system lets us check things much faster and more accurately," Hudson says. "Data can be available on demand. Even one year ago, our customers didn't have that on-demand expectation. They were fine if their inventory was batched at the end of the day or the end of the week. Today, they want to know what inventory they have right now. Technology has increased their expectation for data availability."

The migration to digital remains an ongoing process in the distribution center sphere, says Matt Miller, CEO of MobileDemand, a Hiawatha, Ill.-based maker of rugged tablet PC systems for business and enterprise operations. He estimates between 10 and 20 percent of MobileDemand's new rugged tablet customers have been using pencil and paper tactics for inventory—companies

that are automated on the back end but not on the front.

The effect of making the transition from a paper-based process can be dramatic. For instance, Rimports, a Provo, Utah-based producer of scented wax, wax warmers, and essential oils and diffusers, was using clipboards and handheld scanners to track inventory in the warehouse. The system's inconvenience led employees to scan as few labels as possible, hindering inventory tracking and movement.

MobileDemand worked with Rimports to deploy a Microsoft Surface Pro 4 in a MobileDemand rugged case, mounted on a forklift. The upgrade improved and quickened data capture, allowing for better measurements.

MobileDemand is unusual in that it offers inexpensive rugged tablets, allowing smaller operations to automate data collection. "Technology advances and the consumerization of devices are driving down hardware costs," Miller says.

Despite the vast new wealth of data, one of the biggest mistakes companies make is measuring and monitoring too many attributes at once. When APL introduced labor management systems

To better manage inventory of its fragrance products, Rimports deployed a Microsoft Surface Pro 4 wrapped in a MobileDemand rugged case and mounted it in a forklift. The system empowers DC workers to capture all necessary data quickly and accurately.

into its distribution centers, it monitored 44 measurements on its facility scorecard. When it found itself overextended, APL eventually cut back to 28 measurements.

"Ultimately, there's only so much time in a day—and only so much energy companies can devote to evaluating and analyzing performance," Gonzalez says. "Even though it's tempting to measure every aspect of a facility's performance, it's important to remember that trying to measure an overly large number of criteria only results in creating more work for people. And it makes it difficult for those who are reviewing the information to focus on what's important."

Finding Your KPIs

The measurements Orbit's customers most closely monitor can vary, Hudson notes, but some overarching points of emphasis typically apply. In all cases, a clear view of inventory status is crucial. In most, so is speed and accuracy.

"Companies are usually focused on trying to get the most volume in and out of the business with the fewest errors possible," Hudson says. "How fast can inventory move and how accurately? Both of those questions are directly related to how profitable you will be."

APL Logistics developed a scorecard for its facilities with key performance indicators (KPIs) that include cycle time, employee turnover rate, on-time inbound deliveries, inventory accuracy, and on-time shipping, among others. Similarly, DHL Supply Chain, which provides customized supply chain solutions across industry sectors, looks at numerous operating KPIs for insight into operational performance, says Will Heywood, the company's vice president for regional resource planning and management and operations development.

Photo courtesy of DHL Supply Chain

The design of a distribution center is critical to maintaining a lean operation and capturing relevant KPIs. Data can help guide the development of an optimum layout for workers to navigate.

The rise of e-commerce is building demand for larger distribution centers that can sustain complex, labor-intensive operations.

"At the headline level, we focus on a few numbers that together provide a reliable view to how well a site is performing," he says. "These measurements include direct vs. indirect labor hours, labor cost per unit, inventory location accuracy, safety, associate turnover, and overtime."

No matter which KPIs a logistics provider uses, the companies that employ them will also target their own. Often, those areas of focus overlap with those that other companies emphasize, but some vary sharply. For example, speed may not be a chief concern for some companies.

"For some companies, the data captured is more important," Hudson says. "For instance, if they're tracking products for warranty information, they want to capture the serial number. They might need to gather a lot more information in receiving and it's worth it for them to focus on being more accurate and ready for outbound use. It depends on each market."

Nicole DeHoratius, adjunct professor of operations management at the University of Chicago's Booth School of Business, says her research with collaborators identified two key areas in distribution centers that people believe are important but not adequately measured: consistency—the ability to fulfill orders repeatedly on time and in full, and recovery—the ability to bounce back after a service disruption.

Retailers can improve profitability by determining orders via consistency and recovery measurements rather than "common metrics such as in-stock," argue DeHoratius and her fellow researchers.

"People talk about consistency and recovery but haven't found good ways to measure them," she says. "We argue that consistency and recovery should be included on scorecards. Both measurements clearly matter to supply chain performance, but they have been overlooked because they are hard to measure."

⌁⌁⌁⌁⌁⌁ Seeking a Collaborative Approach

Key components of any relationship between a supplier and a distribution center operation are open communication and a collaborative approach. Companies should take ownership of the measurement being done in the distribution centers that manage their products and ensure that their logistics providers are collecting the most useful data possible.

Orbit, for example, works with its clients to target the measurements that fit them best. "Each customer may have either conflicting or complementary KPIs," Hudson says. "One may want more data collected or more sorting in the receiving area than others. It's about finding a balance between overall KPI and individual customer preferences."

New technology makes it much easier for companies to develop a partnership with those that are managing their inventory in distribution centers—and vice versa.

"Service providers need to create transparency and visibility for customers," Hudson says. "We have customers who have never set foot in the warehouse. Technology has allowed us to create a connection with them so they see us as a key part of their business structure."

APL aims for frequent communications with clients via the channels and methods they prefer, which could be regular reports, routine scheduled meetings, or even an on-site client representative. The key is for companies to understand they have the wherewithal to play a part in the process—they should not simply cede decision-making about measurement to their logistics providers.

"To make a 3PL operation all that it can be, a company must be clear about what it expects from its provider and that location down to the nth degree—and, if it doesn't, it's the provider's job to extract that specificity," Gonzalez says. "Ideally, the parties should discuss these expectations upfront and prior to signing a contract because that's the best time to align goals. But it's never too late for a company to spell out what it wants and how it wants it."

Strong DC collaborations remain

the exception rather than the rule. DeHoratius was part of a research team that studied fulfillment errors at a major retailer's DC. The research found that the majority of fulfillment errors were due to documentation, barcoding, and retail ticketing mistakes. Some errors originated with suppliers, who then frequently received financial penalties in the form of chargeback deductions, which cut into their revenue.

"Better collaboration among supply chain partners, including buyers, vendors, and warehouse operators, could have limited those errors," DeHoratius says. Ultimately, the study notes, "fulfillment errors reduce the efficiency of the supply chain as a whole and impair implementation of modern retail tools and techniques like automation, pack-by-store, and omni-channel."

To solve persistent fulfillment errors, it is important to take a total cost perspective and consider all the different ways inefficiencies can arise.

"Supply chain partners who focus on collaboration also tend to look at the total cost of the supply chain," DeHoratius says. "They don't look just at the price to acquire or deliver a product, but at the total cost to deliver a product from end to end. This perspective is rare, but much needed."

Getting it Right

In the supply chain, data integrity issues and fulfillment errors can lead to inventory management problems and, consequently, reduced demand.

"One distribution center challenge is that there's often a discrepancy between the inventory on the shelf and the inventory recorded in the system," DeHoratius says. As a result, some critical questions loom: Do the companies know how big that discrepancy is? Do they have methods in place to fix those discrepancies? How can they prevent them?

DeHoratius and her team conducted an experiment in a virtual lab mimicking the experience of pickers. In one scenario, pickers chose between two products with easily distinctive packaging. In a second scenario, the packaging was similar. Researchers observed a productivity loss of approximately 23 percent in the case without distinctive packaging.

Technology can help reduce picking errors, for example by providing pickers with detailed images of the products they are selecting. Alternatively, companies can be more thoughtful about offering pickers visual cues through packaging that differentiates one item from another.

"Most distribution centers , however, still have legacy systems in place that don't help pickers identify when they make a mistake at the point of occurrence," DeHoratius notes.

An Ongoing Experiment

It is easy to fall into the trap of thinking that you are measuring what you need to measure, especially if that data provides you with good news.

However, it is important to test your KPIs—not only the basic measurements, but also the methods behind those measurements.

"There are a lot of ways to prove you're right and a lot of ways to prove you're wrong," says Hudson.

Companies that challenge their assumptions and continuously search for the best way to measure performance will gain an advantage. It is rarely as simple as identifying a measurement and sticking with it.

"There are many different ways to measure KPIs, and you tend to have to try them on for a while," Hudson says. "Look at the KPIs that you are using and ask: Do they drive the right behaviors in my workforce and my bottom line? If they don't, then it might be time to try some different ones. The measurement process should constantly evolve." ■

Technology Measures Up

Technology has made increasing inroads in the distribution center realm, leading to major changes in the way they operate.

Most technology applications for the distribution center focus on improving overall productivity in operations, increasing throughput while holding or reducing labor, according to Will Heywood, vice president for regional resource planning and management and operations development at DHL Supply Chain.

"Operating platforms such as warehouse, transportation, and labor management systems that allow managers to more effectively allocate resources in buildings and networks are having a big impact, and there is much more upside to harvest with these tools," Heywood says. "More recently, we have seen positive impacts from voice and vision picking, and significant reductions in the cost of certain automation equipment has made ROI considerations much more compelling."

Introducing technological solutions into a distribution center involves care and awareness of the worker experience.

"The technology has to be user-friendly and ready to handle all the conditions and anomalies of the workplace," says Matt Miller, CEO of MobileMedia. "It has to be fast and has to be a solution the user wants to use. It can't get users frustrated."

Despite all the advances technology allows, it is important to keep the allure of new technology from obscuring basic truths about DC operations.

"Many of today's best practices are also many of yesterday's best practices, because no matter how much the industry and world evolve, some things—like the fundamentals of excellent DC operations—remain the same," says Jose Gonzalez, head of CLS product management, North America for APL Logistics. "It's still essential for a DC to be able to receive, store, and process goods safely, efficiently, quickly, and accurately and to help support and enable all the other activities that take place within a supply chain."

Got 3PL challenges? Get **free** **expert** **solutions** at inboundlogistics.com/3pl

TMS Solutions:
The Big Picture

Transportation management systems streamline the information exchange between shippers and carriers, so freight moves reliably, efficiently, and at the best possible cost.

By Karen Kroll

When Martin Rothe joined Progressive Converting (Pro-Con) three years ago as vice president of supply chain, the company managed 15,000-plus annual shipments using spreadsheets and email. "It was clear we needed to implement a transportation management system (TMS) or we'd lose control," he says.

Pro-Con, based in Appleton, Wis., converts paper stock to the rolls and sheets commercial printers require. It also delivers paper to printers, many of whom expect next- or second-day delivery. "That part of the business has continued to grow more demanding over the past 15 years," Rothe says.

Rothe researched about 40 TMS solutions with several goals in mind. "We didn't want to give away control of our supply chain," he says. Instead, he wanted a way to better manage the transportation activity in-house, given how critical it is to Pro-Con's customers.

Cost also was a concern. "Even though we're a healthy mid-sized company, we didn't have the budget for a traditional TMS installation," Rothe says.

Rothe decided on a transportation management solution from U Route, a Warren, Mich.-based shipper software vendor, attracted in part by its web-based connectivity and API (application programming interfaces) connections to carriers. "With the TMS, I'm now out of the business of uploading rates and tariffs," he says. Instead, carriers handle that function.

Pro-Con rolled out the solution at each of its five facilities, one at a time. While reengineering processes required several months, the software installation took just a few days.

Since then, Pro-Con employees have cut in half the time they spend tracking and monitoring shipments. The visibility the system offers allows Pro-Con to save money by consolidating shipments. The company's cost per shipment remains below what it was in 2013, when Rothe joined the firm. "The savings on freight expenditures has been substantial," he notes. That's key, given that annual shipments now top 22,000.

By implementing Transplace's proprietary TMS, building products manufacturer USG Corporation optimized its transportation network, and can now view shipments in real time and reduce freight costs.

Like Pro-Con, a growing number of mid-sized and even small companies can leverage transportation management systems that previously were out of reach for all but the largest enterprises.

"The big change has been in the architecture," says Chris Caplice, executive director of the MIT Center for Transportation & Logistics in Cambridge, Mass. Early TMS solutions, which came on the scene in the late 1980s, were "mainframe AS400s, with green screens," he says.

Client/server models came next. A central server connected to multiple PCs allowed more than one person to work off the same rate base.

Ahead in the Cloud

Then, "cloud technology changed everything," Caplice says. The cloud speeds implementation, eliminates hardware compatibility challenges, and allows for easier communication among carriers and trading partners.

Most important, cloud technology prompted dramatic drops in the cost of many TMS solutions. Shippers no longer have to invest in software licenses and hardware, nor mammoth installation projects. "The cloud has made TMS accessible to a wider swath of companies," says Jordan Kass, president of TMC, a division of third-party logistics provider C.H. Robinson, based in Eden Prairie, Minn.

Cloud systems also do more: They not only automate shipment planning and execution, but sophisticated algorithms also allow them to optimize shipments across modes and routes. "The logistics network becomes a fine-tuned engine," says Frank McGuigan, president and chief operating officer for Transplace, a Frisco, Texas-based logistics solutions provider.

Craig Boroughf, senior director of global sourcing for building products manufacturer USG Corporation, based in Chicago, has experience with the TMS evolution. USG has used a Transplace TMS since 2001 to help manage daily shipments from 45 manufacturing facilities.

In 2001, USG's goal was to automate carrier assignments and manage shipment costs, Boroughf says. Transplace's optimal carrier assignment (OCA) software compares all shipments against the entire carrier pool. "Given the size of our plant locations and the volume of daily shipments, we saw the software as a real opportunity to optimize those load assignments," Boroughf says.

Another focus has been automation and efficiency. Software has reduced the time spent on transactional tasks such as email and status updates, Boroughf says, enabling employees to spend more time with customers.

USG is now leveraging the TMS to improve service even more. One

example: Linking the software with GPS to pinpoint shipment locations. The goal is to "proactively use that information to resolve service issues before the customer is even impacted," Boroughf says.

As the software evolves, it allows Boroughf to manage a larger customer base with the same number of staff. He notes that housing starts—a key measure of the market for USG's products—nearly doubled between 2010 and 2017, rising from 580,000 to about 1.2 million. "The TMS allows USG to meet the growing demands of the industry," he says.

Along with a wider range of prices for transportation management systems, the term itself has broadened to encompass an expanding universe of solutions.

For example, Freightview, also a division of C.H. Robinson, provides "a tool that allows shippers to automate communication with carriers, rather than rely on email and phone calls," explains Megan Orth, director of Freightview.

Freightview is geared to small or mid-sized companies that ship daily. They can purchase a flat, monthly subscription and then connect with their carriers through API technology. The software focuses on less-than-truckload (LTL) shipments; a module for truckload shipments is in beta testing.

Immediate Benefits

One Freightview user is Wallprotex, a St. Charles, Ill.-based provider of sustainable, quality wall protection products. The company had been working with a broker to identify carriers to move its LTL shipments. "We had no visibility, and just a small list of carriers," recalls Keith Cocking, customer service manager.

As the company grew, Wallprotex struggled to provide timely responses to customer inquiries because it had no shipment visibility. "The lack of visibility was a challenge because we try to be competitive, and open and transparent with customers," Cocking says.

Before he could implement the Freightview system, Cocking needed to establish direct rates with carriers. That process took several months,

after which Wallprotex initiated a trial with Freightview.

The benefits were immediate. First, obtaining shipping quotes, which used to take up to 30 minutes, dropped to about one minute. Wallprotex also saves about $40 per shipment.

Second, the ability to more quickly respond to customer requests provides a competitive edge. Wallprotex recently began working with a customer that switched from a competitor and wanted to arrange same-day shipments. "In two minutes, we had all the rates," Cocking says. "We set up guaranteed shipments while still on the phone with the customer"—an impossibility before implementing the software.

Large Companies in the Mix

While TMS solutions now are available to many smaller companies, they still have much to offer larger operations. The requirements tend to expand. For instance, multinational firms often require transportation solutions that handle all modes in all regions of the world.

The sophistication of the algorithm that assigns shipments to different carriers is key. It should be able to handle multiple facilities and users, and consider all transportation components—such as cost and time constraints, and equipment type—to identify carriers that are the best match. "The optimization algorithm is the TMS," says Mitch Weseley, founder and chief executive officer of 3Gtms, a transportation management solutions provider based in Shelton, Conn.

Optimizing transportation might mean comparing LTL to truckload shipments to see which is less expensive. If the shipment must travel via a particular mode, the software should minimize the distance traveled or the number of vehicles used. Or, it might need to identify the least expensive transportation mode that will keep products at a specific temperature.

Moreover, the algorithm should calculate on the fly. Say a shipper is ready to move five LTL shipments, each a different product, from Atlanta to New York. Then a customer requests

Holman Parts Distribution leverages Kuebix's cloud-based TMS to gain control of freight spend, obtain the best price at the best value from carriers, and track all shipments from a single site.

200 more units of one product. The additional units won't fit on trucks already assembled.

The software should help the shipper decide how to accommodate the request. Should they consolidate some shipments? Which group of products should they remove to accommodate the new one?

"There are countless possibilities," Weseley says. The TMS should work within this "crazy dynamic world" to identify the best solutions.

In and Out

While transportation management systems tend to be used for outbound shipments, they can provide savings on inbound ones as well. A TMS can provide better control and visibility of inbound and outbound shipments, says Rick LaGore, chief executive officer of InTek Freight & Logistics, an Indianapolis-based transportation solutions provider.

Indeed, the savings on inbound shipments can be larger than those on outbound. Historically, suppliers—not customers—have established relationships with carriers, Kass notes. As a result, client companies often have little visibility to cost-savings opportunities. For instance, the company could be using suppliers located within one region that all ship less-than-truckload. A TMS can identify opportunities to

consolidate shipments to reduce costs and cycle time.

This often requires reengineering processes. While the supply chain or warehouse team usually controls outbound shipments, purchasing typically controls inbound shipments, LaGore notes. For simplicity, many products arrive with freight already rolled into their costs. Changing this process will alter buying habits and negotiations with suppliers.

A TMS also can impact relationships between shippers and their brokers and/or carriers. Many carriers initially were nervous when Pro-Con implemented a TMS, Rothe notes. They anticipated a reverse auction that rewarded companies on price alone. "But that's not how we do business," he says. "We don't treat carriers as just numbers on a page."

Carriers typically come to see Freightview as a better way to communicate with their shippers, Orth notes. Moreover, the service component always comes into play. "If a carrier is the cheapest, but it delivers shipments to customers late or damaged, shippers are unlikely to remain with them," she adds.

That said, the expanding reach of TMS is changing some roles. Brokers, for instance, may need to find new ways to provide value, given that technology has streamlined the job of connecting shippers and carriers, notes Jonathan Sturtz, founder of U Route.

Given the range of available TMS solutions, how can you decide which is right for your firm?

A solid starting point is doing a "deep dive on your internal requirements," Kass recommends. Is geographic scope critical? The ability to work with multiple transportation modes? The answers should guide your decision.

Independence is another consideration. A TMS that works only with a specific carrier or set of carriers may limit opportunities to save.

"Look for a system that's easy to use, but handles the complexity of transportation management," suggests Monica Wooden, chief executive officer of MercuryGate International, a TMS provider based in Cary, N.C.

For instance, the solution should be able to handle all shipment modes the organization currently uses or expects to use within a single system. That way, it can consolidate shipments from different legs and remove empty miles from the supply chain. Including parcel is key, Wooden adds, given how big a transportation component it has become.

Many shippers retain multiple ERP systems because the cost of consolidating to a single one is daunting. That means their TMS solution needs to support all these systems.

Cost and contract terms also are key. Consider the experience of John Conte, logistics manager for Holman Parts Distribution in Pennsauken, N.J., a division of Holman Enterprises and a nationwide, single-source supplier of original equipment powertrain products with annual shipments topping 10,000. When Conte began looking for a TMS, he focused on solutions that were cloud based, easy to use, and could be adopted across the organization.

Conte didn't want to sign a multi-year contract, or be charged for each transaction on top of monthly or annual fees. "If a provider wants to charge to print a bill of lading every time you make a shipment, those transactions will eat up the freight savings," he says.

Conte selected a cloud-based TMS from Maynard, Mass.-based Kuebix that fit his requirements. The system has cut the time required to process a freight shipment from eight minutes to two, and offers "total visibility," Conte says, noting that he's responsible for operations at 11 locations.

The Kuebix TMS also cut freight costs by about 15 percent without changing carriers. "The system allows us to look at all our carriers, shipment by shipment," Conte says. "Depending on a shipment's origin and destination, the system identifies the most cost-efficient carrier."

Anticipating the Future

Advancing technology will continue to impact the TMS market. The next several years should bring greater deployment of the Internet of Things, predictive analytics, and mobility. These advances will create "an environment in which technology allows us to automate processes, proactively flag supply chain disruptions, and better track and trace shipments," Kass says.

Jeremy Bodenhamer, co-founder and CEO of ShipHawk, a shipping platform provider based in Santa Barbara, Calif., predicts TMS solutions increasingly will take the form of individual systems pieced together with APIs, as opposed to a single platform that tries to be everything to everyone.

No matter how they evolve, the value of transportation management systems likely will increase over the next decade, allowing shippers to efficiently manage carriers, make optimal transportation decisions, and cut costs. ■

TMS Return on Investment Drives Market Growth

Decreases freight costs > 12%	34.4%
Decreases freight costs by 9-11%	12.5%
Decreases freight costs by 6-8%	15.6%
Decreases freight costs by 3-5%	21.9%
Decreases freight costs < 3%	0%
No difference	15.6%

The measurable ROI on TMS is a driving force behind the growth in the market, according to an ARC survey. Compared to a similar survey five years ago, results indicate that ROI has improved greatly. In the original survey, 23 percent of respondents indicated a more than 10-percent decrease in freight costs. Even after scaling the top segment to freight savings of more than 12 percent, nearly 35 percent of respondents in 2016 indicate the top level of savings. Giving these respondents a weighted average, the ROI on TMS has improved from 6.8 percent to 8.5 percent.

Source: ARC Brief, Feb. 2017

TMS Implementation Timelines

Project timelines were met and the software was fully functional at go-live **27.3%** ■

Project timelines slipped, but following go-live, the TMS was fully functional **24.2%** ■

Project timelines were met for the bulk of features, but not all promised functionality **39.4%** ■

Project timelines slipped and the software was not fully functional **9.1%** ■

The TMS implementation timeframe needs ROI improvement, reports a recent ARC survey. The good news is that only 9 percent of respondents to ARC's study indicate that TMS implementation project timelines slipped and the software was not fully functional at deadline.

Additionally, 39 percent indicate that timelines were met for the bulk of features, but not all promised functionality, and 24 percent say timelines slipped but following go-live, the TMS was fully functional. That leaves only 27 percent of respondents who indicate timelines were met and the software was fully functional at go-live.

This is an area that can make or break IT budgets, and gets shippers thinking about alternative routes.

Source: ARC Brief, Feb. 2017
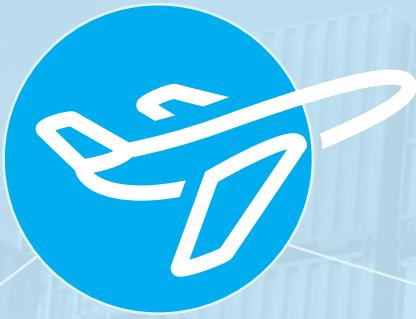
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Looking to move freight more reliably, efficiently, and cost effectively? Implementing a transportation management system (TMS) might be the answer. Today's TMS solutions—whether purchased directly from a provider or offered through your third-party logistics partner—enable strategic and operational planning, network design, execution and monitoring, invoicing, billing, settlement, and more. *Inbound Logistics'* TMS Buyer's Guide highlights leading TMS providers, 3PLs, and systems that can optimize your transportation operations, resulting in improved customer service, warehouse efficiency, inventory reductions, and more.

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VENDOR	WEBSITE	PRODUCT	PLATFORM LICENSED TO USER (INSTALLED LOCALLY)	HOSTED ON VENDOR WEBSITE	CLOUD BASED	PRODUCT DESCRIPTION
360data	www.360data.com	360data TMS			●	Low-priced SaaS TMS geared primarily for brokers and shippers. Customizable screens to fit each user's specific needs.
3Gtms	www.3gtms.com	3G-TM	●	●	●	Includes all transportation functions from the time the order was created in the ERP through to delivery and financial settlement.
4flow	www.4flow.com	4flow vista	●	●	●	Integrates supply chain optimization and transportation management—from strategic design to tactical planning and daily execution, including claims. Offers individual shipment and route optimization.
Acuitive Solutions	www.acuitivesolutions.com	Acuitive Global TMS			●	Cloud-based TMS that enables companies to rate, route, and audit air and ocean shipments faster, with fewer people.
Agile Network	www.agile-network.com	Transportation Management Software			●	Enables rate shopping and carrier selection; automates address validation; ensures export compliance; offers pack verification; supports shipment execution and labeling.
Agistix	www.agistix.com	Agistix			●	Global supply chain visibility and execution platform allowing users to centrally manage inbound, outbound and third-party shipments across all modes, carriers, and services.
ALC Logistics	www.alclogistics.com	Custom TMS		●	●	Fully customizable TMS streamlines transportation and adds visibility. Modules include load tendering, dock scheduling, spot bidding, claims, and freight payment.
Aljex Software	www.aljex.com	TMS		●	●	Automates shipment execution with least-cost routing, EDI, document imaging, integrated emailing and faxing, and burst communication. Shippers can view reports on carrier transit time and terminal data.
Amber Road	www.amberroad.com	Transportation Management	●		●	Easily evaluate different freight options on international moves; calculate accurate total landed cost; perform freight audit; identify discrepancies; perform performance management analytics and reports.
AndSoft	www.andsoft.com	e-TMS	●	●	●	Supports high data volumes, customizations, and changes in real time. Web-based solution for FTL, LTL, and small package deliveries.

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			LICENSED TO USER (INSTALLED LOCALLY)	HOSTED ON VENDOR WEBSITE	CLOUD BASED	
APL Logistics	www.apllogistics.com	ShipMax		●		Streamlines collaborative shipping and increases transport efficiency. Pairs freight with compatible partners, shipping to common customers and destinations, for improved load utilization and delivery optimization.
AR Traffic Consultants	www.artraffic.com	CalcRate	●	●	●	Rating, routing, domestic and international documentation for parcel, LTL, and truckload shipments. Powerful analytics provide actionable information to understand and control freight costs.
BlueGrace Logistics	www.mybluegrace.com	BlueShip			●	Manages the entire supply chain. Free for customers, it is a single source for quoting, tracking, and invoicing shipments.
BluJay Solutions	www.blujaysolutions.com	Transportation GTN		●	●	Offers one platform and a single workflow for planning, execution, and analytics for benchmarking, plus connectivity to a global trade network.
Cardinal Hosted Logistics	cardinalhostedlogistics.com	Cardinal Hosted Logistics	●	●	●	Offers customized technology solutions at a fractional cost and without the infrastructure and personnel typically required to develop the same solutions in-house.
CargoSmart Limited	www.cargosmart.com	CargoSmart Transportation Management		●	●	Provides shipment management solutions that benchmark ocean carrier sailing schedules, performance, and contracts. Leverages big data and IoT for greater visibility and live exception management.
Carrier Logistics	www.carrierlogistics.com	FACTS Transportation Management	●	●	●	Provides integrated freight management solutions that help improve profitability.
CDM Software Solutions	www.cargointelligence.com	CDM Cargo Intelligence			●	Intelligent tracking solution that utilizes data capture mechanisms from all tracking sources including GPS, RTLS, IoT, RFID, barcode and e-commerce EDI/XML in one unified portal.
Cerasis	www.cerasis.com	Cerasis Rater			●	Web-based, multi-site supported TMS for over-the-road transport management. Reports, invoice history, carrier records, bills of lading creation, auto-pick up features, invoice auditing.
Cheetah Software Systems	www.cheetah.com	Cheetah LOOP Platform		●	●	Plans, dynamically manages, adapts and optimizes fleets and drivers, resulting in companies using fewer trucks, driving fewer miles, and making more on-time deliveries.

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			LICENSED TO USER (INSTALLED LOCALLY)	HOSTED ON VENDOR WEBSITE	CLOUD BASED	
ClearTrack	www.cleartrack.com	Load Tender X-change		●	●	Cloud-delivered load bid and tender; price and terms negotiation; supports public and private carrier networks; shipment status and visibility; monitor and analyze carrier performance.
ClearView Audit	www.clearviewtms.com	ClearView TMS	●	●	●	High-volume execution platform that processes shipments in real time across all transportation modes with full status visibility.
Cloud Logistics	www.gocloudlogistics.com	Cloud Logistics TMS			●	Allows shippers and 3PLs to create, rate, consolidate and tender loads. RFQ support for spot market. Match pay for carrier invoices. Five to six upgrades per year.
Coyote Logistics	www.coyote.com	Collaborative Transportation Management		●	●	Solutions include network engineering, data consulting, order management and consolidation, mode and route optimization, bid management and analysis, training, reporting dashboards, and project management.
CT Logistics	www.ctlogistics.com	FreitRater & FreitLion	●	●	●	Cloud, hosted or licensed global supply chain management, cost reduction and TMS solutions with comprehensive visibility. Solutions include: TranSaver, FreitRater, Lion, and FreitLion.
CTSI-Global	www.ctsi-global.com	CTSI-Global TMS		●	●	Empowers domestic and global shippers and 3PLs to manage orders, optimize loads, select carriers, tender shipments, manifest parcels, track deliveries, and manage claims.
Descartes Systems Group	www.descartes.com	Descartes Transportation Management	●	●	●	Helps logistics managers, shippers and third parties evaluate transportation alternatives simultaneously to find efficient shipping methods. Manages contract carriers from shipment planning through execution and settlement.
DHL Supply Chain	www.dhl-usa.com/supplychain	Transportation Management System	●		●	Offers highly specialized transportation solutions, including dedicated fleet, managed transportation and freight brokerage, along with warehousing, value-added services and international air and ocean freight.
Echo Global Logistics	www.echo.com	Echo TMS	●	●	●	Simplifies transportation lifecycle. Automates order management and consolidation, mode/route optimization, shipment tender and tracking, exception management, and invoice audit/settlement.
Efreightsolutions	www.efreightsolutions.com	EFS TMS			●	Easy to use solution that connect shippers and carriers through automation.

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			LICENSED TO USER (INSTALLED LOCALLY)	HOSTED ON VENDOR WEBSITE	CLOUD BASED	
Elemica	www.elemica.com	Elemica Logistics Solutions			●	Connects to LSP providing end-to-end supply chain visibility. Provides transport execution, optimization, slot booking, carrier rate sourcing, and freight invoice audit and management.
Eyefreight	www.eyefreight.com	Eyefreight SaaS TMS	●		●	Provides a single platform for central coordination and detailed data visibility over complex transportation operations to reduce costs, increase service levels, and ensure sustainability.
Fortigo	www.fortigo.com	TMS Software			●	Automates, optimizes, and audits logistics processes across the supply chain. Provides one system of record for logistics across multiple sites; interfaces with supply chain solutions.
Freightgate	www.freightgate.com	Freightgate Logistics Cloud	●	●	●	Manages all transport modes, dynamic 5-leg rating and routing, end-to-end visibility, procurement, invoice validation, what-if scenario analysis, PO and packing lists.
Freightos	www.freightos.com	Freightos			●	Enables advanced management of ocean, air and trucking rates, instant international pricing/routing generation and live comparision and booking from industry freight rates.
Freightview	www.freightview.com	Freightview		●	●	Helps small and midsized businesses streamline quoting, booking, tracking and reporting for freight shipments. Supports multiple users and API access.
Gelnius	www.gelnius.com	TMS		●	●	Global, multi-lingual, multi-modal, multi-regional, multi-currency TMS. Automates documentation, connects via web services to carriers, and consolidates via merge-in-transit features globally.
GTG Technology Group	gtgtechnologygroup.com	Transportation Management & TabNet Technology			●	Manages global transportation management systems for intermodal, brokerage, and drayage transportation companies of all sizes. All-inclusive software including EDI, document imaging, and integrated accounting.
Haven	www.haveninc.com	Haven TMS			●	Singular shipping: one full-featured platform, from booking and tracking to data analysis and payment, that allows global shipping teams to work smarter and reduce costs.
HighJump	www.mile.com	Prophesy DispatchSeries Software	●		●	Dispatches trucks, manages carriers or drivers, handles IFTA and DOT compliance, tenders loads, handles commissions and billing—from one trucking software solution.

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Highway 905	www.highway905.com	TMS	●	●	●	Simplifies carrier selection with smart insights. Reduces overall costs with optimized load scheduling and accurate freight billing. Enhances efficiency with multi-modal carrier integration, signed POD capture.
InMotion Global	www.thefreeTMS.com	AscendTMS	●	●	●	100% free for the basic system, no annual license cost, no downloads or installations. Mobile certified. Provides full enterprise level TMS features to manage and operate any logistics operation.
Intellitrans	www.intellitrans.com	GVP		●	●	Provides complete operational, visibility, and analytical capability, and integrates with TransCore's fixed and handheld readers.
J.B. Hunt Transport	www.jbhunt.com	J.B. Hunt 360		●	●	Automates and optimizes multi-mode shipments. Features include real-time rate quotes, routing guide, automated carrier selection, automated tendering, mode/route optimization, load consolidation, and freight payment.
JDA Software	www.jda.com	Transportation Management	●	●	●	Helps infuse value and visibility into transportation and logistics networks by facilitating an end-to-end intercontinental planning process to manage transportation lanes for intercontinental moves.
Kuebix	www.kuebix.com	Kuebix TMS		●	●	SaaS logistics solution for simple to complex supply chains. Configure with premier apps and integrations. Provides complete visibility, fuels collaboration, and turns analytics into results.
Logility	www.logility.com	Logility Voyager Solutions	●		●	Automates multi-modal shipment planning, execution, and freight accounting. Supports automated, unattended operation by monitoring activities with real-time alerts. Analyzes productivity using KPIs to deliver reports.
Logistix Solutions	www.logistixsolutions.com	Logix Software	●			Transportation optimization and distribution network modeling/design. Routing and scheduling, private fleet, LTL and truckload shipment optimization for small and mid-sized shippers.
Manhattan Associates	www.manh.com	Transportation Management	●	●	●	Holistic suite of unified logistics software that simplifies, optimizes and reduces costs for managing complex transportation networks.
MatchBack Systems	matchbacksystems.com	SaaS for Global Transportation			●	Provides configurable SaaS solutions, which use proprietary algorithms and predictive big data analytics to identify optimal matchbacks (street turns) for inland container moves.

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MercuryGate International	www.mercurygate.com	TMS	●	●	●	Provides TMS solutions for shippers, carriers, private fleets, 3PLs, freight forwarders and brokers. Solutions begin with procurement and go through invoice settlement and review.
Next Generation Logistics	www.nextgeneration.com	FreightMaster TMS	●	●	●	Easy to use TMS platform connects shippers with their carriers to rate shop, tender, optimize, and track load status.
Nulogx	www.nulogx.com	TMS Online	●	●	●	Hosted solution that supports all activities necessary to manage and execute the full lifecycle of the transportation process.
Odyssey Logistics & Technology	www.gowithwin.com	WIN (Web Integrated Network)			●	No-cost, no-fee, browser-based technology lets shippers transact with existing carriers and brokers plus access new ones, while simplifying processes, increasing visibility, and offering savings.
Omnitracs	www.omnitracs.com	Omnitracs Transportation Management System			●	Automates operations, provides robust data management and reporting, improves customer service, integrates flexibly with existing technology platforms, provides trip management and real-time event notifications.
Optimize TMS	www.optimizetms.com	Optimize TMS			●	Aligns shipping needs with lane preference and carrier capacity. Eliminates manual processes, provides reports for decision support.
Oracle	www.oracle.com/scm	Oracle Transportation Management Cloud			●	Manages all transportation activity throughout global supply chains. Supports shippers and LSPs. Applicable for basic transportation needs and/or highly complex logistics requirements.
Paragon Software Systems	paragontruckrouting.com	Paragon Routing and Scheduling Systems	●			Used for operational and strategic route planning, resource management, business modeling, and to optimize home delivery services. Integrates with 30 telematics systems.
Pierbridge	www.pierbridge.com	Transtream	●		●	Streamlines packing, rating, shipping, returns, and tracking processes for parcel and freight shipments, while controlling costs in the warehouse, stores, e-commerce sites or offices.
Precision Software, a Division of QAD	www.precisionsoftware.com	PRECISION Shipment Execution & GTM	●	●	●	Streamlines shipment execution, automates business processes, and handles freight payments. Users can rate, route, produce labels, and manage service levels for any shipment mode.

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			LICENSED TO USER (INSTALLED LOCALLY)	HOSTED ON VENDOR WEBSITE	CLOUD BASED	
Princeton TMX	www.princetontmx.com	Transportation Management Software		●	●	This next-generation TMS software provides tools to improve efficiency, freight spend, load planning, execution and settlement, as well as optimize carrier selection.
ProShip	www.proshipinc.com	ProShip Shipping & Manifesting Software	●	●	●	An enterprise, global solution for companies using multiple modes and carriers—offering rating, tracking, analytics, and auditing. Integrates with existing host systems and warehouse technologies.
Railinc	www.railinc.com	RailSight Supply Chain Visibility Solutions		●	●	Provides critical visibility, ETA and other near real-time rail and intermodal shipment data for shippers, rail equipment owners, 3PLs, and transportation management software providers.
RateLinx	www.ratelinx.com	ShipLinx	●	●	●	Streamlines global shipping with all modes of freight, and supports all major providers including UPS, FedEx, USPS, OnTrac, Purolator, Loomis, Canpar, Canada Post, and more.
Revenova	www.revenova.com	RevenovaTMS			●	TMS built entirely on the Salesforce platform that allows customers and carriers to be managed across all modes all in one place. Built-in accounting.
SaaS Transportation	saastransportation.com	TMS Software			●	Provides cloud-based TMS solutions using API technology and traditional contract management. Allows 3PLs and shippers to automate all aspects of the logistics lifecycle.
SAP	www.sap.com	SAP	●	●	●	Creates and monitors a transportation plan that fulfills constraints such as service level, costs, and resource availability.
ShippersEdge	www.shippersedge.com	Transportation Management System			●	Lightweight TMS works across all modes, integrated or stand-alone.
TECSYS	www.tecsys.com	TECSYS	●	●	●	An end-to-end event tracking and delivery management system. Provides security, visibility, and efficiency throughout the delivery network—from the warehouse dock to customers.
TMC, a division of C.H. Robinson	www.mytmc.com	Managed TMS			●	Single global technology plus logistics management and consulting. Features mode/route optimization, shipment tender, freight payment, yard and dock management, appointment scheduling, and language/currency capabilities.

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			PLATFORM			PRODUCT DESCRIPTION
VENDOR	**WEBSITE**	**PRODUCT**	LICENSED TO USER (INSTALLED LOCALLY)	HOSTED ON VENDOR WEBSITE	CLOUD BASED	
TMW Systems	www.tmwsystems.com	**TMS Solutions**	●	●	●	End-to-end transportation solutions for 3PLs, fleets, and diversified operations. Full order-to-cash workflow, asset and/or carrier management, multi-mode rating and planning, web portals, EDI, customer visibility.
Trans-i Technologies	www.trans-i.com	**TransMobile**	●	●	●	Mobile/web solution for last-mile tracking of transport fleets, with end-to-end visibility, digital POD, status updates, events notification and customer portal. Supports FCL/LCL cargo.
Translogistics	www.translogisticsinc.com	**ViewPoint**	●	●	●	Ensures accurate and timely updates of all shipments, and yields powerful analyses to inform strategic decisions.
Transplace	www.transplace.com	**Transplace TMS™**	●	●	●	Capabilities include business intelligence, reporting and analytics, order management, shipping optimization, comprehensive routing guide, load tendering, status updates, freight allocation, and financial tools.
Transporeon Group	transporeon-group.com/us	**Transporeon & Ticontract**			●	Global cloud platform for intelligent transport logistics that creates a digital connection between shippers and carriers.
Transportation Insight	transportationinsight.com	**Insight TMS**	●	●	●	Quickly make shipping decisions based on cost, service and transit periods. Rate shop and select carriers across multiple modes, create shipping documents, tender shipments, track shipments to their destination.
TransportGistics	www.transportgistics.com	**TGI: TMS**	●	●	●	Features global multi-modal shipment bidding, rating, routing, planning, vendor compliance, execution, visibility, tariff management, freight audit and payment, analysis, business intelligence and data mining.
Transwide	www.transwide.com	**Transwide TMS**			●	Modular and on-demand solution. Enables shippers to source, plan, execute, settle and analyze freight moves. Sales, implementation, support in NA, EU LATAM, APAC regions.
U Route	www.uroute.net	**U Route**			●	Empowers shippers who want to manage their own transportation with logistics tools: bid management, RFQ development, electronic tendering, carrier management, real-time tracking and customized analytics.
UltraShipTMS	www.ultrashiptms.com	**UltraShipTMS**			●	Software-as-a-service TMS, optimizer, private fleet management and settlement solutions for shippers in food production, packaging, manufacturing, retail and other industries. In- and outbound logistics across all modes.

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The St. Louis Region:
Big Developments, Bright Future

For many years, the St. Louis region has offered outstanding logistics advantages to companies that located on the Missouri or Illinois side of the Mississippi River. With a wealth of multimodal transportation options, plenty of available real estate, and a position within one day's drive of 30 percent of the U.S. population, the bi-state area has drawn interest from manufacturers, distributors, and retailers who need efficient access to domestic and international markets.

Recent developments in the area are ramping up the excitement level. In particular, the past 12 months have been a defining period in the St. Louis region's quest to become a premier freight logistics gateway and multimodal hub, as Amazon entered the market and absorbed 1.4 million square feet of speculative space with two facilities in Edwardsville, Ill.

A few key factors drive location decisions for the company's fulfillment centers, notes Nina Akerley Lindsey, with Amazon corporate communications. Company officials want to be as close to their customers as possible to facilitate fast local and regional delivery, but they also look at local workforce. What Amazon has found in the St. Louis region has been great.

"We've been so pleased with the talent we found in the region," says Lindsey. "We're thrilled to be able to provide local jobs to avail ourselves of the abundance of exceptional talent. We're seeing great interest in the positions we have to offer, and both buildings are doing great."

The buildings are doing so great, in fact, that employment numbers have soared past original projections when Amazon announced the facilities in the St. Louis region, stating they would create more than 1,000 full-time jobs.

"Since opening the facilities, we have grown and added more full-time jobs," notes Lindsey. "Amazon currently has more than 1,500 full-time employees in Edwardsville."

While Lindsey does not comment on future expansion plans in the St. Louis region, she does reaffirm that Amazon is growing rapidly. She points to the recent announcement that Amazon will create 100,000 new full-time jobs across the company over the next 18 months, many of them in states such as Kentucky, Florida, and Illinois. "We're definitely seeing growth in Illinois right now," Lindsey says.

Mark Branstetter, a partner at Panattoni Development Company, which developed the Lakeview Commerce Center spec building that

A project to replace the Merchants Bridge with one that can handle two modern freight trains simultaneously could create more than $456 million in economic activity over 20 years–nearly double the impact today, according to its owner, Terminal Railroad Association.

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A Bi-State Development Enterprise

Amazon occupies, highlights the significance of the region's ability to deliver the workforce Amazon needs.

"Location matters, but employment matters just as much when it comes to attracting users such as Amazon," says Branstetter. "Amazon coming here, and growing here, proves we have the labor needed."

Another key ingredient in attracting e-commerce giants such as Amazon is having the available space they need, when they need it, adds Tim Convy,

in Hazelwood, Mo., have attracted manufacturers and consumer products companies. In addition, various third-party logistics firms have recently leased space in the nearby Hazelwood Logistics Park.

While that mix is healthy for the region, Convy says it is Amazon's decision to enter the St. Louis market that will drive future growth, following a record-setting year for the region with more than 6 million square feet of new industrial construction.

both public and private sector leaders, The Freightway is partnering with other freight transportation hubs, starting with the recent signing of a memorandum of understanding (MOU) with the Port of New Orleans.

"This partnership will help create opportunities for St. Louis regional ports and river terminals to capitalize on the recent growth in container-on-barge operations at the Port of New Orleans and the 500 million tons of cargo that annually move through the lower Mississippi River," says Mary Lamie, executive director of The Freightway. "The St. Louis region is integrating supply chains with regions such as New Orleans and others throughout the country."

Building a Bridge

The Freightway is also accomplishing its mission by setting multimodal transportation priorities with regional public and private sector leaders. One of the region's highest priority projects is the 128-year-old Merchants Bridge over the Mississippi River, owned and operated by the Terminal Railroad Association of St. Louis (TRRA). Carrying six Class 1 railroads and Amtrak, this structure serves the nation's third-largest rail hub and is considered a model for public-private partnerships.

TRRA is willing to cover a significant portion of the $220-million project to replace the bridge, and estimates that a new span that can handle two modern freight trains simultaneously could create more than $456 million in economic activity over 20 years—nearly double the impact TRRA generates today.

The Merchants Bridge is not only capturing the attention of The Freightway and the railroad industry, it is also very much on the barge industry's radar.

"While enhancements to the nation's locks and dams are a top priority, we consider the Merchants Rail Bridge to be the number-one infrastructure priority for the St. Louis region," notes

This Panattoni Development building within the Lakeview Commerce Center in Edwardsville, Ill., is composed of concrete tilt-up panels and is designed to expand up to 1 million square feet. This type of new construction helps attract businesses to the St. Louis region.

principal with the St. Louis office of commercial real estate services firm Avison Young.

"As a broker working for an international company, we know that if we don't have product, our customers will move on," Convy says. "Panattoni has had the confidence to build spec facilities in the St. Louis region and, therefore, we've been able to attract companies such as Amazon."

Such industry giants are not the only companies turning to the St. Louis region; the other spec facilities recently completed at Panattoni's Aviator Park

"There's a herd mentality in the industry," says Convy. "Amazon's presence validates the region."

That is exciting news for the St. Louis Regional Freightway, which is tasked with optimizing the region's freight transportation infrastructure and advancing its position as a world-class distribution hub.

Officially launched in April 2016, The Freightway is already playing a critical role in the growth of manufacturing and fulfillment centers within the bi-state region. Through a unified bi-state regional collaboration, including
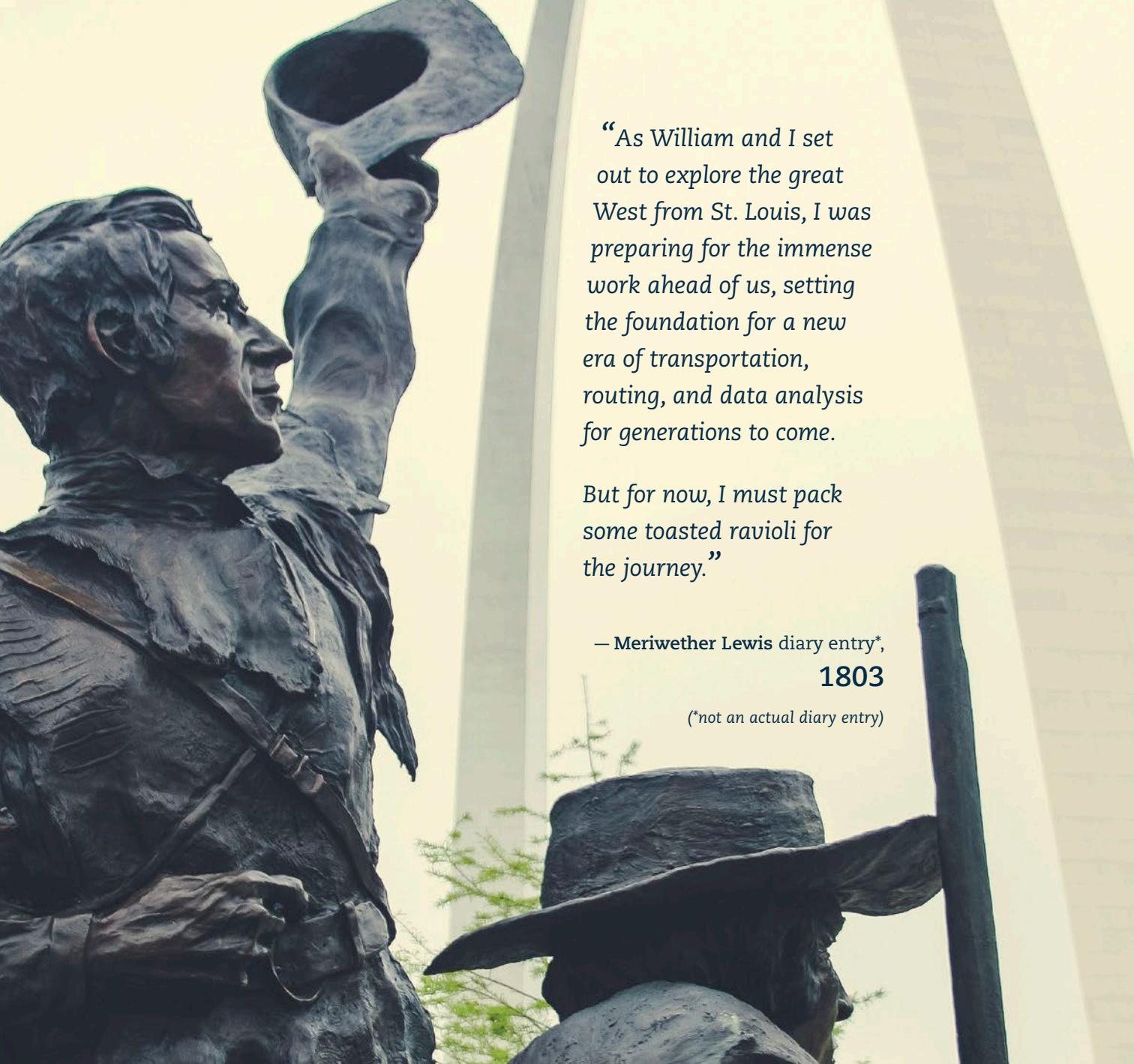
"As William and I set out to explore the great West from St. Louis, I was preparing for the immense work ahead of us, setting the foundation for a new era of transportation, routing, and data analysis for generations to come.

But for now, I must pack some toasted ravioli for the journey."

— **Meriwether Lewis** diary entry*,
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(*not an actual diary entry)

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The St. Louis Region:
Big Developments, Bright Future

The Board of Commissioners of the Port of New Orleans and the St. Louis Regional Freightway sign a Memorandum of Understanding to exchange market and operational information. The goal is to expand trade and build upon existing and new business relationships between the two regions and critical ports.

Tim Power, president of SEACOR Inland River Services/SCF Marine Inc. "Competitive barge rates are contingent to competitive rail rates."

Such agreement among various stakeholders on the region's priorities will improve The Freightway's ability to coordinate with industry and government to ensure the region's infrastructure can handle the growth as they work to enhance and increase the $6 billion in goods traveling through the St. Louis region by rail, road, river, and runway.

Branstetter sees The Freightway as the region's first concerted regional effort to pursue logistics and freight as a focus area, and he remains bullish on the region's potential for continued growth. "I don't think the growth we saw in the past 18 months is a one-time thing," he notes. "The future in the St. Louis region looks very bright."

Roads, Rail, and River

The initiatives leading to that bright future in the St. Louis region build upon a well-established foundation of logistics assets. Take the four interstate highways that converge there. I-44

provides a direct link to St. Louis, Tulsa, and Oklahoma City; I-55 to Chicago, Memphis, and New Orleans; I-64 to Missouri, Kentucky, West Virginia, and Virginia; and I-70 to Denver, Kansas City, Indianapolis, Columbus, and Baltimore. Those highways put much of the Midwest with one day's drive and offer two-day access to multiple East Coast and Gulf ports.

To keep freight and other traffic flowing, communities in the St. Louis metropolitan area have recently completed several important highway infrastructure projects. One is the Stan Musial Veteran Memorial Bridge across the Mississippi, a $670-million project that connects St. Louis and southwestern Illinois via I-70.

Another initiative has rebuilt the Daniel Boone Bridge to extend I-64 across the Missouri River. The Illinois Department of Transportation has made improvements to the Martin Luther King Bridge, while the Missouri Department of Transportation is doing work on the Poplar Street Bridge in St. Louis.

The history of rail transportation in the region dates back to 1852, when the first leg of the Pacific Railroad opened in

St. Louis. Today, the region is the third-largest rail hub in the United States. Six of North America's seven Class I railroads serve St. Louis, providing freight transportation throughout the continent without need for interchange.

Connection to the World

These rail lines connect the region not only with major markets in the United States, Canada, and Mexico, but with the world, via ocean ports on the East and West Coasts and the Gulf of Mexico. Several shortline railroads add to the number of options available to companies that ship by rail.

Six intermodal yards accommodate freight moving into and out of the St. Louis region:

1. BNSF's St. Louis Intermodal Terminal, St. Louis. Located near I-44, this facility processes about 60,000 lifts annually. Close by, BNSF has bought 111 acres of developable land at the Fenton Logistics Park.

2. Terminal Railroad Association Rail Yard, Madison County, Ill. The region's largest rail switching facility, this terminal handles about 30,000 cars per month. The yard's 80 tracks provide

enough capacity to hold 2,200 cars at one time.

3. Norfolk Southern Luther Intermodal Yard, St. Louis. Located on more than 30 acres, this facility offers quick access to I-70.

4. CSX East St. Louis Intermodal Terminal (aka Rose Lake Yard), Fairmont City and Washington Park, Ill. This facility, part of CSX's Southeastern Corridor, handles both domestic and intermodal freight, with an average of 60,000 to 70,000 lifts per year.

5. Union Pacific Dupo Intermodal Terminal, Dupo, Ill. Thirteen intermodal trains originate at this facility each week, with service to Dallas, Los Angeles, and Seattle. The yard is situated conveniently close to I-255 and Illinois Route 3.

6. Kansas City Southern Valley Junction Yard, East St. Louis, Ill. Three Terminal Railroad Association lines converge in this yard, bringing it several dozen trains each day.

As the recent partnership with the Port of New Orleans illustrates, river transportation also plays a prominent role in the St. Louis region's portfolio of transportation options. Each year, 105 million tons of cargo pass, arrive, or depart by water, benefiting from the region's status as the northernmost port on the Mississippi where there is no need to contend with locks or ice.

Major commodities loaded on and off barges in the region include fertilizer, steel, manufactured products, coal, petroleum products, and agricultural crops.

Local facilities include:

■ **America's Central Port, Granite City, Ill.** This facility handles dry bulk, liquid bulk, general cargo, roll on/roll off (Ro/Ro) cargo, and container on barge.

■ **St. Louis Port District.** The third-largest inland port in the United States, it offers services for dry bulk, liquid bulk, general cargo and Ro/Ro. The Port District includes 19 miles of riverfront and more than 6,000 acres available for industrial use.

■ **Kaskaskia Regional Port District 1, New Athens, Ill.** This facility includes a bulk terminal, a Ro/Ro ramp that handles oversized equipment, a barge with a hydraulic track-hoe and conveyor for loading trains, and a train loop that can handle up to 125 units.

■ **Kaskaskia Regional Port District 2, Baldwin, Ill.** This port handles steel, general cargo, bulk products, and container on barge. Facilities include a 50-ton overhead electric crane and 30,000 square feet of warehouse space, with temperature and humidity controls.

For shippers that use America's Central Port, one of the major attractions is the assortment of transportation options there—river, rail and road.

With its capability to directly transfer freight from plane to truck, MidAmerica St. Louis Airport attracts shippers looking to bypass more expensive routes through other midwestern cities.

Lock #27, the southernmost lock on the Mississippi, sits between the port's two harbors, giving barges access to the free-flowing river from the port all the way to the Gulf of Mexico. The Port District's new Madison Harbor actually sits below the lock, providing the opportunity for uninterrupted movement. America's Central Port opened the $50-million Madison Harbor in February 2016.

"That harbor opened a lot of new opportunities," says Dennis Wilmsmeyer, executive director at America's Central Port. "We're now gearing up for general cargo movements. Our operators have been moving dry bulk products through there on barges for a full year."

One of the region's six Class I railroads, Norfolk Southern, provides service at America's Central Port. Two Class III carriers, Terminal Railroad and Port Harbor Railroad, also serve Madison Harbor. "The Class I railroads own Terminal Railroad, so shippers have access to all the Class I railroads through their switching setup," Wilmsmeyer says.

In addition, the port provides easy access to the interstate systems, with a connection to I-70 just two miles south of the property.

That rich mix of transportation modes offers benefits even to companies near the port that stay with a single transportation mode.

"We've had companies say they wanted to move here because of the rail, but they've never used it," Wilmsmeyer says. Rather, they employ the rail as a bargaining chip. "Every time a trucking company tries to raise its rates, the companies say they need to get some quotes from the rail line." That prospect of competition is enough to persuade the trucker not to change its rates.

A Win-Win Situation

Thanks to The Freightway's MOU with the Port of New Orleans, America's Central Port could be handling even more volume in the future than it does today, especially container on barge. "That MOU allows us to market the Port of New Orleans as ours, and for them to market America's Central Port as theirs," Wilmsmeyer says. Container on barge will add a new, cost-effective intermodal option for shippers moving goods into or out of the Midwest.

To better handle that and other cargo, America's Central Port recently improved its facilities. "In December 2016, we finished about 4.25 miles of new track construction on the property," Wilmsmeyer says. "We made new roadway improvements at the same time."

In addition, the port has been adding to the properties available for lease on its 1,200 acres, about two square miles. "We have two new warehouse buildings—one a 126,000-square-foot chemical manufacturing facility, and the other a 26,000-square-foot dry bulk storage building," Wilmsmeyer says.

Companies that currently operate facilities at the port include ethanol producer Green Plains, Phillips 66, Apex Oil, Cargill Steel, and U.S. Steel.

But the port's own property represents just a fraction of the territory available to companies that want to take advantage of this riverside transportation hub. "More than 13 local communities, all situated along the Mississippi River, have opportunities for commercial or industrial development," Wilmsmeyer says. That territory covers about 200 square miles. Port officials and community leaders collaborate to identify the best location for each company that wants to move into the region.

"We ask many questions, we find out a lot about the company, and we get all the players in the room who can answer their questions," Wilmsmeyer says. "If it makes more sense for that company to locate in one of those communities, we work just as hard, if not harder, to get them to locate there as we would to get them onto our own property."

For shippers that employ air transportation, the St. Louis region provides a choice of two international airports that offer air cargo services: St. Louis Lambert Airport in St. Louis County

and MidAmerica St. Louis Airport in St. Clair County, Ill.

St. Louis Lambert handled 70.5 million tons of cargo in 2016, and operators at the airport include three all-cargo carriers. Adjacent to Foreign Trade Zone #102, St. Louis Lambert's cargo facility space includes bonded storage and secured warehouses.

Co-located with Scott Air Force Base, MidAmerica St. Louis offers, among other amenities, a 17-acre air cargo facility next door to a 60,000-square-foot air cargo terminal designed for perishables. "We have one-stop shopping here that allows for a cargo carrier to consolidate and upload or download and distribute into or out of the region through a warehouse that is the largest perishable center north of Alabama on an aircraft parking ramp," says Tim Cantwell, airport director at MidAmerica.

North Bay Produce of Traverse City, Mich., owns and operates the facility in partnership with the airport, which uses the warehouse as part of its own supply chain and also offers service to other shippers. The airport provides the ground services and labor for loading and unloading; North Bay provides services such as forced air cooling, short- and long-term storage, and USDA-approved cold treatment and fumigation services. "With one phone call, shippers can coordinate everything," Cantwell says.

The MidAmerica Advantage

North Bay Produce chose MidAmerica St. Louis for its central U.S. distribution site because of the airport's relationship with Ningbo Lishe International Airport in China. "Ningbo, with our coordination, developed what is currently the only perishable center on an aircraft ramp in China," Cantwell says. North Bay hopes to take advantage of that relationship in its own operations, he adds.

While offering special facilities for perishables, MidAmerica also handles many other kinds of cargo. "We do a lot of specialized charters," Cantwell says, citing a flight that recently transported a helicopter to Jordan. "We're convenient, with low traffic and two runways."

Because the Air Force operates air traffic control for the facility, planes can take off from and land at MidAmerica 24 hours a day, seven days a week. The U.S. Customs office at the airport, located on the cargo apron, also operates 24/7, he says.

The relationship with Scott Air Force base offers other advantages as well. "They provide 24/7 snow removal, so there's never a closure here during inclement weather," Cantwell says. Also, because the airport shares services with the Air Force, keeping overhead low, MidAmerica offers unusually low fees to carriers that operate at the airport.

For companies that locate

distribution centers or other facilities near MidAmerica, Scott Air Force Base offers another advantage. A major supply chain hub for the Air Force, Scott employs large numbers of logistics professionals who, when they leave the Air Force, could lend their talents to companies in the region. "The average retirement age of a military member is between 43 and 47," Cantwell says. "So you've got a lot of experience that could walk across the street and make an immediate impact on the civilian front."

Shippers will also find plenty of land ripe for development when a new exit on Interstate 64, adjacent to the airport, opens in summer 2017. "That intersection will open up 2,500 acres of developable warehousing, light assembly and manufacturing land on the airport, with direct access to the highway," Cantwell says.

That land is authorized to operate as part of Foreign Trade Zone #31 and also benefits from a local tax incentive program. "As soon as that opens, I expect a lot of opportunities for people who want to warehouse in a convenient place for both road and air access for their goods," he adds.

Ample real estate and multiple transportation modes are among the biggest benefits that companies enjoy when they locate facilities in the St. Louis region, according to Dan McClain, director of business development at McClain and Associates in Maryland Heights, Mo.

"There are lots of opportunities for growth," McClain says. "For example, we've seen Amazon, World Wide Technology and other companies locate their warehouses in the Southern Illinois area."

Anywhere You Want to Go

The local transportation network offers numerous ways to connect with all points in the United States and beyond. "The Interstates can take you north, west, east or south," he adds. "We have multiple airports. We have six Class 1 railroads, and the river system provides a big advantage for moving shipments north and south."

The Missouri Department of Transportation (MoDOT) has been particularly good about soliciting recommendations from local companies when prioritizing their transportation investments. "They're using input from people in the region to motivate how they improve the infrastructure," says McClain.

As a non-asset-based 3PL, McClain and Associates provides transportation services for truckload, less-than-truckload, and intermodal shipments, using a proprietary transportation management system. For truckload moves, the company can provide flatbed and oversized equipment as well as dry van and temperature controlled trailers. The company manages intermodal moves using 53-foot containers and 40- or 45-foot containers owned by steamship lines.

Although McClain and Associates serves shippers throughout the continental United States, its customers in the St. Louis region may gain some extra benefit due to the volume of intermodal traffic that moves through the area.

"A lot of 45-foot steamship line equipment resides in St. Louis. And there's a daily plethora of domestic equipment in St. Louis that we can load for trips to the East and West Coasts," McClain says. "For one client, we were able to convert a lot of flatbed business to intermodal for movements into the Western U.S. and into Canada." McClain and Associates promotes such money-saving opportunities to shippers and also urges some of its carrier partners to take advantage of this abundant capacity.

Central Location, Large Network

McClain and Associates' location in the St. Louis region provides another advantage to its customers, no matter where they are based. "We're able to expand our network," McClain says. "Because we're right in the middle of the country, that gives us access to carriers everywhere, on all coasts, and moving in all directions. We can be more competitive with our rates, because our network is larger."

Healthy competition—which keeps rates in check—also arises from the fact that St. Louis, itself a hub for manufacturing and logistics, is located close to two other major hubs, Kansas City and Chicago. "That's a positive thing for

The University of Missouri helps supply the talent pipeline in the St. Louis region. Here, Dr. James Campbell and Dr. Andrea Cadenbach (*far left, far right*) tour a Graybar warehouse in Bel-Ridge, Mo., with two supply chain students.

manufacturers and distributors, or anyone else locating here," says McClain. "It also ensures that everyone is honest and up to date."

Like Amazon in Edwardsville, a company that locates in the St. Louis region will have no trouble finding employees with the knowledge and skills to fill positions in logistics and supply chain management. Six universities in the region offer degree programs and certificates in those disciplines. They include:

1. Fontbonne University. Certificate and MS in supply chain management, undergraduate minor in transportation

2. Lindenwood University. MBA in supply chain management

3. Maryville University. MBA with a concentration in supply chain management/logistics

4. St. Louis University. Certificate in integrated supply chain management, MBA in supply chain management

5. University of Missouri, St. Louis. Undergraduate minor in transportation studies, BSBA in logistics and operations management, MBA in logistics and supply chain or operations management, PhD in logistics and supply chain management

6. Washington University. Undergraduate minor, BSBA or MBA in operations and supply chain management, MS in supply chain management

Filling the Talent Pool

Companies in the St. Louis region that need to fill supply chain and logistics positions will find enthusiastic allies at the University of Missouri, St. Louis (UMSL). "The number one thing that companies are interested in is the talent pool. Our goal is to fill their talent pipeline," says James Campbell, professor and chair of the Supply Chain and Analytics Department in UMSL's College of Business Administration.

Many businesses in the region maintain productive relationships with the program. "Our big theme is Connecting with Business," Campbell says. "We provide an opportunity for our students to start great careers in supply chain and logistics, and then we provide the companies the talent they need."

As an example, Campbell points to a recent undergraduate student who was triple-majoring in French, International Business, and Logistics and Supply Chain Management. "At one of our student engagement events last fall, she met some folks from Anheuser-Busch (AB InBev), who just happened to need someone to work on exports to Canada." Upon graduation, that student took a job as senior analyst II, logistics exports with the beverage firm.

AB InBev is one of a distinguished list of companies in the St. Louis region that serves on the Supply Chain and Analytics Department's Advisory

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Board. The board also includes Boeing, Graybar, Unyson Logistics, Ameren, Monsanto, Express Scripts, World Wide Technology, Nidec and others.

Students aiming for careers in supply chain and logistics management connect with professionals from those and other companies at on-campus events that combine presentations by industry speakers with networking opportunities. Some Advisory Board members also form mentoring relationships with the program's most promising students.

In addition, companies seeking supply chain and logistics talent benefit from UMSL's strong internship program. One notable example is Unyson Logistics.

"We've had an unofficial partnership with Unyson for 25 years, where we feed them interns who then become employees," Campbell says. Boeing receives many interns from across the entire College of Business. "Even if they start in accounting, finance, or marketing, many find their way into a great career in supply chain," he says.

Faculty in the Supply Chain and Analytics Department have long collaborated on applied research with companies around the world. Now, they're ramping up efforts to focus more of that work in the St. Louis region.

In one current project, UMSL researchers are working with a local non-profit, Operation Food Search, on a more efficient way to route trucks that pick up food items that are then directed to needy residents. "We're going to do a summer pilot project looking at improving the truck routing, which we then hope will grow into a larger-scale implementation across the entire region," he says.

Campbell and a colleague also recently worked with a St. Louis-based omnichannel sporting goods retailer that needed help expanding its fulfillment network. "They had a single warehouse in St. Louis and wanted to add something on the East Coast to deal with expansion and all their e-commerce," Campbell says. "We did a project for them, which we're working on getting published, that looked at how to design their network and locate e-commerce warehouses."

Well-Trained Workers

Another local company that has benefitted greatly from supply chain and logistics programs at universities in the region is St. Louis-based Sunset Transportation. "We have a huge labor pool entering the workplace with a strong foundation of supply chain knowledge," says Lindsey Graves, vice president, operations at Sunset.

Sunset Transportation serves customers throughout the United States with logistics management and freight audit and payment services. It also offers a suite of cloud-based technology solutions for functions such as rating,

McClain brings visibility to shippers by connecting stakeholders with their carriers via customized portals and analytics.

routing, tracking and bid management.

Although Sunset's customers belong to a broad range of industries, the company does a great deal of work for mid-market food and animal feed businesses. In addition, it manages a lot of industrial material and manufacturing freight, including shipments requiring specialized equipment.

Top-quality service is a particular concern for those customers. The stream of qualified candidates graduating from logistics and supply chain programs in the region offers a particular advantage to high-service freight.

"There's talent with passion for our industry, which makes it easier for us to hire, develop, and keep good people," Graves says. "Passion for our business and our customers sets us apart and helps us continue to improve and grow."

Growing Job Market

Shippers that locate in the St. Louis region enjoy a similar advantage when they hire for internal logistics and supply chain positions. "Not only do they gain access to a deep pool of talent, but the lower cost of living in the area makes for a growing job market," Graves says. "We have a lot of trouble hiring for our Chicago office, in comparison."

Amazon's decision to locate its two facilities in Edwardsville further demonstrates the region's attraction. "They have the strategic resources to know where the next generation of distribution will set up shop," Graves notes. "It speaks volumes for doing business in the St. Louis region."

Nathan Chew, president of St. Louis-based Range Logistics, also sings the praises of the logistics and supply chain programs at the region's institutions of higher learning, particularly St. Louis University and Washington University.

"I graduated from St. Louis University years ago, and I couldn't have told you what logistics meant if you'd asked me back then," he says. Now that school and Washington University both run widely acclaimed programs in that discipline.

"We've attended job fairs at both locations," Chew says. "We've recruited some of our employees from those programs."

A non-asset-based third-party logistics company, Range Logistics provides a single point of contact for managing transportation throughout North America and around the world, by any mode.

"We have the ability to courier a package locally—same day, five miles down the road, with a guy on a bicycle," Chew says. "On the flip side, we're able to coordinate ocean containers, for example, to the Department of Defense military bases in Guam and Japan."

While Range Logistics does a lot of work with shippers in the food and beverage and consumer products industries, it serves a wide range of companies.

"One large client makes plastic bottles in which other companies put products such as peanut butter and mayonnaise," Chew says. "We ship those finished plastic bottles to distribution centers across the United States."

Aside from its workforce, the St. Louis region offers several other advantages, Chew says. One is unparalleled access to multimodal shipping options, including transportation by highway, rail, air, and barge. Thanks to those diverse shipping options, Range's customers located close to the 3PL's headquarters gain even greater efficiencies than the company can offer in other parts of the country. "Being in St. Louis increases our ability to optimize the modes," he says.

Low rates of traffic congestion in the St. Louis region compound that advantage. "When measured against 25 other metropolitan areas in the United States, St. Louis is consistently near the bottom in terms of congestion," Chew says.

Between the free-flowing traffic and central location, shippers in and around St. Louis gain a speed to market that provides a significant edge in today's commercial environment. "Everybody is moving more toward 'I need that product yesterday,'" Chew says. "The ability to put your warehouse or distribution center in a region that has extremely low congestion, so your products can move with ease, and where you have a large number of consumers within a day's travel, is big."

In fact, everything about the logistics opportunities in the St. Louis region is big—and with all the new initiatives in progress, those advantages will only continue to expand. ■

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America's Central Port is at the center of the U.S. multi-modal freight transportation system. It offers direct access to all three major transportation modes–rail, river and road. America's Central Port offers over 1.7 million square feet of rail-served warehouse space in Granite City, IL, just minutes north of downtown St. Louis.

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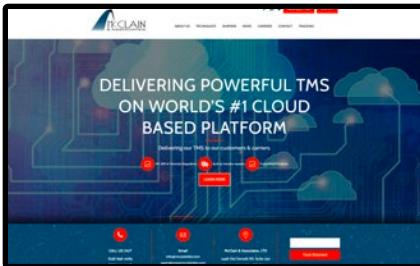
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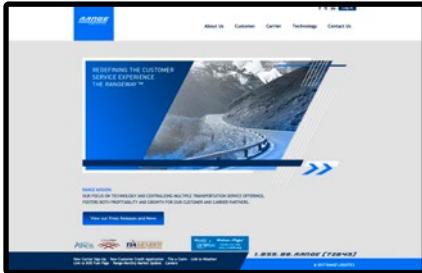
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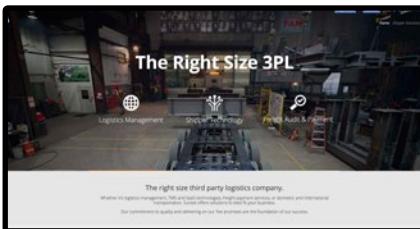
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What You Need to Know When Selecting a Dock Appointment Scheduling System

Q: What is dock appointment scheduling?

A: Dock scheduling is a means for managing the timeliness of inbound and outbound transportation (truck traffic) at your loading docks in order to maximize the efficient operation of those docks.

Q: What is the difference between Appointment Management and a Dock Scheduling System?

A: Appointment management usually takes the form of a spreadsheet or commonly available online calendar (such as Outlook) that tracks the time slots your carriers/suppliers want at your dock. It has to be managed by a human scheduler, who keeps track of changes and conflicts, and keeps it up to date.

A Dock Scheduling System moves beyond appointment management by enabling sophisticated prioritization of customers, suppliers, loads, product types, carriers, and more, depending on your specific business needs. In essence, it's a capacity planning tool, or a smart-schedule.

It allows direct communication between the system and carriers/suppliers, and enables real-time visibility via a web portal to anyone who needs it, including carriers, suppliers, internal staff, or customers.

A dock scheduling system should also have reporting capabilities that include audits on loads delivered, enabling compliance information to be recorded and transmitted automatically, and authoritatively.

Senior Vice President,
Sales & Marketing
C3 Solutions

GREG BRAUN

Q: What are the top five functions a Dock Scheduling System should provide?

A: Here are 5 essential functions anyone should be looking for in a dock scheduling solution.

1. **A web portal that is accessible by both carriers and suppliers.** This 24-7 self-serve option would allow them to book their own appointments and update the schedule as needed.

2. **It should be possible to transmit automated notifications, such as appointment confirmations, to users by email.** You should be able to choose which action should trigger a notification and which users should receive them.

3. **The ability to apply rules and constraints in order to transform the schedule into a smart planning system.** Whether as simple as differentiating between palletized or non-palletized shipments, or with complex logic based on product type, POs, vendors, and more, you should be able to get a system that will work to the rules that will optimize your operations.

4. **Automation allowing for every request that fits within your schedule and constraints to be automatically processed without any user intervention.** Permitting appointment requests to be automatically approved is a great feature, yet the level of automation should be customizable, allowing users to decide which carriers receive fully automated services and which still need hands-on attention.

5. **Standing appointments functionality that allows to not only book the loading dock space, but also preconfigure the labor and space requirements in the warehouse.** You should also be able to configure expiration dates for cancellation and free up the slot for another user.

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What to Expect From Your 3PL

Q: As supply chain operations continue the migration from an afterthought in the warehouse to a priority in the boardroom, what are some questions a shipper should ask before adding a 3PL to their supplier base?

A: It largely depends upon what level of partnership a carrier is seeking. Managing spot capacity is very different from integrating a TMS and/or outsourcing bid management. Ultimately, shippers need to understand what internal mechanisms ensure accountability from the third-party logistics (3PL) provider, and what insights will be brought to bear for continuous improvement.

The first step is the solution design phase. What are the pitfalls and challenges the shipper is facing today? It's important the shipper be candid and share their goals so the 3PL can have the right people and processes in place. That said, it's a given that an issue will arise at some point, so what is the 3PL's infrastructure or process for performing a root cause analysis and then implementing an SOP to prevent a repeated failure? What type of data harvesting or analytics is the 3PL performing, and where are key areas they look for optimization after the partnership has begun?

Q: What are some best practices for the shipper to hold the 3PL accountable to its promises after onboarding?

A: It's critical to identify mutually agreed upon KPIs and a cadence for measuring the 3PL's performance. Many of our large-scale clients have formal monthly or quarterly scorecards where they measure metrics including:

- On-time pick-up and delivery
- Tender acceptance
- TMS update compliance
- Service failures
- Benchmarked savings
- Freight bill pay and audit accuracy

The 3PL should be prepared to discuss any discrepancies, but also to proactively suggest solutions, including data submitted with the tender, potential for drop-and-hook or consolidation programs, or the possibility of altering a shipping schedule to ensure maximum ROI for all affected stakeholders.

Transactional clients typically have more fluid conversations with their account executive regarding response time, tracking updates, and billing accuracy. Regardless of the size or scale of the relationship, the 3PL should be the subject matter expert, so the shipper should hold them accountable to being responsive to requests and proactive with suggestions.

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JON RUSSELL
President
Celadon Logistics

Supply Chain Complexity: What's Behind Supply Chain Disruption And Why You're Not Achieving Consistent ROI Improvement

In a 2016 Gartner survey, 63 percent of supply chain leaders reported "increasing supply chain complexity" as the highest risk to business continuity. A second survey from Gartner identifies supply chain complexity as #4 in the list of obstacles to achieving supply chain goals. As supply chain leaders face these challenges, they should focus on optimizing networks to reduce their organization's risk to operations.

As an example, a retailer who had grown by mergers and acquisitions experienced long product delivery times, increasing labor cost, low profitability and slow to no growth in its business. Products traveled through a network of crossdocks before reaching the final distribution center and, in the process, were handled multiple times. All the while, this retailer was focused on maintaining high service levels at its stores. This led to expedited shipments and all products being stocked at all distribution centers. As a result, operations ran at a much higher cost, requiring more cash flow.

Q: What are some of the main causes of supply chain complexity?

A: Consider the following.

- **Growth in new countries, regions or markets:** Cross-border shipments, long transportation lead time, storage and distribution all compound complexity.
- **A focus on customer needs and service:** Transition from single-channel to multi- and omni-channels, all while enhancing the customer experience, can make the management, storage and distribution of products very complex. The shipper also has to manage smaller order sizes and higher inventories, both of which lead to lower productivity. Customizing products can lead to proliferation of stock-keeping units (SKUs) and increasing overall inventory.
- **Rapid growth:** Growth can lead to increased inefficiency, and duplication of products and locations, all negatively impacting productivity.

Q: What can I do to reduce supply chain complexity?

A: If you feel these or any other negative impacts of operational complexity, you can use analytical techniques such as network optimization to model and identify opportunities to simplify your network. Supply chain design impacts up to 80 percent of supply chain operating costs. Understanding how location of plants and distribution centers, supplier selection, customer service level decisions, and customer assignments all work together is imperative.

Optimizing a supply chain network starts by collecting operational, transportation, and product data. Mathematical models are developed to identify business rules and inefficient location, inventory, supplier and customer assignments. Companies need to invest in setting up, closing, or reconfiguring facilities and negotiating with customers on service expectations. It is typical to achieve between 10 and 15 percent reduction in supply chain operating costs by taking out complexity. These projects typically need sponsorship from chief supply chain officers, and impact a number of different business units.

A lead logistics provider such as Schneider can perform network optimization studies to help customers simplify their supply chain operations, as well as to manage the entire transportation operation and provide technological solutions—such as transportation management systems—to optimize transportation decisions and provide continual year-over-year savings.

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NIKHIL ARORA

Director, Logistics
Engineering
Schneider Logistics

How Small Retailers Can Compete With Retail Giants

Q: What is the biggest thing for shippers to consider in their supply chain?

A: The one constant trend is the growth in the way we reach consumers. E-commerce sales increased 15.6 percent in 2016, and there are no signs that this trend will slow in the future. Direct to consumer is here for the long run. How we manage that process to give consumers what they want is critical.

Q: How can small to mid-size e-commerce and retailers partner to compete logistically against giants such as Amazon and Walmart?

A: To compete in today's environment, small to medium players need to offer competitive supply chain and delivery services, and they need to find those solutions in the market, since they don't have the scale to replicate them on their own. Today's third-party logistics (3PL) providers and leveraged platforms are offering more shared services to help these shippers. Pick a partner who has experience in a global and local environment.

The number-one thing for the small to mid-size shipper to understand is that they don't have the critical mass to recreate what the largest entities can.

Q: Why 3PLs?

A: Today's 3PLs are leveraging their buying power, carrier and supplier relationships and software to put together seamless packages for clients. In a perfect world, the 3PL can handle all the pieces from international shipping to the United States; U.S.-based fulfillment, and final delivery—from small package and parcel to full white-glove delivery. This gives the client a couple of essential advantages: cost and visibility in a single solution.

Q: What are some of the other advantages for shippers?

A: In a shared environment, leveraged platforms are the best at connecting shippers with the best-fit solutions. Without critical mass to generate your own dedicated environment, 3PLs can create a repeatable and reliable process for delivery. An example for white-glove delivery would be having multiple delivery networks that are capable for the particular product. Without critical mass and repetition, consistency and quality are difficult to maintain. A 3PL that has multiple relationships can have a final-mile network that works for gun safes, and another that works for furniture.

Q: What do you see as one of the biggest challenges for white-glove shippers?

A: In addition to free shipping, the biggest item that the consumer wants today is speed. Most consumers don't understand, or care to understand, the difference between two-day small parcel and four-week furniture deliveries. The 3PLs that offer quick transit solutions for their clients will help them win more customers. That could range from a faster line haul portion to forward inventory deployment of inventory in key markets. Small to medium size e-commerce players can compete with the big guys; they need to make sure they pick the right partner to help them succeed.

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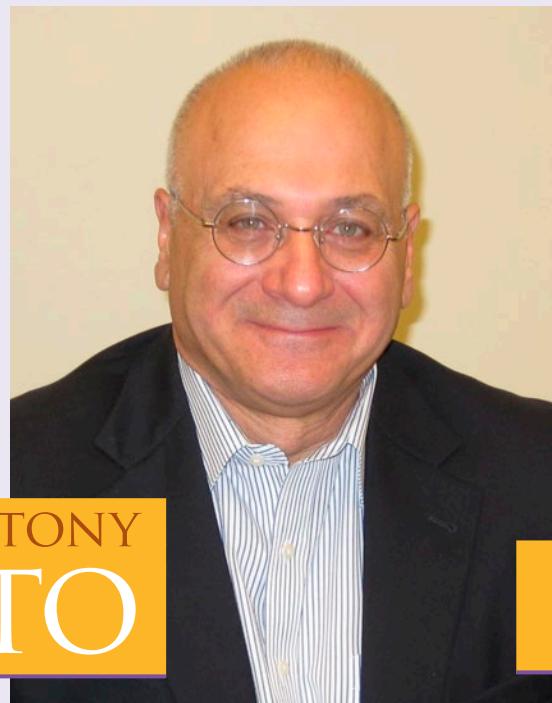
TONY COLETTO

Director of
White Glove Logistics
R.R. Donnelley
Worldwide Logistics

Does Your TMS Provide You a ClearView?

Q: What are you seeing as the biggest opportunity for TMS functionality?

A: Transportation management software (TMS) was developed for the simple task of enforcing carrier routing and producing a shipping label. Web rating, or rate shopping, was a major advancement to the TMS technology industry 10 years ago. Today, very few TMS companies offer functionality beyond rate shopping. Once the shipment leaves the dock, the job of most TMS technologies is complete. The future of TMS systems is not only to monitor service in real-time while the package is in transit, but to properly audit the carrier's invoice to ensure that companies can analyze shipments through invoice settlement and beyond.

Q: Don't most TMS systems audit freight bills?

A: No. A lot of transportation management systems in the market mistake auditing with simple 'bill matching.' Matching the quote to the invoice is not a best practice in freight payment and audit. Technology alone cannot provide proper freight audit services, carrier payment, and general ledger coding services. Filing disputes with providers and monitoring of changes in carrier billing policies or rules tariffs is vital to post-shipment visibility of supply chain events. It is very important that shippers do not confuse bill matching with audit.

Freight payment and auditing companies perform their detailed invoice reviews based on carrier rules and invoices validated against those same carrier rules. In many cases, carrier APIs are not correct and the rates that are received by even the most advanced TMS are not what appear in the carrier's rules tariff, nor the carrier invoices. Often the TMS must make the adjustment to fix the rate received from the API so that proper execution decisions can be made.

Q: Will TMS technologies in the future provide best practices in freight auditing?

A: Not likely. The North American shipping market has not pushed TMS technologies to exhibit intimate knowledge of the transportation industry nor carrier's rules tariffs. TMS technology compa-

BRAD
HOLLISTER

Executive
Vice President
ClearView Audit

Q: Looking at ClearView's suite of solutions, what makes you different?

A: ClearView Audit has taken an unprecedented approach to transportation execution. By providing clients with dynamic load planning between all modes of transportation, monitoring shipments in real time during transit, and settling invoices, our rapidly growing customer base has all of the tools necessary to monitor supply chain performance in real time. ClearView often encounters companies who have purchased a TMS where rates are loaded incorrectly or carrier tariff rules are not updated.

nies are not equipped to handle paper invoices nor source their own EDI integration with carriers to handle such large tasks for fees as low as 50 cents per invoice. TMS companies lack the resources to perform the services and auditors lack the technology resources to provide TMS systems. The shipper is caught in the middle as the only party left holding the bag when charges are incurred, but not caught by the TMS system or the auditor.

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Advice for Transportation Departments:
Gaining Corporate IT Buy-in for TMS Solutions

Q: **What pushback should transportation leaders anticipate from IT when proposing a TMS implementation?**

A: Corporate IT departments are frequently ambivalent about cooperating; sometimes even actively working to undercut the proposed initiative because there's a perception that any new enterprise software deployment adds significantly to IT's workload during implementation, integration, and thereafter with respect to maintenance, training, and support.

Q: **You're suggesting these concerns are unfounded?**

A: Yes and no. Some TMS solutions require significant effort from the customer's IT department to deploy and maintain. The distinction is between on-premise solutions and Software as a Service (SaaS) or "cloud" solutions. IT departments are typically stretched thin and adding another on-premise solution — with the hardware maintenance and user support burden involved — means more work and responsibility. Conversely, a cloud-based TMS from a reputable provider requires very little time or effort of an IT department.

Q: **Why does a cloud TMS require so much less attention from the customer's IT department?**

A: The SaaS model TMS is hosted on servers owned and maintained by the TMS solution provider so there's no server (or any other hardware) configuration or maintenance required of the customer. The only thing IT has to ensure is that logistics users have a current web browser like Firefox or Chrome installed on their desktops/laptops/tablets. Any system/user configurations are handled by the solution provider.

Scaling up or down, adding or removing users, configuring permissions, and most other tasks are also handled by the provider. So is user support like resetting passwords and all other typical help-desk support. Further, user training is not something IT has to manage. That, too, is done by the provider.

Q: **Aren't integrations for a new TMS labor intensive for IT?**

A: Not for today's leading SaaS TMS offerings. Remember, contemporary cloud solutions are built using Service Oriented Architecture (SOA). SOA is a software design strategy for simplifying integration across all systems. Cumbersome legacy integration protocols are replaced with web-services platforms that connect systems via APIs for faster, standardized integration. Modern web services employ powerful data encryption to ensure data security.

Don't be misled by IT's suggestion that integration is an obstacle stopping you from selecting a real Transportation Management System, instead settling for a limited logistics tool bolted on to an ERP solution.

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SHANNON
POTTER

Director of Application
Development
UltraShipTMS

Is a 3PL Not the Best Fit for You?

Q: While some companies have chosen to rely on 3PLs to manage their logistics, Progressive Converting made the choice to keep its logistics in house. Why?

MR: Progressive Converting (Pro-Con) is a service provider to the major paper companies. As such, controlling all aspects of the supply chain is critical in delivering value to our customers. We chose to keep our logistics operations in house because we need to manage the flow of inbound and outbound freight to maximize operational efficiencies on our production lines. Given we are a quick-turn supplier with order lead times that are often less than 24 hours, we need to maintain control of our shipping area to ensure freight does not disrupt our overall operations.

Q: How has the looming capacity shortage influenced your decision to manage your own transportation procurement?

MR: Pro-Con has been following developments in the transportation industry closely for several years and we feel having direct control of our logistics partners gives us the best chance for success. By using U Route's transportation management system (TMS), we can develop and maintain relationships with carriers and ensure that our direct relationship is significant enough so we will not be adversely affected by driver shortages that are short or long term.

Q: What tools do you use to manage your transportation? And what factors swayed your technology decision process?

MR: Four years ago, Pro-Con managed all freight activity with spreadsheets, phones, and emails. It became clear that with our growth and more than 20,000 annual shipments, we needed something more robust than email and spreadsheets.

We analyzed more than 40 commercially available TMS before selecting U Route. We carefully reviewed the functionality of each system and the ability for each platform to grow with our business. The fact that U Route is a web-based Software-as-a-Service and that it uses web services to obtain rates for our LTL and TL service providers meant that we would not be maintaining or loading rate tables. It was also critical that U Route would be able to easily interface with our ERP.

Q: Why does U Route focus on providing TMS directly to shippers?

JS: First, let me say that I am not anti-3PL or agnostic about the value they can provide. However, there are industries and companies that are better served by managing and controlling their own logistics. This has always been our why. We provide the best web-based transportation software to shippers that benefit from directly managing their own procurement and carriers.

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Vice President of
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Progressive Converting, Inc.

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Founder
U Route LLC

Managing Yard Work

By growing driver productivity, weeding out inefficiencies, trimming detention costs, and seeding visibility, yard management systems can fertilize your supply chain.

By Karen Kroll

f you think of the supply chain as a giant digital jigsaw puzzle, most organizations are missing a piece: a yard management system (YMS) that connects warehouse systems with transportation systems. This "operational blindness" can cost organizations both time and money, says Jeff Papadelis, senior partner with Yard Management Solutions, a YMS provider based in Suwanee, Ga.

While many companies have invested heavily in warehouse management systems in an effort to squeeze every ounce of efficiency from those operations, that's often not the case when it comes to truck and rail trailers and containers. In the yard, manual processes are still the norm, notes Michael Maris, senior director of transportation logistics with Zebra, a tracking technology and solutions provider based in Lincolnshire, Ill.

A yard management system can act as the link between a company's warehouse management system and transportation management system. It manages shipments and their containers from the yard gate to the dock. A YMS can provide real-time visibility to trailer location and contents. By doing so, a YMS can drive efficiencies, reduce detention fees, and improve decision-making.

That is the experience of Curtis Walker, the project leader of applications for Fresh Express, which produces and delivers fresh, packaged salads. The company implemented a YardView YMS solution "to improve communications between dispatchers and yard drivers," Walker says. This boosts efficiency, in part by eliminating the need for drivers to walk from the lot to the dispatch window for each assignment.

In addition, the report provides data such as trailer inventory and availability, "which is extremely useful for managing and ensuring that trailers are ready and on time," he adds.

Several components are key to a yard management system, says Eric Lamphier, senior director, product management for Atlanta-based Manhattan Associates, a provider of supply chain management software. These are:

- **Appointment scheduling.** The YMS should systemically track and organize inbound and outbound appointments to align labor capacity and minimize congestion.
- **Guard check-in and check-out.** The system should enable guards to check each trailer in or out, so it's clear who's in the yard, how long they've been there, and if they have permission to be there.
- **Yard management.** It should direct trailers to a specific location in the yard and track their movements to enable efficient retrieval and accountability.
- **Dock door management.** The YMS should direct assets to specific dock doors for unloading and loading, taking into account constraints such as loading/unloading sequences, and/or temperature requirements. For instance, if the contents need refrigeration, the truck should move to a door near that equipment.

YMS solutions provide carrier accountability by recording complete driver histories. A carrier tracking function offers immediate access to carrier arrival and departure performance history.

In 2011, a leading UK parcel delivery firm began using a YMS from Montreal-based C3 Solutions. "Before we implemented the YMS, we handled all of our yard management by sharing spreadsheets and maintaining whiteboards in the traffic office," recalls Jay Alexander, project manager, sort and transport, with the firm.

The manual process worked, but wasn't as efficient as it could have been. The firm maintains 1,200-plus trailers across three sites, and each site must manage about 500 movements each day into and out of the yard. That's in addition to several hundred daily moves within each yard.

The company began looking at YMS solutions that contained several attributes. To drive efficiency, the solution needed to provide visibility across all sites, and identify the location of each asset and its capacity to move within the site network.

The system also needed to apply business rules so that once a trailer hit the gate, the system would know what to do with it—for instance, direct trailers with palletized loads to doors with space to unload them, or direct trailers with loose loads to doors near cranes that could unload the products.

The company also wanted to eliminate the need for a worker to physically walk each yard to account for assets. This would enhance both productivity and safety.

Finally, the company wanted a solution to introduce a consistent process for checking and monitoring trailers entering and leaving the yard. "The YMS now provides conformity," Alexander says. "It enables us to drive standardization across the operation."

The system also has reduced detention costs—the charges levied when a trailer or container isn't unloaded within the agreed-upon time frame. In addition, employees no longer make phone calls to get a trailer moved. "The system makes those decisions," Alexander notes, and that has streamlined the process.

Why a YMS?

While yard management systems aren't as prevalent as warehouse management systems, they're becoming more mainstream. Companies recognize the savings these solutions can generate, allowing them to quickly recoup their initial investment. Users typically see a return on investment within six to nine months, according to several YMS providers.

How do YMS solutions allow companies to achieve ROI so quickly?

To start, switchers—the individuals who move trailers from the yard to dock doors—can spend nearly one-third of their time searching for trailers, Papadelis says. That wastes both time and money.

By tracking a company's assets, a

YMS can cut the detention charges incurred when a shipper fails to unload the trailer within the time window agreed upon with the carrier. These charges can hit $1,000 per day, says Aaron Lamkin, director of sales and marketing with Centennial, Colo.-based TrackX, which provides asset visibility and tracking software.

AAGEX Freight Group, based in Jacksonville, Fla., offers turnkey yard management solutions. Some customers have hundreds of trailers in their yard, but lack real-time visibility to them or their contents, says James Bagwell, senior vice president. AAGEX partners with Exotrac, a provider of real-time logistics management software, to provide that visibility. Once the companies have a better handle on the location of their assets, they know which ones to move to avoid fees.

Just as important as reducing fees, a YMS can keep a yard from becoming so disorganized that drivers can't get out on time. "Carriers don't want their drivers to be delayed," notes Greg Braun, senior vice president of sales and marketing with C3 Solutions.

Braun also notes the importance of the "chain of responsibility" when drivers are involved in accidents. While it would be a stretch to pin every delay, let alone any accident, on yard operations, it's a consideration. "It comes down to respecting drivers' time," he says.

A robust yard management system also can boost compliance with safety regulations. For instance, it can monitor pharmaceuticals as they travel from gate to warehouse, helping to ensure they remain within a sanitary, temperature-controlled environment.

A YMS also can help companies cut inventory levels, says Matt Yearling, chief executive officer with PINC, a provider of yard management systems based in Alameda, Calif. Some companies use trailers as extensions of their warehouses. Without a YMS, "it's an area that has no visibility," he says. That can lead companies to purchase more inventory than necessary, just to ensure a buffer.

In some cases, a YMS can trim labor costs. Lamkin provides one example: A company has four full-time drivers who

Exotrac's yard management system monitors inbound and outbound asset movement at multiple yards, ensuring key management personnel receive timely trailer condition and preventive maintenance exception reports.

work from 7 a.m. to 5 p.m., five days per week. However, from 7 a.m. to 9 a.m., the workload is light enough that two of the four drivers don't have much to do. The YMS can highlight the volume of work, and report that the yard only needs two workers during these hours. The other two can start work at 9 a.m.

The gate check-in and check-out processes incorporated within many YMS solutions allow organizations to harvest some C-TPAT (Customs-Trade Partnership Against Terrorism) information, says Jon Kuerschner, vice president of product management and consulting with Bloomington, Minn.-based HighJump, a supply chain management software provider. This information includes the driver's name, driver's license number, and the state of issuance. "You need this data to clear customs," he says.

A secured yard, in which all vehicles are checked in and out, also can provide key information if a security issue arises. "You have the data to show that Driver X arrived at noon and stayed six hours," Kuerschner adds.

Evolving Systems

Historically, much of the value yard management solutions provided had been improving the productivity of the drivers charged with moving trailers around the yard. Previously, drivers received instructions and messages over two-way radio. "Drivers could get mixed up in so many ways," Braun says. By using a YMS to communicate electronically, and applying algorithms to direct the sequence of tasks each driver should perform, their productivity could jump by 20 to 30 percent, he adds.

Today's yard management systems still handle these functions, and also are smarter and easier to install. Their algorithms can determine where and when each trailer should move, based on its contents.

Kuerschner previously worked with a furniture company that implemented HighJump's YMS. Originally, employees handled trailer moves across a large campus based on zoning and priority, without considering the trailer's physical proximity to the dock door. When the YMS provided the ability to make work queue decisions based on both priority and proximity, trailer moves across the network nearly doubled, from about four to eight per hour. "Once we cracked that code, the company experienced huge productivity gains," Kuerschner says.

The shift to cloud solutions that truck drivers can access via mobile devices has made yard management systems more affordable, and the interfaces between yard management solutions and other software systems more streamlined. "The cloud is making yard management easier," Maris says.

Some providers, such as Scottsdale, Ariz.-based JDA Software, offer YMS as a module within their warehouse management systems, says Matt Butler, director, solutions strategy for supply chain execution at JDA. The solutions share a database and common data schema, he adds.

An emerging area in YMS technology advances is the use of drones, which can eliminate the need for an individual to drive through the yard to take inventory. Drones tend to make the most sense in large, congested yards, or when the inventory or assets are of high value and the company needs an accurate, real-time understanding of that inventory. Some PINC customers are in pilot tests with drones, Yearling says.

Companies often use RFID technology to handle these tasks. HighJump, for instance, affixes an RFID tag to each truck. An antenna on the shunt truck reads each tag and triangulates its position to within several feet. "The system updates specific trailer location without human intervention," Kuerschner says.

Who Should Consider a YMS?

Given that yard management solutions have dropped in price and become easier to install, does that mean more companies should consider them?

Braun's rule of thumb is that organizations with two or more dedicated yard drivers should consider a YMS, rather than trying to manage assets with "two-way radios and clipboards," he says.

Nathan Harris, president of Yardview, offers another test: A supply chain

professional should be able to state the number of inbound trailers that entered the yard that day, week, and month, and identify the number of empty and loaded trailers in the yard at any given moment. "If managers can't answer key operational questions, it impacts the yard's efficiency," he says.

Several attributes are key to an effective YMS. Ease of use is one, says Conway Amar, vice president of Southern Freight, a truckload carrier serving the Southeast, Midwest, and West Coast. Even employees without technical training should be able to understand how to use the system. The system also should be easy to install and maintain.

Can You See Me Now?

Visibility is key. The system should identify what trailers arrived and at what time, and when they were loaded or unloaded, says Sean Romine, an Exotrac consultant. These metrics should tie to the facility's goals. For instance, if the goal is to unload inbound trailers within 24 hours, the system should indicate whether this is happening.

The YMS's business rules should allow it to prioritize assets, and determine which to move to a door first. For example, it typically would move the ones facing detention charges before those that aren't.

It also should offer "constituent-based appointment scheduling," Kuerschner says. That is, a carrier should be able to request dock time, either through EDI or a system portal. And, the check-in and check-out processes should be automated, so they don't create bottlenecks at the gate.

Real-world exception handling is another must-have. Say a driver tries to move a truck but finds the space occupied. The YMS should allow them to alert the system and find another space.

Over the next five years, yard management systems will become standard fare. Amar estimates that while 10 to 20 percent of organizations use a YMS today, "it will be 80 to 90 percent of companies in five years," he says. "YMS is not a new idea, but it's an idea whose time has come." ∎

5 YMS Must-Have Features

Shopping for a yard management system? Greg Braun, senior vice president, sales and marketing for C3 Solutions, recommends selecting best-of-breed systems that offer the following functionality:

1. **Real-time visibility to yard assets.** Visibility means a lot more than simply knowing where the trailers are parked. Sites also want to know the status of empty trailers, trailer types, visibility on when they arrived and left, and whether you're behind schedule on task execution.

2. **Yard driver task optimization.** Managing dedicated yard drivers is the most costly aspect of a yard operation and the most important in terms of the capacity to deliver service to the operations. A good yard management system should focus on eliminating trailer move/ tasks through combining move requests and optimizing each move to use the least amount of resources.

3. **Dock scheduling.** Unless your yard only manages drop loads (100 percent), optimizing throughput and overall yard capacity requires a dock scheduling system for the live inbound and outbound loads.

4. **Gatehouse management.** You can greatly improve gate efficiency by replacing the typical spreadsheets, manual logs, and phone calls with a simplified and streamlined process involving pre-arrival visibility, gate pass printing, and intelligent trailer putaway functions.

5. **Integration to external systems.** Integration to other information systems (TMS, WMS, and MRP) eliminates duplicate data entry, increases productivity, and maintains continuity between systems. It could also speed up some YMS processes, such as gate arrival check-in, and enhance visibility across your network.

Nice-to-Have Features

Dock management. A best-of-breed YMS should offer multiple options to efficiently manage dock doors. Intuitive monitoring screens to release trailers and door-turn reports allow your staff to be more productive and improve the flow of trailers.

Mobile applications. Mobile applications have the potential to enhance yard efficiencies and overall visibility. They allow warehouse and yard personnel to easily capture timestamps related to arrival, on dock and departure times, and yard drivers to receive clear instructions on a mobile touch-screen device.

Exception alerts. Having the ability to configure exception alerts to highlight time-sensitive events requiring your attention (e.g. idle shunter drivers, late arrivals/departures, refused shunter tasks, trailers sitting at door for too long) will contribute to achieving higher service levels at the site.

Operational reports. Report on key performance indicators such as driver productivity, gate activity, trailer status, time in yard, dock door usage, etc.

Trailer workshop management. Often neglected, a YMS should manage this aspect. Prioritize trailer repairs, automate trailer moves to and from the garage area, keep track of trailer inspection dates or user-reported defects to ensure that out-of-service trailers are handled properly.

YMS GUIDE

Ready to implement a YMS solution? These leading providers can help.

Vendor, URL	Solution	Licensed to use (installed locally)	Hosted on vendor website	Cloud based	Description	Real-time visibility to yard assets	Yard driver task optimization	Dock scheduling	Gatehouse management	Integration with external systems	Dock management	Mobile applications	Exception alerts	Operational reports	Trailer workshop management
4SIGHT Logistics Solution www.4sightsolution.com	4SIGHT	●	●	●	Utilizes RFID and GPS technology to provide accurate, real-time locating system information to increase visibility, productivity, and sustainability.	●	●	●	●	●	●	●	●	●	●
C3 Solutions www.c3solutions.com	C3 Yard			●	Best-of-breed web-based YMS allowing operations to optimize yard moves and improve gate and dock throughput.	●	●	●	●	●	●	●	●	●	●
Cypress Inland www.yardview.com	YardView			●	Easy to learn and simple to use for managing yard inventories, movements, appointments, drivers, carriers, time-related events, and other yard activities.	●	●	●	●	●	●	●	●	●	●
Descartes Systems Group www.descartes.com	Descartes Yard Management	●		●	Manages trailer movement and inventory; plans/tracks positions, arrivals, departures across distributed/centralized yards; records status, moves, inspections, security.	●			●	●	●	●		●	
DXC Technology www.dxc.com	DXC Technology YMS	●	●	●	A modern decision-support system built by integrating operational applications with technologies to provide real-time visibility into operations.	●	●	●	●	●	●	●	●	●	
Exotrac www.exotrac.com	YardTrac			●	A cloud-based, real-time yard management system that leverages mobile technology for a comprehensive solution through gate, yard, and dock.	●	●	●	●	●	●	●	●	●	
HighJump www.highjump.com	HighJump Yard Advantage	●		●	Provides centralized appointment scheduling, gate check in/out, real-time equipment/inventory/people visibility, and RF direction for yard moves.	●	●	●	●	●	●	●	●	●	
Inconso AG www.inconso.com	inconsoYMS	●			Includes total coverage of the gate entrance and exit, yard activities, as well as container management and slot management functions.	●	●	●	●	●	●	●			
JDA Software www.jda.com	JDA Yard Management Solution	●	●	●	Embedded as part of JDA's WMS, fully integrated to TMS. Provides visibility into yard inventory/assets/task execution/ performance tracking. Optimizes appointment management.	●	●	●	●	●					
Kuebix www.kuebix.com	Kuebix YMS			●	Provides asset visibility for yard and dock, work order optimization and management, gatehouse management, and KPI tracking.	●	●	●	●	●	●	●	●	●	
Made4net www.made4net.com	YardExpert	●	●	●	A scalable and flexible solution to manage and optimize gate and yard resources.	●		●			●	●	●	●	
Manhattan Associates www.manh.com	Yard Management	●		●	Enables planning, execution, tracking, and auditing based on shipment type, load configuration, labor requirements, and dock/warehouse capacity.	●	●				●		●	●	
One Network www.onenetwork.com	Yard Management	●	●	●	Lets users plan, execute, track, and audit loads based on critical characteristics like shipment type, load configuration, labor requirements, dock and warehouse capacity.	●	●	●	●	●	●	●	●	●	●
PINC www.pinc.com	Advanced Yard Management System	●	●	●	Helps users gain visibility, manage yards and network operations efficiently, and collaborate effectively with trading partners.	●	●	●	●	●	●	●	●	●	●
Sentier Systems Inc. www.yardcommander.com	Yard Commander			●	Fully functional but not overbuilt with seldom-used functions. Easy-to-use and affordably priced per site with no limit on users.	●			●			●		●	
TrackX www.trackx.com	TrackX Yard			●	An auto-ID technology-enabled YMS that combines automatic data collection with business rules and processes to automate workflows and increase efficiency.	●	●	●	●	●	●	●	●	●	
Transwide www.transwide.com	twSlot			●	Intuitive scheduling solution increases visibility and maintains even flows of vehicle traffic in the yard/facility, respecting resources and constraints.			●	●	●	●		●		
UltraShipTMS www.ultrashipmts.com	UltraYMS			●	Complete visibility, downstream reporting, asset control, communication and accountability using any wireless device over existing WiFi or 3G connections.	●	●	●	●	●	●	●	●	●	
Yard Management Solutions yardmanagementsolutions.com	Eagle Eye	●		●	Prioritizes shipments, increases throughput, reduces demurrage fees, maximizes asset utilization.	●					●	●		●	
Zebra Technologies www.zebra.com	Yard Management	●	●	●	Electronic asset tracking provides the visibility needed to minimize wait times, increase throughput, and reinforce regulations for a safe, secure, efficient, and productive yard.	●	●	●	●	●	●	●	●	●	●

THE MIGHTY PALLET

A SUPPLY CHAIN POWERHOUSE

The **workhorses** of the supply chain, recycled, repaired, and re-used pallets help shippers **save money** while getting the job done

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T he number of pallets used in the United States is expected to increase 1.9 percent annually through 2019, according to a recent Freedonia Group report. That growth will bring the total number of pallets in circulation to 2.6 billion.

Two factors fuel the increase. First, "expected increases in manufacturer shipments will be responsible for a large portion of rising pallet demand," says Kyle Peters, an analyst at Cleveland-based Freedonia. Second, "the need to replace pallet stocks, the quality of which declined following the recession, will also contribute to pallet demand gains," he adds.

The push to replace older pallets comes as more companies move away from requiring new, undamaged, or stained Grade A wood pallets to buying less-expensive Grade B units that have been repaired and refurbished.

"Distribution centers used to require Grade A pallets," says Lewis Levy, president of New Jersey-based third-party logistics (3PL) provider Burlington Development. "But that changed a few years ago when they didn't specifically say they'll take Grade B units, but did describe them in their routing guides."

"Many more companies are buying recycled pallets rather than new ones," agrees Glenn Meeks, director of sales and marketing for Bettaway Transportation Logistics and Pallet Systems, a full-service logistics company with headquarters in South Plainfield, N.J. "This means, though, that existing pallets in the system are getting more beat up. We have to keep repairing them."

With new wooden pallets priced at about $12 each, while used and repaired units cost closer to $6 (depending on the region), it makes sense to accept recycled units when possible.

"There's a cost associated with that pallet when it goes outside a shipper's supply chain and into the regional pallet pool, and companies look to minimize costs as much as possible," says Meeks.

STAYING IN THE LOOP

Plastic pallets, on the other hand, tend to move in a closed loop that brings them back to the original source.

"A plastic pallet, for example, might start at a manufacturing facility, move to a warehouse, then go to a retailer before it returns to the original manufacturing facility," says Ryan Roessler, pallet product manager at ORBIS Corporation, a pallet supplier in Oconomowoc, Wis. "But there's a system in place to make sure it does come back."

Levy has also seen a change in how wood pallets move through the supply chain. In the past, when a shipper delivered freight, it picked up an equal number of pallets so it was an even trade. As fuel prices rose, it didn't make sense to give up valuable cargo space to heavy empty pallets.

"Now, freight that arrives on a pallet leaves on the same pallet," says Sabrina Ragland, warehouse administrator at Logistics Plus Warehouse and Foreign Trade Zone, a Dallas 3PL.

"The pallet price is incorporated into the cost of the goods shipped, which makes it more affordable for the customer," says Meeks.

The wood pallet industry is regional; manufacturers are often family generational businesses providing pallets to customers in a surprisingly small footprint considering today's global economy.

"It's like Coke, which has bottling plants everywhere because the beverage is 99 percent water—why ship it when you can add the water anywhere?" says Brandon Stallard, CEO of TPS Logistics, a Michigan 3PL.

It doesn't make sense to build pallets on one side of the country and ship them empty to the other side, he notes. This local aspect means that some companies have several sources nearby while large manufacturers and shippers have many suppliers all over the country. Making sure they have enough pallets for the right price at the right facility and at the right time can become complicated and challenging without specialized help.

Companies such as Bettaway Transportation Logistics and Pallet Systems, ORBIS, and PECO Pallet help manage that process for companies by centralizing pallet sourcing, ordering, delivery, and tracking.

SEEING RED

Irvington, N.Y.-based PECO rents its distinctive red pallets to customers from a carefully monitored and controlled national network of more than 50 depots.

"We ensure the consistent quality of our pallet pool by sorting, inspecting, cleaning, and repairing pallets as needed every time they cycle through our depots," says Adrian Potgieter, senior vice president of sales. "Every unit must pass a rigorous, 15-point inspection before being reissued to customers."

To reinforce its reputation for having the most rigorous inspection standards in the pooled pallet industry, PECO recently revamped its inspection process, clarified expectations for quality audits, and implemented additional "no-knock" audits by third-party inspectors at all depots in its network.

Every PECO Pallet unit must pass a 15-point quality inspection before the company will reissue it to customers.

Because wooden pallets can be repaired, they're a cost-effective option for some shippers.

With sales, service, and operations teams located throughout North America, the company can respond quickly to any customer questions or issues. A common customer concern, says Potgieter, is pallet quality consistency, especially with the growing use of fast-moving automated equipment.

"We constantly work to ensure we provide customers with full loads of high-quality pallets that work smoothly in automated processing lines," says Potgieter.

A BETTER WAY

Bettaway manages pallet programs for manufacturers with several facilities in the United States. "We become their interface with pallet suppliers so that instead of working with 25 different vendors across the country, they work with us," says Meeks. "It simplifies the process while helping them save money."

Bettaway will work with multiple pallet vendors at one client site if the volume warrants it.

"It's a significant timesaver because a staffer at the facility isn't dealing with pallets—we have a dedicated employee doing it for them," Meeks says. "If one supplier can't deliver on time, we go to another that can. Turning that responsibility over to us lets the manufacturer focus on its core competency."

Because pallets are commodity products with pricing set by supply and demand, shippers often focus on price— sometimes to their detriment.

"Some companies stop using a vendor because they can get pallets for five cents less per unit from someone else, only to discover that the quality isn't as good or they can't get pallets when they need them," Meeks says.

"You don't want to make a purchase decision based on price alone," agrees Roessler. While plastic pallets might cost more upfront than their wood counterparts, they are often more cost-effective in the long term.

"Analyze your entire supply chain, determine your needs, and do a complete cost analysis that takes into account how many times you get your pallets back," Roessler suggests, adding that plastic's durability offers a longer lifespan.

Plastic is particularly well suited for situations where product safety or contamination are concerns because, unlike wood, plastic doesn't harbor bacteria. ORBIS's product line includes a one-piece molded pallet with no

A Pallet Primer

Some basic information to get you up to speed on pallets.

TERMS

Stringer pallet: This type of pallet has a strip of wood–a "stringer"–between its top and bottom decks. The decks are attached to the stringers. Notches are cut into the stringers for forklift entry.

Block pallet: The top and deck bottom boards are attached to blocks of wood–short supporting legs–instead of stringers.

2-way and 4-way pallets: With a 2-way, a forklift can enter the pallet only from two directions. In a stringer pallet without notches, a forklift can enter only from the two sides without stringers. Block pallets are 4-way, allowing forklift entry from all four sides.

SIZES

While custom sizes are an option, pallets are typically offered in two sizes:

GMA: The standard established by the Grocery Manufacturers Association (GMA) has a 48-inch by 40-inch surface.

Half pallet: Suitable for smaller retail spaces, half pallets measure 48 inches by 20 inches on the surface.

MATERIALS

Lumber: The majority of pallets are made of lumber because it's strong and can be repaired.

Plastic: This durable option, often used for food and pharmaceutical products, is most cost effective in closed-loop shipping situations.

Metal: Steel is often used for extremely heavy freight. Both steel and aluminum are often used when there's concern about product contamination or fire.

bettaway
pallets

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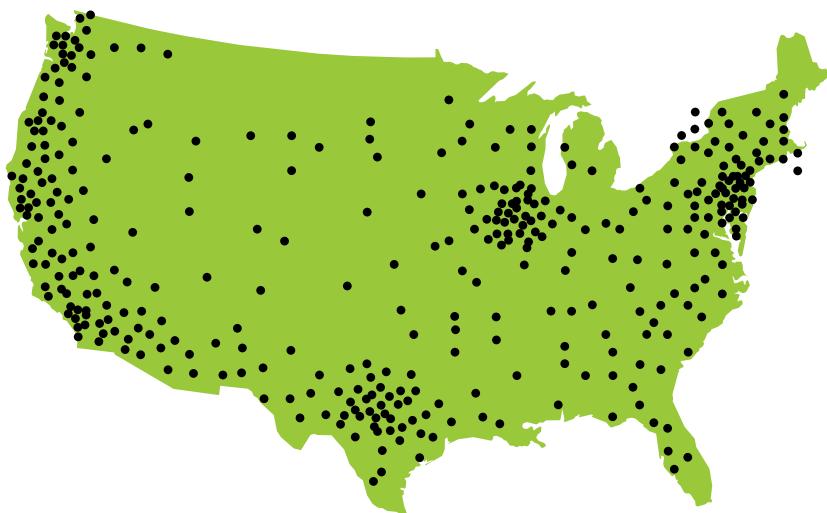
*Bettaway has developed one of the largest national pallet depot networks with **over 425 pallet yards throughout the US and Canada***

Supply
Centralized software analyzes pallet orders to find more effective supply options to meet customers' needs.

Retrieve
End users directly contact Bettaway service center to coordinate pallet pick-up and transport.

Repair
Service centers sort and repair all salvageable pallets, which are then placed back into inventory.

Reissue
Pallets are reissued from inventory for a fraction of the cost of new purchases, saving waste and money.

Partnering with Logistics

Our sister company is a nationally reputable transportation and logistics provider. As the inbound service provider to many end user facilities, we can utilize our delivering trucks to backhaul pallet returns. These partnered services ease the pallet process for our clients by eliminating multiple vendors and trucks, and lower transportation costs by allowing continuous pallet supply movement. It also gives us a huge logistical edge over the competition.

SmartWay℠ Transport Partner

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New Life For Old Pallets

Old pallets never die. They just fade away into new products.

An estimated 474 million pallets were recovered for recycling in 2011, according to Nature's Packaging, an industry resource group. Some entrepreneurs pull them from distribution center recycling bins to repair and re-sell, while others transform pallets into mulch, particleboard, or animal bedding.

Pallets have found new life as furniture, plant holders, shelves, and decorations. Some people even use sanded and painted wood pallets for in-home sign-making parties, while others sell decorative pallet signs on Etsy and elsewhere.

There's no end to a pallet's life when you remember that one person's trash is another person's treasure.

One-piece molded plastic pallets, such as those offered by ORBIS, are a popular solution for food companies. Plastic pallets are free of nooks or crannies where dust, dirt, and bacteria can accumulate.

nooks or crannies where dust, dirt, or bacteria can accumulate, making it a popular solution for food and pharma industries at greater risk for these issues.

Speedy delivery of a quality product is essential to Ragland, who says that about three-quarters of her freight comes into the warehouse on pallets. "I go to a pallet source that's dependable and can get me what I need—the same or next day," she says. Ragland typically orders 200 pallets at one time for customers about three times every year.

AROUND THE BLOCK

Potgieter sees a trend toward shippers preferring block pallets over the stringer type. Block pallets, he says, can hold more weight—up to 2,800 pounds—and are generally more durable. As a result, they can be reused more often. Because they allow forklift entry from all four sides of the pallet (some stringer pallets permit entry from just two sides), they

offer greater flexibility and efficiency when loading and unloading trucks. Because of their sturdy construction, large retailers such as Costco and Walmart often require block pallets, which can also be safely stored in overhead racks. Some stringer pallets are at greater risk of sagging.

MEETING GREEN GOALS

Shipper demand for products supporting sustainable supply chain goals is also a trend. It's one reason recycled and repaired pallets are popular. "Using recycled pallets helps companies meet sustainability goals," Meeks notes.

Using recyclable plastic pallets also helps with those goals. "The fact that we reclaim and recycle plastic pallets that can't be used anymore is important to customers concerned about their environmental footprint," says Roessler. ORBIS grinds up the plastic so it can be used in other products.

Roessler also notes an increased awareness of food safety in the supply chain. "The 2011 Food Safety Modernization Act—which impacts how food is grown, harvested, and processed—has made shippers more vigilant about contamination concerns," he says. "They can wash plastic pallets to help keep the food they carry safe."

As with most aspects of the supply chain today, the pallet industry often incorporates technology to help companies track freight and monitor pallet inventory. Roessler sees an increased use of pallet identification and tracking through RFID tags added to plastic pallets, an approach that works well with closed loops.

RED◇LINK™, PECO's proprietary online pallet management tool, enables customers to place orders, check delivery dates, view invoices, and generate reports. "By providing customers with easy access to the same

information we use, we can collaborate to manage pallet flows, identify problem areas, and find new ways to reduce costs," says Potgieter.

PECO also offers sophisticated analytical tools—including Roambi for mobile use and Tableau for visual reports—to provide real-time visibility for large companies managing complex networks.

GAINING INSIGHT THROUGH DATA

Bettaway works with customers to analyze the impact of reports that detail how many pallets move through a facility, total pallet volume, and changes in volume by location. The goal is to offer insights that can guide decision-making.

"For example, when data reflects patterns we recognize, we can share our experience with similar situations and suggest specific changes that can improve efficiency or save money," Meeks says.

Access to reports and analytics can be a deciding factor when partnering with a pallet rental or management resource, but it's important to take other parameters into account, too. Look for financial stability and industry longevity. "At the executive level, customers like that we have our own assets and delivery trucks," Meeks says. "But at the logistics level, they often look more at quality, service, and price."

Meeks encourages companies to work with a source that audits pallet depots to make sure quality is maintained, while Roessler stresses the importance of working with a supplier that evaluates your company's needs before making a recommendation.

"We want to see the facility so we understand your shipping loop and make an educated recommendation," he says. ORBIS offers a complimentary return-on-investment analysis.

"Looking at the entire supply chain is important," Roessler says. "If you're shipping from California to Virginia, for example, getting that plastic pallet back to California takes careful planning with your supply chain partners.

"But you get a good return on investment in closed loops, where you get more turns with a plastic pallet than you would from wood," he adds.

Potgieter advises shippers to ask specific questions when selecting a pallet provider.

"They need to determine if a prospective provider can deliver the quantity needed, when and where it's needed. Ask about on-time delivery rate. Learn more about their customer service approach," he says, adding that many businesses want 24/7 access to a service representative.

NEVER-ENDING JOURNEY

As the trend toward using recycled pallets instead of new units continues, whether for environmental or cost reasons, one thing is certain: Every pallet has been on an interesting journey from warehouse to warehouse and distribution center to distribution center.

"A lot has happened to that pallet," notes Ragland. "And every pallet has a story." ∎

Cosmetics Supply Chain Puts Its ~~BEST~~ Face Forward

Countless SKUs, fickle consumers, and multi-channel distribution drive cosmetics companies to take on a supply chain makeover.

By Sandra Beckwith

Rick Milligan discovered the impact that image, trends, and social media have on cosmetics brands during a trade show conversation with a representative of a hip cosmetics company that caters to teens and millennials.

The company, says Milligan, director of supply chain solutions at Inmar Inc., a Winston Salem, N.C.-based technology solutions provider, had a marketing agreement at the time with teen reality TV star and model Kylie Jenner. With her 100 million-plus social media followers, 19-year-old Jenner has serious clout with the makeup company's target market.

"'When Jenner says she hates a product on social media, the company can't give it away,' the representative said. But when she says she loves a product, they can't make it fast enough," Milligan says. "For example, they had one nail polish shade that was hardly selling until Jenner tweeted about how much she loved it—then it sold out in two days." Jenner has since launched her own makeup brand, Kylie Cosmetics.

The power of high-profile influencers such as Jenner, combined with consumer tastes that change as quickly as Lady Gaga's hair color, are just two factors that differentiate cosmetics supply chains from those of other consumer products categories. Cosmetics companies must also deal with multiple distribution channels that include online and brick-and-mortar stores, climate control and Food and Drug Administration (FDA) requirements for certain ingredients or products, and product disposal regulations that vary from state to state and often require special handling.

In addition, the cosmetics business is seasonal, with new collections introduced two or three times every year. With makeup in particular, products are manufactured in a wide range of colors or shades, so a plethora of SKUs is linked to any given product line. The products are also small, so they can't be handled the same way as other fashion-driven items such as apparel and shoes.

There's a lot at stake, too. The U.S. cosmetics industry was expected to exceed $62 billion in 2016, MarketLine reports, while U.S. prestige beauty products—high-end makeup, skin care, and fragrances—increased 7 percent in 2015 to $16 billion, according to the NPD Group.

"One of the biggest differences in the cosmetics business is the complexity of the market," says Karin Bursa, executive vice president of Logility, an Atlanta-based supply chain software solutions provider. "Consumers are comprised of different color spectrums, so the products serving them are produced in a wide variety of colors and shades, too."

Some product variations are also driven by seasons. There are different shades and product weights for different times of the year and for new collections.

Cosmetics also are subject to consumer preferences that can be hard to anticipate because they are often influenced by unpredictable tastemakers who include celebrities such as Jenner and her Kardashian sisters, as well as beauty bloggers such as Lisa Eldridge.

Put simply, cosmetics is an image-driven category in terms of what the end customer wants to project through product association, and the brand imagery that attracts those customers.

Forecasting the Future

One big supply chain challenge is making sure that the right product mix is available in the right distribution channels at the right time. It starts with forecasting the demand that will determine everything from ingredients purchasing to inventory to placement at retail locations.

Cosmetics forecasting takes into account historical sales of existing product lines, planned advertising and promotion, seasonality, syndicated data available on category or similar product sales, customer demographics, and, sometimes, intuition. Companies have to factor in regional differences, as well.

"Cosmetics companies often plan product assortments around specifics such as whether a region has more fair-haired or dark-skinned people," Bursa says.

A strong human element is involved in forecasting, too. "We derive a lot of intelligence from channel buyers," says industry consultant Sonia Summers, CEO of the Beauty Strategy Group and Beauty Barrage in southern California. "They tell us how many products they need based on their experience."

Summers also cautions against discounting intuition. "Forecasting is data plus some gut instinct," she adds. "That's how brands hit home runs."

There is a need for human talent in the mix. "Demand forecasting isn't defined only by software," says Jim Barnes, senior managing partner of Carmel, Ind.-based consulting firm enVista Corporation, which works with several major cosmetics brands, including Sephora. "You also need good sales operations, planning, and analysis processes in place."

At L'Oréal's Lancôme brand, the forecasting process is multi-faceted.

"It's important for us to become students of the market," says Courtney Armstrong, assistant vice president of demand planning for the luxury brand. "We work closely with the marketing department and talk frequently with the sales representatives who work with the retailers."

The brand's forecasters also monitor the social media accounts of influencers such as celebrities and top makeup artists, and stay current on trends the beauty blogs cover.

Forecasters blend this awareness with analytics from hard sales data and customer information that includes demographics and preferences acquired through its website. "It comes down to big data," Armstrong says.

One forecasting-related challenge that impacts all aspects of the supply chain is the time it takes to bring a new product to market. Product formulation is a complex process that involves sourcing and testing pigments and other ingredients that change as preferences for products change.

Forecasts can change during the one- to two-year development timeline that's typical for established, successful brands. "Lead times have a direct impact on forecasting accuracy," says Barnes. "If I can compress that lead time, I can improve that accuracy."

"Getting to the market faster is one of our biggest challenges," agrees Armstrong. "All partners in the supply chain are thinking about it."

Reading the Labels

Having a firm understanding of the formulation and manufacturing timeline is essential, because ingredients for some products are perishable and therefore have expiration dates. Some also need
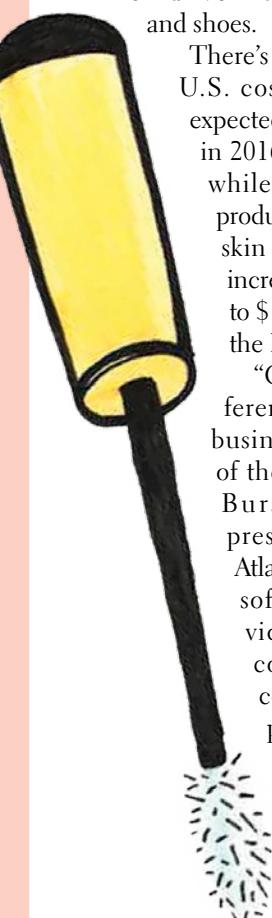
special handling to protect them from contamination.

"When we received one of our ingredients in a soiled box, we had to decide whether to use what was inside or wait three weeks for another shipment," says Kelly Barker, co-founder of PREP Cosmetics, a Texas-based skin care brand for girls. "That would delay manufacturing, but we also couldn't risk incorporating a contaminated ingredient."

So much care is taken with ingredients that sample supplier Chemical Marketing Concepts in Connecticut packages pigments, waxes, and stabilizers in a white room before sending them to manufacturers for use in trial formulations. When shipped in bulk for use in the final product, the company has to give extra care to the equipment it uses.

"Cosmetics ingredients often require temperature control and prior cargo restrictions," says Glenn Riggs, senior vice president of corporate logistics operations and strategy at Chemical Marketing's parent company,

Odyssey Logistics and Technology Corporation. "We even have to know what commodities were in the shipping containers previously. Cosmetics handling is specific and more challenging than other commodity products."

Larger brands often manufacture products going to multiple countries with different labeling requirements as well, so manufacturers have to make sure they comply with local government agencies.

In the United States, the FDA imposes requirements on companies that manufacture products categorized as over-the-counter (OTC) drugs. These include makeup and skin care products that promise sun protection. FDA-regulated cosmetics must also be stamped with an expiration date. The contracted manufacturer for PREP

Because cosmeceuticals like these anti-aging nail treatments from Dermelect Cosmeceuticals promise medicinal or drug-like benefits, they are regulated by the FDA and require temperature-controlled storage.

Because cosmetics products are small, they can't be handled in the same way as other fashion-driven items such as apparel and shoes.

Cosmetics stamps the date on the tubes holding the skin care products that contain sunscreen. OTC products must also be stored in a climate-controlled facility.

FDA compliance is particularly important to brands that are cosmeceuticals—a class of cosmetics with medicinal or drug-like benefits that include reducing the signs of aging on skin. Meeting FDA requirements requires a carefully controlled, monitored, and registered manufacturing environment. In addition, because these products have a limited shelf life, Dermelect Cosmeceuticals, a small, downstate New York-based brand, uses

a just-in-time manufacturing schedule.

"We try not to stock up on inventory so we don't have products sitting in the warehouse for long periods," says Amos Lavian, president. "Having just the right amount of products based on our forecast keeps them fresh and relevant."

Packaging Primer

REP Cosmetics, a small, specialized brand, applies that philosophy to packaging inventory, as well. Barker relies on a single trusted vendor for the boxes that hold her company's tube products. That puts that piece of the supply chain at risk if there's a problem with the manufacturer, but it's a risk she has to live with.

"I'd like to have another carton company in my back pocket, but maintaining a backup inventory of 25,000 cartons just ties up our money in boxes sitting empty in a warehouse," she says.

Still, packaging is such a key component of the company's supply chain that Barker stopped buying tubes from China—"China does tubes really well," she points out—and shifted to a supplier in neighboring Mexico. Production problems in China and a port strike at one point made it impossible to get

the tubes when needed, so working with a supplier on the same continent makes sense.

Packaging was the bottleneck several years ago when Dan Avila, senior vice president of customer solutions at Kentucky consulting firm LeanCor Supply Chain Group, worked on a project with an edgy cosmetics brand while at another firm. Targeting millennials with provocative product and shade names, the brand's unusual and complicated packaging was as much a part of the product as its pigments and textures. Repeated creative changes often meant that the packaging wasn't done in time to get products into retail store displays timed to special promotions.

"The company needed a disciplined product development process with toll-gates that were completed steps; you didn't go through the tollgate until certain things were done," Avila explains. "Then, once the approved design was sent to the packaging manufacturer, there would be no more changes." With this problem solved, a global cosmetics manufacturer later acquired the brand.

Packaging for shipping is also a key supply chain element, as Barker learned through the company's e-commerce sales. By shifting from an 8-inch by 6-inch by 4-inch box to one that's 6-inch by 6-inch by 3-inch, the company saved one ounce and eight cents on every shipment.

MacFarlane Packaging, the largest protective packaging distributor in the United Kingdom, works with cosmetic company clients selling online to ensure that they have the right packaging configuration for e-commerce fulfillment. That requires evaluating a company's picking and packing area and order configurations to make sure the right packing box and envelope selections are on hand.

"These operations have to get products out the door quickly, especially during the holidays, so we determine what packaging options help them do that while protecting the brand experience," says Laurel Granville, MacFarlane's marketing manager.

To maximize fulfillment center space, MacFarlane holds client

MacFarlane Packaging stores packaging supplies ranging from boxes to strapping tape to the protective paper shown here, delivering only what's needed to customers daily.

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packaging inventory, delivering only what's needed daily from one of its 26 warehouses throughout the UK. Supplies ranging from boxes to strapping tape to tissue paper are never more than one hour from any of its clients.

Cosmetics products are also significantly smaller than many other consumer goods, so cartons holding bulk products are both lighter and smaller.

"The general trend in the cosmetics industry is shipping smaller orders more frequently to stores or distribution centers. Even large orders don't take much space," says Eric Lamphier, senior director, product management, at Manhattan Associates, an Atlanta-based supply chain commerce software solutions provider. What's shipped to a distribution center or store might require just a few cardboard boxes. Because of that, shipping is often on the small parcel level, he notes.

Complex Channels

Stores selling cosmetics range from specialty retailers such as Sephora and Ulta to department and big box stores and drugstores. Many of these retailers also sell online. Cosmeceutical brands such as Dermelect are also sold in catalogs, doctor's offices, and spas.

At the same time, brands that distribute to retailers such as Sephora, which have brick-and-mortar stores plus strong e-commerce platforms, are also selling one or two products at a time directly to consumers from their own websites.

"There's an increasing amount of e-commerce and drop ship activity," says Lamphier. "Shipping channels are becoming increasingly complex."

"Guidelines for every retailer are different, too," adds Summers. "Some want orders all packed together while others want them in individual boxes. Mistakes can cost brands money."

Cosmetics retailers return products to manufacturers, too, making reverse logistics an integral part of the supply chain. Inmar, with its 27 regional return centers, processes products that don't sell or are returned for other reasons.

Branding: More Than A Pretty Package

MacFarlane Packaging, the largest protective packaging distributor in the United Kingdom, noticed that more and more e-commerce customers were videotaping themselves opening–"unboxing"–their packages and posting the videos on social media.

Knowing that image is important to many consumer products, but especially to cosmetics brands, the company ordered 119 packages online to study their packaging. Here's what it discovered:

- 61 percent had no branding inside or out
- 55 percent didn't reflect the brand's value
- 41 percent used too much packaging
- 19 percent used too little packaging
- 30 percent of the packages weren't a good fit for the product
- 10 percent of the products arrived damaged
- 55 percent had no returns information

About 95 percent of cosmetics products that are returned end up being liquidated, according to Curtis Greve, Inmar's vice president of liquidation. That's usually because of changes in consumer preferences, store re-sets that involve replacing current inventory with newer items, or an oversell to a retailer.

"Sometimes, the manufacturer encourages the retailer to take more product than the retailer wants," Greve notes. "They might negotiate a compromise that involves giving the retailer the option to return anything over an agreed volume level that doesn't sell."

Inmar is often responsible for keeping that excess inventory out of primary retail channels by selling it to secondary market retail chains.

Returned products might also be shipped back to manufacturers or destroyed. Destroying cosmetics requires special care because many ingredients, particularly those in nail polish and hair coloring products, are considered hazardous materials. Inmar has developed proprietary software that assesses products and separates them according to whether or not they're hazardous. Inmar also takes state regulations, which vary, into account.

"We waste-categorize, process, handle, and dispose of products properly according to local, state, and federal guidelines," says Inmar's Milligan. "This protects manufacturers and retailers from making mistakes, which is important because the fines for disposing of hazardous products incorrectly are steep."

Beauty trendsetters help reverse logistics providers such as Inmar stay in business while they nudge manufacturers to either give certain products more marketing support or develop new ones to meet demands. Whether it's British model Cara Delevingne, whose thick eyebrows encouraged an entire generation to invest in eyebrow pencils, or Beyoncé's makeup artist Sir John using Instagram to show how he transforms Queen Bee, these role models, and others like them, keep manufacturers focused on their supply chains while keeping consumers beautiful. ∎

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Customized App Puts Bat Distributor in the Big Leagues

When an ill-fitting bat ended former pro baseball player Pete Tucci's career, he founded Tucci Lumber Company, which manufactures and distributes baseball bats used by both the professional and amateur leagues. A paper-based order management system hampered the Norwalk, Conn.-based company's growth in its early years. But the company has since adopted a low-code development platform that digitized the manufacturing, distribution, and financial systems and led to out-of-the-park growth.

Pete Tucci was a Toronto Blue Jays first-round draft pick and he played in their system for several years until a hand injury ended his career. The injury, caused by a wrong-size bat, inspired Tucci to design his own line of customizable bats.

Right after leaving baseball, Tucci opened a heating and air conditioning business. But his heart was still with baseball, so his wife bought him a lathe to begin making his own bats.

When Tucci was still playing, he had experimented with rubbing his team-issued, standard bats to draw out more power. He discovered that this burnishing process compressed the wood, making for a harder surface and causing balls to pop off the bat at higher speeds.

Today, each Tucci bat is rubbed or burnished with a metal rod to compress the wood. That step adds about four minutes to the production time for each bat, but Tucci considers it core to his brand.

Founded in 2009, Tucci Lumber is now the fourth-largest supplier of bats to Major League Baseball, one of 36 companies approved to provide bats to

When a paper-based process slowed a baseball bat distributor's growth, the company took a swing at a digitized system, and hit a home run.

Tucci bats can be painted a variety of colors to create a custom look.

the league. Overall, the company ships 20,000 bats annually, competing against giants such as Mizuno, Rawlings, and Louisville Slugger, which ships nearly 2 million bats every year. Tucci also sells a line of customizable gloves and branded apparel.

Seven employees serve a customer base that ranges from individuals to Major League teams, as well as retail stores, wholesale distributors, and e-commerce customers.

Making It to the Big Leagues

Thanks to his pro connections, Tucci started selling to the top of the baseball pyramid and is now expanding distribution to the amateur level at colleges, schools, and recreational leagues. As a small, boutique supplier, Tucci can tweak bat designs and finishes for finicky big leaguers.

"Our bats are already known by major leaguers more than anyone else. Now, we want to build brand awareness around the amateur side of the business," Tucci says. "We started at the top, and our goal is to work our way down the marketplace."

When Tucci started the business, he used PC-based software to track manufacturing processes and inventory management, but the systems were not integrated. So the company used a paper-based order system to track each bat through the process.

"Each order flowed through the

system on paper containing the shipping address. The same information would also be in a front-end system but there was no link between the two," Tucci explains. "There was a lot of manual tracking on a single sheet of paper."

The problem was, there was no way to track orders through the production and shipping process, or create management reports. "At times, we didn't even realize an order was missing until someone called looking for it, simply because a piece of paper was misplaced," Tucci says.

Also, the siloed PC system was constantly overrun with viruses and phishing attacks that hampered productivity and risked the business.

Customized Solution On Deck

When production was approximately 30 bats per day, a paper-based system might have been manageable. But, when production rose to more than 100 bats daily, it became clear the lack of a comprehensive system was holding the company back.

In 2014, Tucci began looking for an easy-to-use system that could support his operation from order intake through shipping, manage invoices, and provide the reports he needed to grow the business.

After a friend recommended FileMaker—an Apple subsidiary that creates custom apps—Tucci found it suited his specific business needs in a way off-the-shelf solutions did not. He made the switch to Mac products and FileMaker, and implemented an iPad app.

"We made the switch because it was impossible to keep track of production and orders without misplacing a piece of paper," Tucci says. "The process is definitely a lot better now and we're able to grow with the system."

FileMaker is a low-code customizable application development platform. Forrester defines a low-code platform as one that "enables rapid delivery of business applications with

a minimum of hand-coding and a low upfront investment in setup, training, and deployment."

Tucci worked with a contract programmer to develop customized applications that allow his team to track order status across departments—from order intake to bat specifications to carving, painting, engraving, and shipping.

The FileMaker system is connected to the FedEx shipment manager system. Tucci's shipping department uses FileMaker to initiate shipments. Then the system automatically sends an email to the customer. An invoice is sent to any customer set up for that payment method.

"Wholesale customers, such as the Major League Baseball teams, get billed when the order ships," Tucci says. "The system automatically generates and emails the invoice at the same time the bats ship."

There's still one production step that Tucci would like to automate further, but it's out of his hands. Each bat that is produced for use in Major League Baseball must be entered into the league's database. Tucci has to submit dimensions—such as the weight of the billet and the size of the handle and barrel.

Lathe operators plug the bat's specs into the system and can generate a report, but then they must manually enter the data into the MLB system. "The specs are keyed in one at a time for each bat," Tucci says.

A Base Hit

The Tucci Lumber story is a common one for FileMaker implementation, says Ann Monroe, vice president of worldwide marketing for FileMaker. Typically a company is looking for a solution to a specific problem, such as inventory control.

"Inventory management is often a starting point because it is tangible. People see that they have a problem that needs to be fixed, and that often expands into solving other problems,"

Monroe says. "They can keep adding different steps to the workflow."

FileMaker users can build applications in-house or outsource development to one of more than 1,000 certified FileMaker business partners. That makes a custom application more affordable and easier to implement for small and mid-sized businesses than an off-the-shelf solution. The applications can be developed to support current processes rather than forcing processes to fit a certain model.

"We want the technology to work for you, not for you to work for the technology," Monroe says. "Business managers can consider how employees would use the system, and call on their own subject matter expertise to solve the problem in a way that's best for the team."

In its 2017 *State of the Custom App Report*, FileMaker found that

46 percent of custom applications were up and running in less than four weeks, and 71 percent of apps took less than three months to implement. Slightly more than half of FileMaker users (52 percent) are companies with fewer than 100 employees.

Pay for What You Need

"Companies often find that packaged solutions are either too small and don't do everything that needs to be done or too big with all the cost that goes along with the bells and whistles," Monroe says.

That's one aspect that Tucci values about FileMaker. "From a small business standpoint, you can pay for what you need and not for what you don't," he says. "And you can customize it along the way."

With FileMaker in place at Tucci Lumber, production is up to about

160 bats daily and productivity is up by 45 percent. Information no longer gets lost as the company handles orders ranging from a single bat to full pallets. All the employees use FileMaker in some way, some on the production side and some on the front end.

It's routine to ask the programmer to create additional reports that are easy to use. "All we have to do is click a button and the system runs the report," Tucci says. "That makes it a lot easier on my end because I don't know how to code."

One thing Tucci values most about FileMaker is the ability to continually tweak and customize the applications.

"The system feels like a living, breathing thing," Tucci says. "We can change the program on the fly to adjust to new business conditions, and that makes our lives easier."

Batter up! ∎

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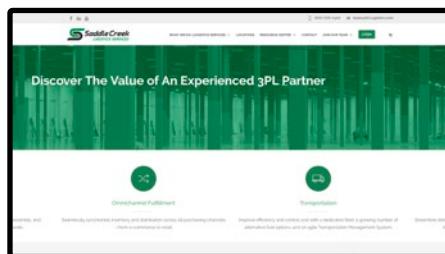
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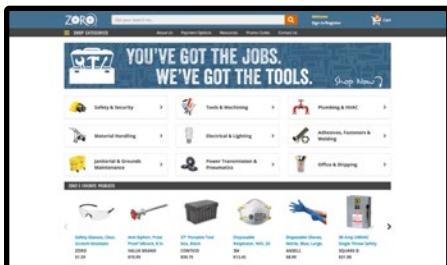
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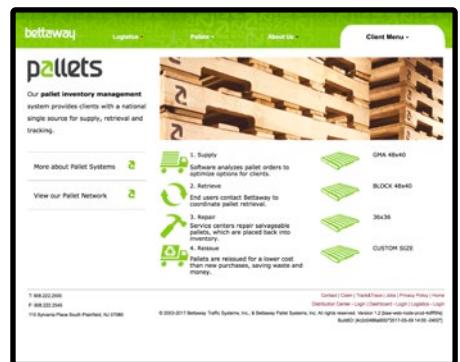
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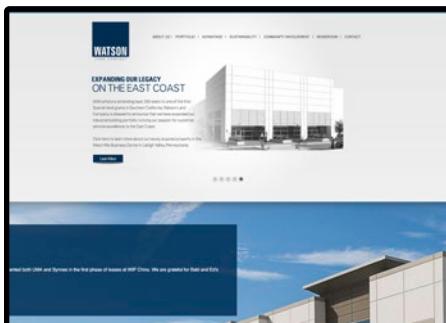
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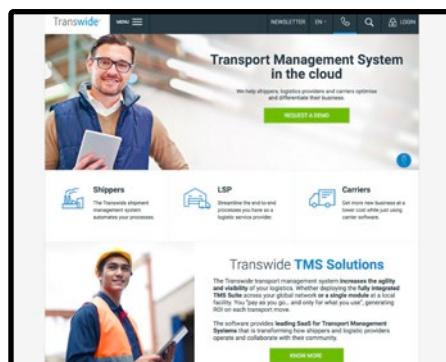
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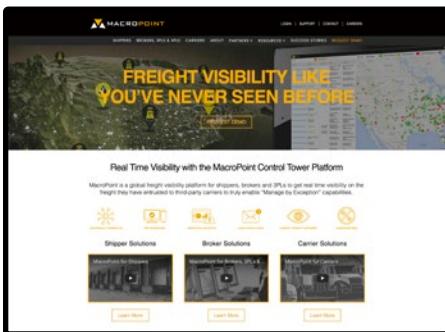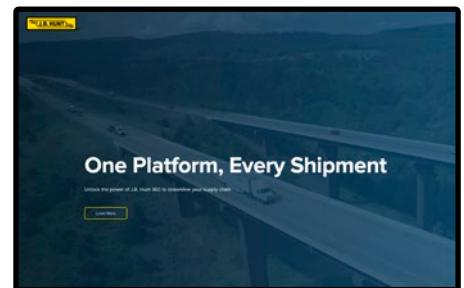
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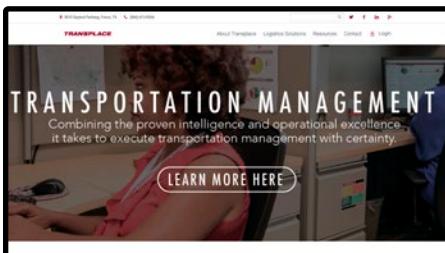
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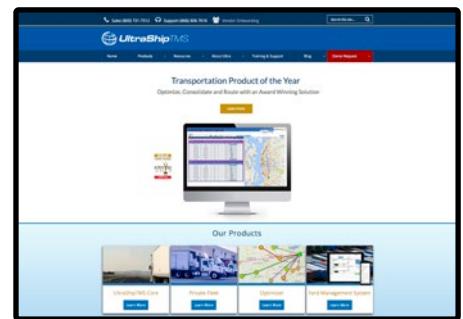
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As a division of Hub Group, Unyson specializes in elevating supply chain performance by using industry-leading practices, experienced professionals and state-of-the-art technology. We provide management solutions that support your strategic initiatives and deliver the results you need while guaranteeing supply chain savings and service levels.

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Approved Freight Forwarders ● www.approvedforwarders.com

Since 1991, Approved has been dedicated to the unique shipping needs of the Hawaii and Guam trades, and provides freight forwarding throughout the mainland U.S. Approved accommodates all types of commodities and all sizes of freight. Its highly trained logistics experts use advanced technology to tailor shipping solutions that fit your specific requirements. Approved works hard to ensure that your shipment arrives on time and intact, and keeps you updated every step of the way. To learn more about Approved's freight and logistics solutions, sailing schedules, and competitive rates, visit the website.
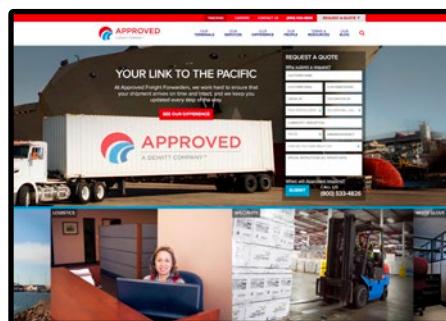
ArcBest ● www.arcb.com

"We'll Find a Way" is a testament of what our customers say about us. We say "yes" more often; we're the kind of company that partners with them to problem-solve and make things happen. In short, we do the hard things well. We'll Find a Way—has some grit to it; it speaks to the can-do attitude and relentless will of our people to get things done. It represents the heart and soul of the ArcBest family. When others say, "We can't," ArcBest companies find a way.

Capacity LLC ● www.capacityllc.com

Whether it's developing delivery solutions for local startups or international shipping for global brands, preparing EDI integration for household name vendors or packaging for luxury brand beauty products, there's little in the supply chain industry that the Capacity team has not done or seen. With its investment in technology, responsive team, and process-based approach to order fulfillment, Capacity has all the elements to become your ideal fulfillment partner.
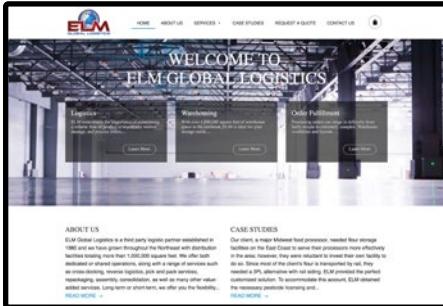
ELM Global Logistics • www.elmlogistics.com

ELM Global Logistics is a rail-served third-party logistics provider of warehouse and distribution services with locations in New York and Pennsylvania operating from one million square feet. The range of services includes pick/pack, cross-docking, repackaging, kitting, assembly, reverse logistics, and web access to inventory. All ELM facilities are supported with world-class supply chain management software solutions, which enable clients to readily engage in the e-commerce and business collaboration initiatives required today.

KINEXO • www.gokinexo.com

Formerly known as International Traders, Inc. & First American Carriers, Inc., (ITI & FAC), KINEXO strategically propels companies forward by providing highly customized supply chain solutions that are proven to reduce costs, increase transactional visibility and maximize operating efficiency. Part of the Berkshire Hathaway portfolio of companies, KINEXO's vast experience has led them to become one of the most trusted partners in supply chain management. For more information, visit gokinexo.com.

Lynden • www.lynden.com

Over land, on the water, in the air—or in any combination—Lynden has been helping customers solve transportation problems for almost a century. Operating in such challenging areas as Alaska, Western Canada and Russia, as well as other areas around the globe, Lynden has built a reputation of superior service to diverse industries.

NFI Industries • www.nfiindustries.com

NFI is a supply chain management provider offering dedicated fleets, logistics, distribution, warehousing, intermodal, global, commercial and industrial real estate, consulting, transportation brokerage, and solar services across the U.S. and Canada. NFI owns facilities nationwide and globally, more than 2,000 tractors, and more than 7,000 trailers. Privately held by one family since its inception in 1932, NFI operates 20+ million square feet of warehouse and distribution space, and generates more than $1 billion in revenue annually. NFI is an EPA Smartway Transport and WasteWise Partner and is dedicated to increasing energy efficiency and reducing the impact of the freight industry upon the environment.
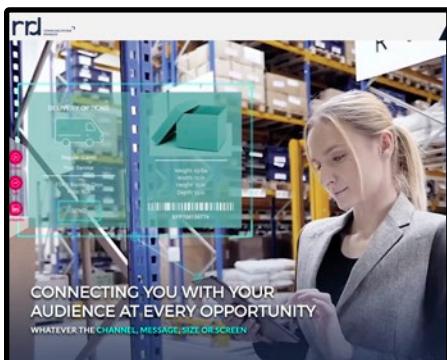
RR Donnelley's DLS Worldwide • www.rrd.com

Experience the benefits that only come from working with a major, global shipper that is also a top-ranked 3PL. We offer multiple transportation modes, an established multi-carrier network, volume-leveraged rates and service levels, along with technology-enabled systems and processes. Visit our website and contact us today to see why customers have relied on us for nearly 150 years.

SEKO • www.sekologistics.com

SEKO prides itself on a commitment to customer service, whether it's a 2 a.m. pickup for a critical industrial part for a plant that is 4,000 miles away, or the cost savings achieved from proactive communication with your vendors overseas. SEKO offices have the knowledge and expertise to expedite or to consolidate, depending on your need. From Hong Kong to Amsterdam, SEKO knows how to serve its clients. As a non-asset-based third-party logistics provider, SEKO has the flexibility to meet your supply chain needs using a variety of modes and carriers.
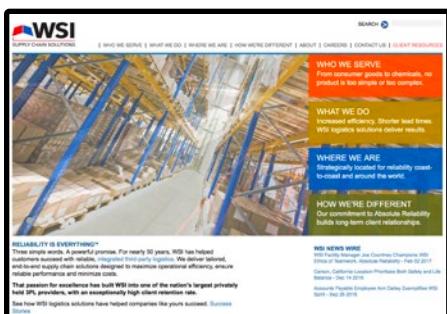
WSI (Warehouse Specialists, LLC) • www.wsinc.com

Reliability is everything. At WSI, that has been our approach to integrated logistics and supply chain solutions for more than 40 years. Our promise of Condition, Count & Time ensures accurate, timely, and sound performance—every time. Recognized as one of the top 3PL companies in North America, WSI delivers custom solutions for warehousing/distribution, fulfillment, transportation, import/export, information technology, and customer support services. Depend on WSI for increased efficiency, reduced costs, and absolute reliability.

WMS

Highway 905 • www.highway905.com

Highway 905 is a cloud-based supply chain execution solution provider focused on "personalization" and faster time to market. We enable you to: ensure cost reductions and maintain an error-free warehouse; deliver differentiated customer experiences with the power of real-time visibility and actionable insights; simplify your last mile; and reduce paperwork hassles with automated freight payments and digitized document processing. If you are looking for a solution that adapts to your business, and not the other way around, call us at 908-874-4867 or visit: www.highway905.com

WhitePaperDigest

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.

enVista

TITLE: *Why Now is the Time for a TMS*

DOWNLOAD: *http://bit.ly/enVista_TMS*

SUMMARY: Deploying a Transportation Management System (TMS) can provide many benefits—including improved transportation planning, increased execution accuracy, and greater shipment visibility—as companies seek to optimize their shipping management. Read enVista's whitepaper to find out why now is the time for a TMS.

Unyson Logistics

TITLE: *Global Visibility Through a Network Control Tower*

DOWNLOAD: *http://bit.ly/Unyson_ControlTower*

SUMMARY: In an industry where many logistics providers claim to deliver global visibility, the service frequently delivers little value to the shipper and little else to distinguish the provider from the services rendered within a standard TMS. In this whitepaper, you'll discover the process of implementing a control tower, its benefits and common pitfalls to avoid.
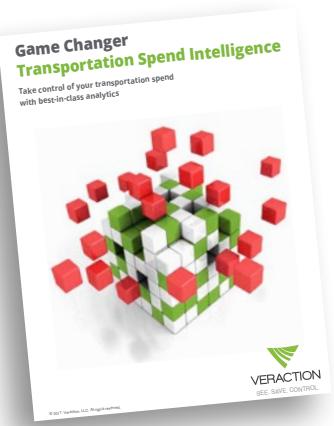
Veraction

TITLE: *Game Changer – Transportation Spend Intelligence*

DOWNLOAD: *http://bit.ly/Veraction_Gamechanger*

SUMMARY: Best-in-class analytics can transform transportation cost data into an advantage for any company. Analytics can eliminate the pain involved with managing raw transportation data and converting it into actionable intelligence—reducing the time required to produce analyses or take action. But with such promise comes hype, making it difficult to distinguish between solutions. In this whitepaper, you'll learn what a best-in-class transportation spend analytics solution should deliver.
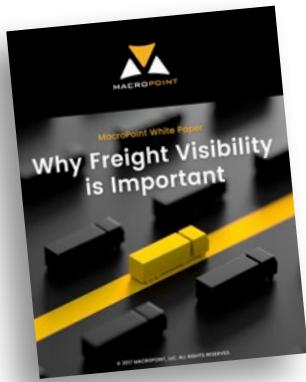
MacroPoint

TITLE: *Why Freight Visibility is Important*

DOWNLOAD: *http://bit.ly/Macropoint_Visibility*

SUMMARY: The global supply chain is always moving, but when it isn't, it is everyone's problem. Goods in various stages must be transported to and from raw materials suppliers, manufacturers, wholesale distributors, retailers, and end users. One hiccup can affect everyone in the logistics sector, thus the term "supply chain". Download this whitepaper to learn the consequences of late loads, undeniable importance of freight visibility, how real-time visibility enables exception management, and what to look for in a visibility partner.
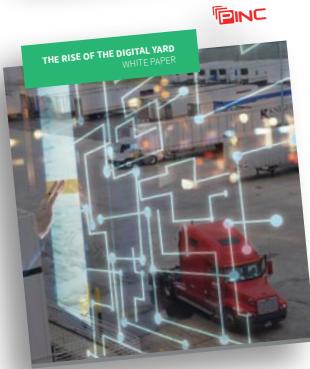
PINC Solutions

TITLE: *The Rise of the Digital Yard*

DOWNLOAD: *http://bit.ly/PINC_DigitalYard*

SUMMARY: Is your yard ready to join the digital revolution? With the millions of trailers nationwide sitting idle and unhooked 80 percent of the time, it's time to take the yard out of the dark ages and into the digital world. What are digital yards? What does the digital yard mean to the entire supply chain? How do you build the business case and get started? Explore these questions and more in this new whitepaper.

Purolator

TITLE: *Facilitating the U.S.-Canada Border Clearance Process*

DOWNLOAD: *http://bit.ly/Purolator_Clearance*

SUMMARY: Do your shipments arrive at the Canadian border eligible for expedited review, with all documentation pre-filed and duties and taxes paid? Or do they go to the end of the line and wait? And wait. Clearing goods through the U.S.-Canadian customs process can be confusing and time-consuming. But, several opportunities exist to facilitate the process, which can significantly reduce clearance times and associated costs. This new whitepaper examines several ways in which U.S. businesses, through their experienced logistics providers, are taking charge of customs clearance.
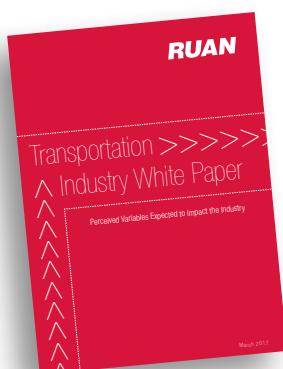
Ruan

TITLE: *Transportation Industry White Paper*

DOWNLOAD: *http://bit.ly/Ruan_Transportation*

SUMMARY: This publication addresses issues facing the transportation industry now and into the future. It is important to consider the impact of these issues and proactively develop strategic plans as a means of progressing forward and mitigating risk. The paper discusses perceived risks within three distinct areas of interest: the economic environment, industry trends, and government regulations.
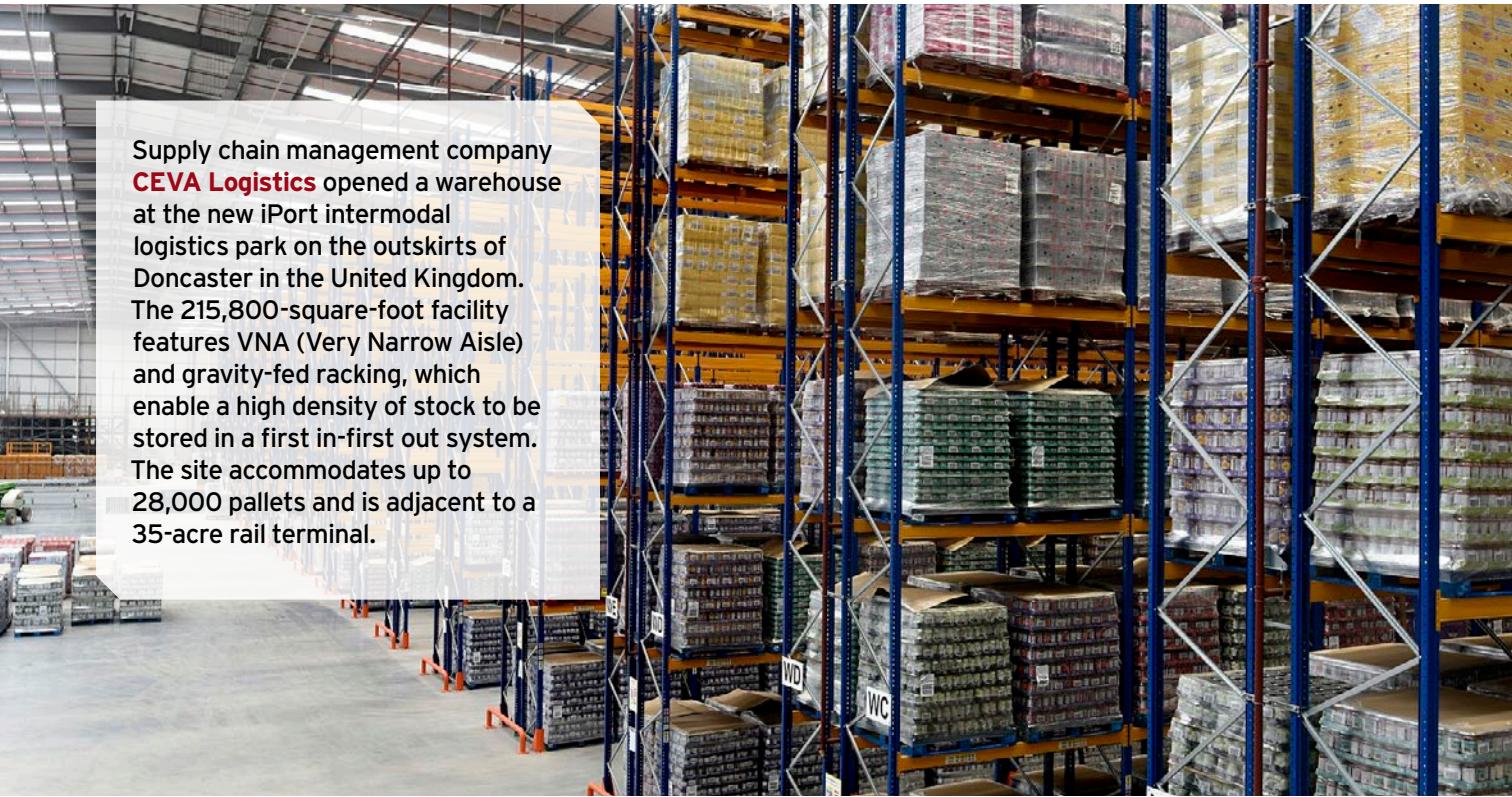
Supply chain management company **CEVA Logistics** opened a warehouse at the new iPort intermodal logistics park on the outskirts of Doncaster in the United Kingdom. The 215,800-square-foot facility features VNA (Very Narrow Aisle) and gravity-fed racking, which enable a high density of stock to be stored in a first in-first out system. The site accommodates up to 28,000 pallets and is adjacent to a 35-acre rail terminal.

// Services //

E-paper display technology developer **E Ink**, semiconductor distributor **Ineltek**, and mobile services company **Hanhaa** unveiled ParceLive, a low-cost tracking service that allows shippers to access data on the location, condition, and security of their packages anywhere in the world in real time. The tracker displays multiple messages throughout different stages of shipment. E Ink's e-paper display module enables the LiPo battery-powered ParceLive tag to operate for several weeks.

UPS added origin labeling capability to UPS Trade Direct Air and Ocean services for shippers looking to speed transportation of goods from Asia. The UPS Trade Direct solution allows importers and manufacturers to bypass distribution centers by adding the final destination label to individual packages for immediate last-mile delivery. UPS Trade Direct tools consolidate international freight, air, ocean and ground transportation, customs clearance, and direct delivery to multiple addresses within the destination country.

Estes Express Lines established a direct service to and from Canada, picking up and delivering Canada shipments on its own freight bill. To enable direct service, Estes Express Lines teamed up with Canada agents Speedy Transport and Pacific Coast Express—an alliance that went into effect in May 2017. Estes Canada shippers work with Estes Express Lines from pickup to delivery, and all freight is delivered on an Estes delivery receipt.

WMS solutions provider **PathGuide Technologies** enhanced its flagship product, *Latitude*, to include customer-specific packing slips and bulk order management. The upgrade provides shippers with more metrics tools, including summary scorecards for employees, employee groups, and the company. The bulk management enhancement features new functions to review and manage sales orders in bulk, and change route, stop, and priority.

Less-than-truckload (LTL), non-asset truckload, and logistic services provider **Saia** and **TST Overland Express**, a subsidiary of TFI International, formed an exclusive partnership to serve both companies' U.S.-Canada cross-border LTL customers. Saia now services TST Overland's LTL freight entering the United States, and TST Overland services Saia's LTL freight entering Canada.

//Transportation //

CMA CGM now offers an additional German port of call–the JadeWeserPort in Wilhelmshaven– as part of its FAL 5 service, which connects Germany with Singapore and China. As part of the new OCEAN Alliance, CMA CGM provides shippers improved transit times via three German ports of call, which are connected to the European hinterland via intermodal solutions.

Ocean transport company **Spliethoff** extended its Medliner service by adding a stop in Veracruz, Mexico. In addition to regular direct calls in Gemlik, Izmir/Gulluk (Turkey), Monfalcone, Porto Marghera, and Genoa (Italy) to Port Everglades, New Orleans, and Houston, the service now includes two sailings per month to Veracruz.

AirBridgeCargo Airlines expanded its Asia Pacific network by adding twice-weekly Boeing 747 freighter services to Taipei. The new service to Taipei operates from Moscow Sheremetyevo every Wednesday and Saturday, returning via Hanoi in Vietnam, and enables AirBridgeCargo to link Taipei with its network of destinations in the Middle East, Europe, and the United States for imports and exports.

American Airlines Cargo began a daily, nonstop widebody service between San Juan Luis Muñoz Marín Airport in Puerto Rico and Philadelphia International Airport, where American Airlines Cargo's dedicated 25,000-square-foot pharmaceutical facility is located. The new daily Airbus A330-200 widebody route further links the two pharmaceutical hubs and is an addition to the two daily narrow-body flights already in operation.

Container transportation, logistics, and terminal company **OOCL** launched an additional Intra-Europe service: North Europe-Turkey (NET). The new service operates with four vessels in the following port rotation: Felixstowe (England), Hamburg, Antwerp, Piraeus, Istanbul, Izmit, Izmir, Salerno, and back to Felixstowe. The NET provides a fixed-day, weekly direct service from North Europe to Turkey.
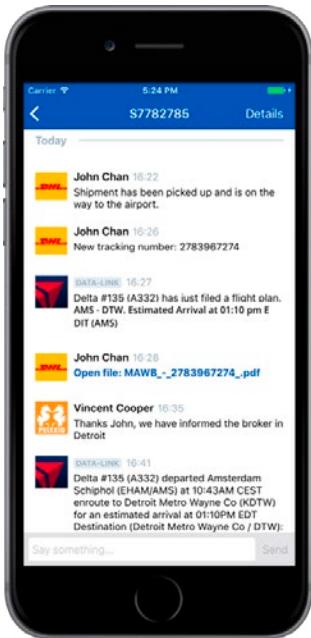
Cargobase, an online platform for spot-buy freight, launched a mobile application that allows users to book, approve, and track shipments, as well as interact with logistics service providers. If manager approval is required, the mobile app can be used to turn approvals around in minutes, avoiding delays and unauthorized movements.

Ocean transport provider **World Direct Shipping** extended its agreement with Port Manatee to maintain weekly service between the Florida Gulf Coast port from the Port of Coatzacoalcos in Veracruz, Mexico, for five more years. With a transit time of 2.5 days, the weekly World Direct Shipping service carries refrigerated produce from Mexico while returning from Port Manatee with paper, recycled materials, and oversized cargos.

//Technology //

CargoSmart Limited, a global shipment management software solutions provider, launched *Route Master*, a tool for shippers to view and optimize their ocean container shipping routes based on weighted parameters. The tool provides new routing options and vessel operator details so that shippers can improve supply chain velocity and mitigate risk as new ocean alliance networks went into effect in April 2017.

Logistics solutions providers Kewill and LeanLogistics rebranded as **BluJay Solutions** and unveiled the BluJay Global Trade Network, which provides a global supply chain ecosystem to give shippers end-to-end visibility. The BluJay Global Trade Network includes more than 40,000 shippers, carriers, forwarders, suppliers, and logistics service providers. Organizations can manage goods and services across an integrated Global Trade Network; rapidly onboard services, carriers, customers, and business units; and collaborate with business partners to expedite trade.

RightHand Robotics introduced *RightPick*, a combined hardware and software solution that can pick individual items to support e-commerce order fulfillment. Unlike traditional factory robots, *RightPick* handles thousands of different items using a machine learning backend coupled with a sensorized robot hand that works with all industry-leading robotic arms.

Autonomous warehouse robotics company **Locus Robotics** introduced *Locus Robotics Advanced Navigation*. The autonomous robotics navigation software enables multiple robots to work together in a coordinated way, as well as collaborate with workers in a warehouse. The system is designed to improve navigational accuracy and pick performance rates.

Logistics platform **Transporeon Group** launched its latest mobile order management solution, an app that links a driver's smartphone to the shipper for paperless dispatch and real-time visibility. Shippers receive immediate status messages, digital documentation, and ETAs no matter who is servicing the transport, even carriers outside the Transporeon network.

//Products//

Hyundai Forklift introduced BCS-9 stand-up counter-balanced battery lift trucks for narrow aisle operation. The three new models–15BCS-9, 18BCS-9, and 20BCS-9–are available in 3,000-, 3,500-, and 4,000- pound capacities. Equipped with on-demand steering, the forklifts' hydraulic motors activate while steering to reduce steering noise and energy consumption.

Cognex, a supplier of industrial barcode readers and machine vision, unveiled the DataMan 70 series of compact fixed-mount barcode readers. DataMan 70 reads 1-D and 2-D label-based barcodes and is small enough to fit in the palm of your hand. Its configuration options and small size make it suitable for mounting in tight spaces.

Fetch Robotics introduced two autonomous mobile robots to its fleet: Freight500 and Freight1500. Both new robots automate the delivery of bulky and heavy loads. Freight500 can move substantial loads, yet still fits through doorways and areas that people commonly traverse. For even bigger hauls, Freight1500 can support up to 3,300 pounds. Freight1500 can move standard-sized pallets as well as much bulkier cargo.

Intelligrated, an automated materials handling solutions provider, launched the IntelliSort HDS, a high-density parcel and e-commerce sortation system. Built on sliding shoe sorter technology, the IntelliSort HDS provides quiet, accurate, gentle sortation of a variety of product and packaging types.

Packaging company **Sealed Air** introduced a $475 inflatable packaging system for shippers with low-volume needs. The Fill-Air FLOW system provides an alternative to using polystyrene peanuts as void-fill and cushioning. The Fill-Air FLOW unit mounts to a wall or tabletop and produces 11 high-fill or 20 low-fill inflated plastic bags per minute.

A reusable alternative to tape, staples, and bands, **Box Latch Products** offers shippers a low-cost way to close cardboard boxes. The plastic products come in a medium size, to secure small to medium-sized boxes, and a large version, to close medium to large-sized boxes made from 1/16-inch to 5/16-inch-thick cardboard.

CALANDAR

SEPT 24

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cscmpconference.org | Atlanta, Ga.

AUDIENCE: Supply chain management professionals
FOCUS: End-to-end supply chain solutions; global supply chain best practices; increasing visibility; integrated business planning

CONFERENCES

JUN 20–21, 2017 La Jolla, Calif.
Worldwide Business Research
Retail Delivery
retaildelivery.wbresearch.com

AUDIENCE: Supply chain, logistics, and e-commerce executives
FOCUS: How retailers and e-tailers can bolster their fulfillment capabilities and inventory visibility; expanding fulfillment options and accurate forecasting

JUL 10–11, 2017 Lake Geneva, Wis.
Midwest Association of Rail Shippers
2017 Summer Meeting
mwrailshippers.com

AUDIENCE: Rail shipping executives
FOCUS: Resolving transportation and railcar supply problems; railroad operating practices; innovations in transportation and legislative matters; exploring the impact of regulatory, economic, and trade policy changes on rail shippers

SEPT 17–19, 2017 Long Beach, Calif.
Intermodal Association of North America
Intermodal Expo 2017
intermodalexpo.com

AUDIENCE: Intermodal freight stakeholders
FOCUS: Cloud-based solutions to intermodal challenges; the future of NAFTA and North America's trade lanes; the promise and perils of autonomous vehicles in intermodal; ocean alliances, consolidation, and marine terminal ownership; transloading trends

NOV 1–3, 2017 Miami, Fla.
World Trade Center Miami
Air & Sea Cargo Americas
seacargoamericas.com

AUDIENCE: Executives from the aviation, maritime, and logistics sectors
FOCUS: Enhancing the growth of the cargo industry; the latest safety regulations to secure cargo from biological, chemical, or explosive materials

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James M. Cox

"What's dangerous is not to evolve."
Jeff Bezos

"The amateurs discuss tactics; the professionals discuss logistics."
Napoleon Bonaparte

"My logisticians are a humorless lot; they know if my campaign fails, they are the first ones I will slay."
Alexander the Great

"Predicting rain doesn't count. Building arks does."
Warren Buffett

"What gets measured gets improved."
Peter Drucker

"Real artists ship."
Steve Jobs

"The line between disorder and order lies in logistics."
Sun Tzu

"There are no big problems; there are just a lot of little problems."
Henry Ford

"Nothing is too much trouble if it turns out the way it should."
Julia Child