

MAY 2020

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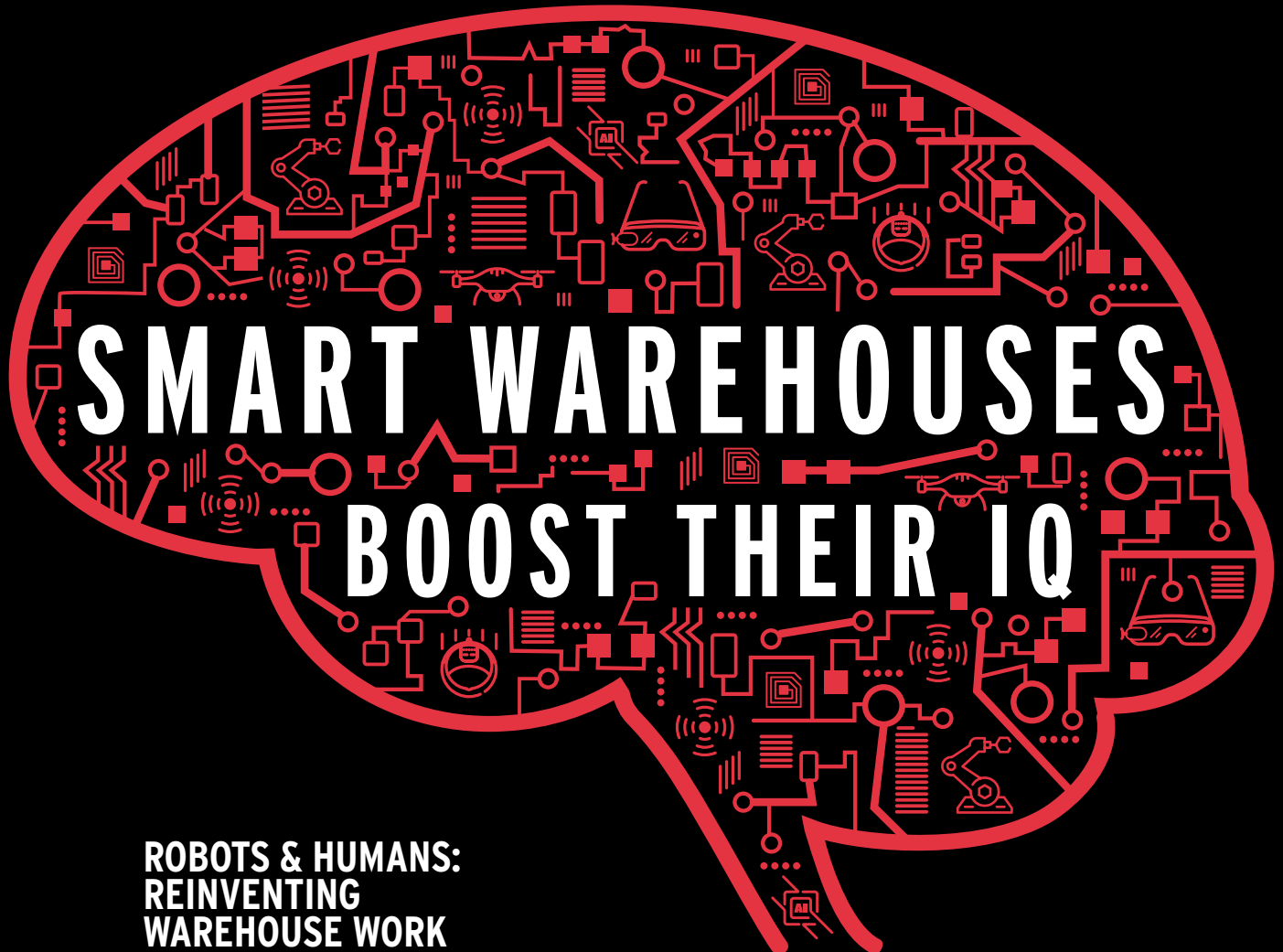
THE MAGAZINE FOR DEMAND-DRIVEN ENTERPRISES

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SPECIAL REPORTS

INTERMODAL
LEANS IN

PALLETS
TAKE THE SPOTLIGHT



ROBOTS & HUMANS:
REINVENTING
WAREHOUSE WORK

TMS GUIDE

POST-COVID PLANNING

30 years from now...

BEFORE & AFTER	ENGLISH LITERATURE	U.S. HISTORY	5-LETTER WORDS	-OLOGIES	POTENT POTABLES
\$200	\$200		\$200	\$200	\$200
\$400	\$400	THIS PANDEMIC CAUSED THE GREAT TOILET PAPER SHORTAGE OF 2020	\$400	\$400	\$400
\$600	\$600	\$600	\$600	\$600	\$600
\$800	\$800	\$800	\$800	\$800	\$800
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Info **SNACKS**

BITE SIZED SUPPLY CHAIN/LOGISTICS INFORMATION

CONSUMERS

ON THE

SHOPPING

BLOCK

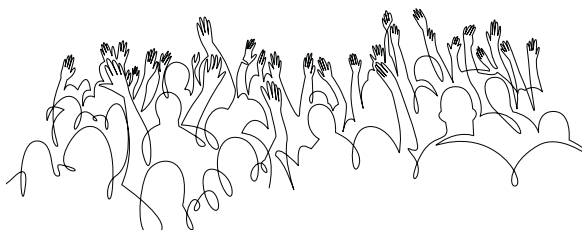


Younger people are more prone to stockpiling. More than 4 in 10 young shoppers admit to stockpiling items in preparation for the COVID-19 outbreak.



Consumers want to shop local, but Amazon still dominates. Nearly 9 in 10 shoppers say it's important to support local retailers, yet 4 in 5 shoppers say they are using Amazon during the COVID-19 outbreak.

—A Convey survey of more than 1,000 U.S. consumers revealed changing shopping behaviors and expectations in light of the COVID-19 pandemic.



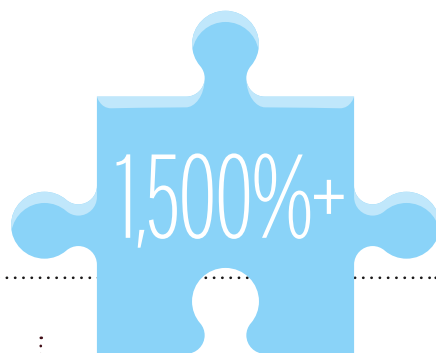
“What a feeling that was to have everybody clap. That must be what a celebrity goes through.”

—Truck driver Chuck Small, who rolled up to a New Jersey Costco where shoppers were lined up around the building. When he hopped out of his white Freightliner Cascadia and announced, “I’ve got your toilet paper!” the shoppers and employees all applauded.



“Within hours, we could turn locomotives back on and put them out to the fleet if we need to.”

—Jim Vena, COO, Union Pacific. An overhaul of operating strategies during the past few years positions rail contract operations for a quick rebound. Union Pacific and other railroads have focused on running fewer and longer trains that stick to tight schedules while cutting costs.



Weekly demand growth at Buffalo Games, North America’s largest jigsaw puzzle maker. The company has sold more than 1 million puzzles since mid-March 2020, as home-bound consumers desperately seek diversions.

FLYING COLORS

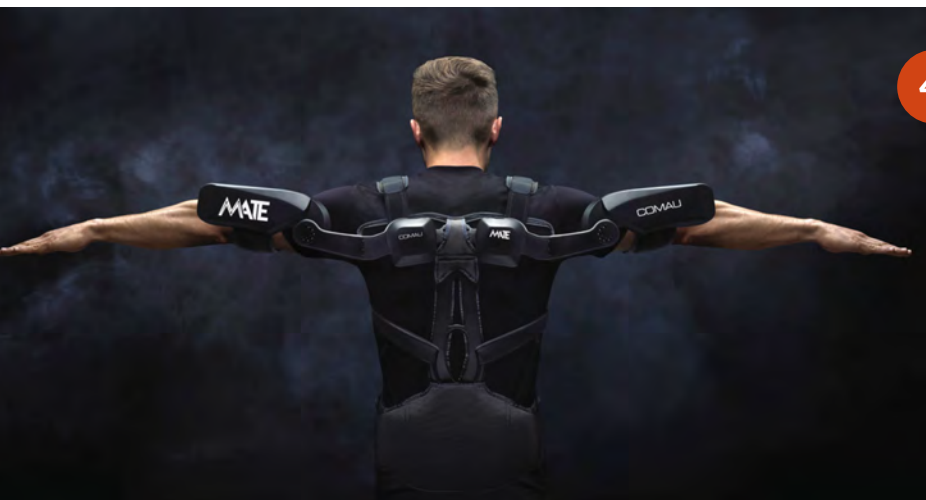


“Complexity is really a killer.”

—Roberto Isaias, EVP and chief supply chain officer for Mattel. The world’s largest toy manufacturer says it will reduce the number of shades of red—and other colors—available to its toy designers by more than one-third to support an ongoing mission to simplify its supply chain and cut expenses.

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warehouse labor
technologies*



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*Intermodal
moves shippers
forward*



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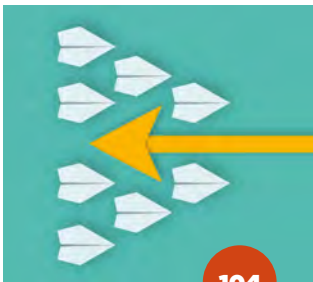
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The latest transportation and supply chain products and services

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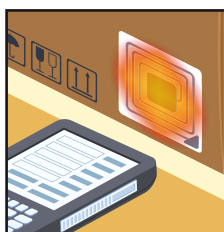
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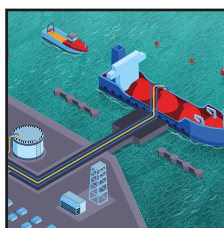
MORE NEWS ONLINE



SUPPLY CHAIN LABELING: HOW TO MANAGE CUSTOMER AND REGULATORY NEEDS

Customers want to see their e-commerce deliveries in near-real time, but meeting their expectations is not possible without using dynamic, data-driven label printing to help you make changes quickly and easily.

bit.ly/LabelingLogistics



REPLENISHING THE FUEL SUPPLY CHAIN

Fuel supply management is rarely a concern for consumers until a disruption occurs. But supply chain managers must closely monitor how they coordinate and replenish fuel, and stay ahead of the many external factors that can impact fuel delivery logistics.

bit.ly/FuelSupplyChain



5 OPERATIONAL ACTIONS THAT BUILD RESILIENCE

As shippers apply safety measures to protect employees from COVID-19, they also try to operate their supply chains under a new normal—shifting from survival to an “operate” phase. These five actions can help you build resilience and pave the way for success.

bit.ly/OperationalActions

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CHECKING IN

Staying Productive in Unproductive Times



Keith Biondo, Publisher

While driving around my neighborhood, I've noticed a lot more people putting items out to the curb. Have you noticed this? I wondered about that for a moment and then realized what was happening. People are using the virus downtime to organize, clean, and take up projects long postponed. The result is an uptick in curbside bounty.

The same is happening in business. No one could have anticipated what we are currently going through.

No panacea is providing the cure for what ails business operations no matter what "experts" say. There is no secret supply chain sauce or source of solutions. One-size answers will not fit all businesses. Who would have expected political leaders to kill a large chunk of the economy in an instant?

Basically, business-wise, you are on your own and will be in the future as the recovery kicks in. But like those garage-cleaning, motivated-to-organize-in-downtime homeowners, some business owners are doing the same.

A PAINFUL TEACHABLE MOMENT

Rather than wait for the next man-caused disruption or pandemic, smart business managers are extracting knowledge from a forensic investigation of their operations based on COVID-19 stress and kicking bad practices to the curb. Improving procurement practices? Yes. Upgrading technology? That too. Organizing warehouse operations? Finding new logistics partners? Revising and expanding business disruption planning? They are doing it all.

Fending off massive disruption by accelerating the shift to digital platforms is an answer for some. For many, customer buying habits have changed significantly, and the virus has increased Digital Darwinism for those who were late to the e-commerce party.

The number of unique digital shoppers rose 40% year over year in Q1 2020, according to Salesforce's Global Shopping Index. Digital shoppers drove 20% revenue growth compared to 12% in Q1 2019. Virus e-commerce buying outpaced the rate of pre-pandemic holiday shopping in 2019, which was seen as very strong.

What will business and consumer buying look like in a post-pandemic world? Will consumption habits snap back to the old normal? Not completely. A large lift in permanent work-from-home employees will change what people buy and when. More consumers have been acculturated to e-commerce and they won't go back.

A new Capgemini Research Institute report supports this dynamic, finding that consumers' online shopping patterns will continue to grow once lockdowns are over. Taking the time now to organize business practices that ensure success in that environment is the best way to be productive in an unproductive time. ■

Keith Biondo

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GOOD QUESTION

Readers Weigh In

What's the most unexpectedly good advice you've received about the supply chain?

Speed is not always the

solution. Breaking shipments into inventory replenishment and just-in-time SKUs allows price and transit time optimization. Asia-to-U.S.-East-Coast transit through the Panama Canal versus the Suez Canal differs by 7 to 13 days. Pushing inventory cargo to the slower/lower-cost options provides free warehousing on the water while reducing overall landed cost.

—Alan Baer
President, OL USA

Start small. Challenges like data quality and supply chain visibility require supply chain-wide cooperation that does not happen overnight. Quick wins through tests and pilots can give an organization confidence to expand innovation.

—Angela Fernandez
VP, Community Engagement
GS1 US

Don't try to be the smartest person in the room. And if you are the smartest person that isn't necessarily a good thing. It's about building teams with diverse viewpoints to help you learn and grow. Recruiting and developing people with different skill sets is essential.

—Darlene Wolf
SVP Strategic Partners
Arrive Logistics



Look beyond the numbers. Early in my career at a 3PL, I headed up a truckload bid for a large customer. The first round saved more than \$25 million. To my surprise, the client was disappointed. We revised our analysis and retained most of the client's incumbents, ultimately netting \$2.5-million savings.

The client's supply chain director pulled me aside and said, "There's a lot more to running a supply chain than just beating up carriers on price. Performance, keeping your word, and delivering on commitments have value. Our incumbents understand our service needs and provide a quality service at a fair price. It's a balance that saves in other areas of our supply chain and keeps customers happy." That's a lesson I still apply to this day.

—Greg Orr
President, CFI

Leverage a value calculator to select the right carrier because there's no such thing as "good and cheap" when it comes to moving your supply chain. When

you consider transit delays, claims, chargebacks, fines, and customer complaints, the service you need may require a bigger price tag up front, but will save your reputation and money in the long run.

—Marty Freeman
EVP and COO
Old Dominion Freight Line

Don't just show up to inspect and point out errors. Show up at the beginning. Meet the artisans and workers. If the craftspeople are able to look into your eyes and understand your larger mission, the product will reflect that care.

—Emily Soloby
Founder, Juno Jones Shoes

Have a great answer to a good question?

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

What COVID-19 supply chain pivot has impressed you the most? Why?

We'll publish some answers. Tell us at editorial@inboundlogistics.com or tweet us [@ILMagazine](https://twitter.com/ILMagazine) **#ILgoodquestion**

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DIALOG

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Quick TIP

Deploy systems in your facility that measure crucial data such as detention time to solve inefficiencies and improve operations. Facility operations have historically been a blind spot for shippers given their spread, complexity, and opacity.

—Sameer Dohadwala

Head of Central Operations, Uber Freight



Re. April 2020 Checking In By IL Publisher Keith Biondo

bit.ly/NowTheyKnow

Your *Checking In* is a great read. Supply chain workers really are some of the new heroes in the COVID-19 crisis.

For example, the Key Food supermarket across the street has been so well stocked (great management that cares about the community). Every morning I see them offloading J.B. Hunt trucks and various others. I never fully understood how essential supply chain is to all of our livelihoods until I started stalking truck deliveries from my bedroom window at 6 a.m. every day to make sure we have enough milk in the fridge.

So if you know anyone at J.B. Hunt, thank them for me and for their employees that they take care of, who take care of all of us.

—A subscriber, via email

Re. COVID-19 Supply Chain Resources & Strategies

bit.ly/COVID_SC_strategies

To cope with COVID-19 disruption, we've gone on the offense. I have prospected to shippers and companies in industries that are now rethinking how they reach their customers.

For example, we're talking to seafood and meat distributors that are pivoting to a B2C business model and require home delivery. We're using our cold chain experience to go after them, as well as specialty pet food suppliers and small grocery stores.

Another warm market we are penetrating is local distilleries and furniture manufacturers that are creating critical supplies and need to get them to hospitals and other essential service providers.

My advice: Change your mindset to how it was when you first started your business. Throw every idea against the wall until you find one that fits and repeat as fast as possible. It's a great time for people who think creatively. There are no barriers to entry. Right now, there is nothing but opportunity out there. The great ones will seize it.

I'll admit it—I had my moment of

"woe is me" but then I decided it's time to compete; to find new industries and new customers.

The world will never operate the same way again so I would not just "wait it out."

Growing up, my dad used to always tell me there are three kinds of people in this world: people who watch things happen, people who wonder what's happening, and people who make things happen. The best way to predict the future is to make it.

—Jason Burns

President, QCS Logistics

Board Member, Customized Logistics and
Delivery Association

Re. Good Question: What supply chain terms do people sometimes confuse?

bit.ly/GQ_supplychainterms

Procurement vs. purchasing. Because of the potential for significant cost savings, we need to understand what these two terms mean.

What is probably the key difference is that purchasing is something we do quickly when we need a product or service. Procurement, on the other hand, involves building relationships and selecting goods and services based on the value they bring to the table.

—Michael Wilson

Vice President, Marketing and Packaging
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10 TIPS

Leading Your Team

Clear and effective leadership helps set a company's culture and motivates employees to work together toward a common goal.

1 HAVE A VISION AND DREAM BIG.

Put in the work with your team to find a niche that allows you to revolutionize logistics. Be creative and set your sights on something far-fetched. A great vision should feel beyond your reach. If you could do X in 15 or 20 years, what would it be?

2 CALIBRATE YOUR CULTURE.

Core values are the compass that guides your team's behaviors. I'm not talking about the things everyone should embrace, such as safety, integrity, and success. These values need to represent something deeper and should be easily recognizable in the best of the best employees. Make them your own, and use them to calibrate everything you do, aligning everyone on your team to a common heading.

3 BRAND A CLEAR MISSION.

Who, what, and why are you delivering today? Make the mission as concise and clear as possible. A mission statement ensures you stay grounded in what brings profit and success today, so you can think about tomorrow. Make it visible. Everyone on your team has a purpose tied to this brand; make sure they feel it.

4 KNOW YOUR ROLE.

Every link in the chain—every person, every function—is critical. Make sure your team understands the communication and products they own, so every link in the chain is just as strong as the previous and next. Document the playbook for the positions on your team, and make sure people work together and understand each other's distinct purpose to avoid turf battles and power struggles.

5 ASSESS YOUR ANCHOR POINTS.

Each operation has critical anchor points that hold your chain in place. Don't take these strong backs for granted. Identify and invest in your anchor points, maintain them, and constantly evaluate how they are doing. Reward the success they enable and create more anchors along the value stream.

6 ENGINEER FLEXIBILITY.

Prepare for change; it is constant. Engineer and design pivot points along your value stream. Forecast mitigation actions and prepare succession strategies. Built-in flexibility will allow you to weather the storm when the environment suddenly changes, and it will.

7 DELEGATE AND EMPOWER.

Know how to manage risk, at all levels. Predefine levels of authority for cost, schedule, and technical levers, then push that control to the lowest level by empowering those closest to the work. Collect and track data to assess the health of your teams' decisions and adjust based on risk tolerance. Data should drive decisions at every level, and everyone needs to be empowered to make decisions with good data.

8 OVER COMMUNICATE; CONTROL THE MESSAGE.

We live in a world overflowing with information, and it is your job to calm the noise. Your communication must reverberate across 360 degrees—forward visioning, backward reflecting, and sideways sharing. Know your customers, stakeholders, suppliers, and team members. Constantly drive transparency of your messaging.

9 BE VULNERABLE AS A PERSON.

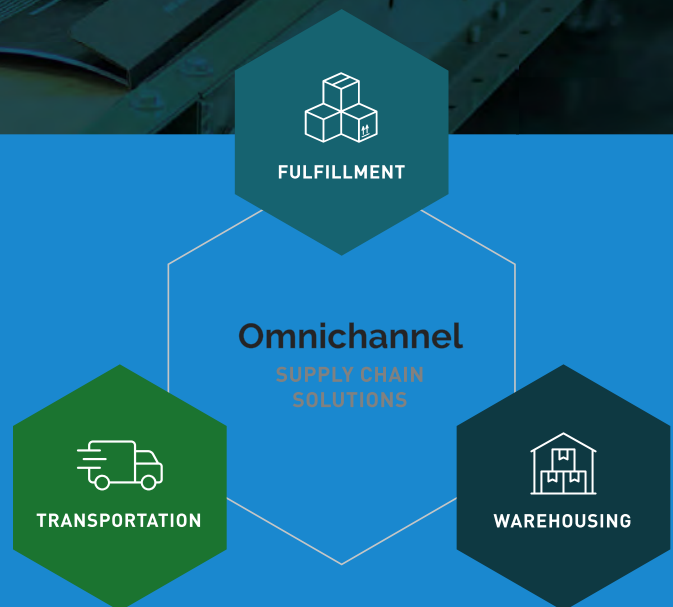
Bosses are not superheroes, nor are they mythical creatures. Be great by staying humble and approachable. Be thoughtful and thankful, and show appreciation to everyone who enables your team's successes. Make sure everyone sees the person you are—share your story and inspire theirs.

10 PLOT OUT YOUR SEASONS AND CELEBRATE THE WINS ALONG THE WAY.

Track progress toward your vision, honor the milestones along the journey, and build in time to relax and reflect. Find your battle rhythm, and make sure the milestones consider the need for people to recharge. Allow the team to celebrate both at work together and away as individuals. Cultivate this healthy balance and have fun.

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Animal shelters across the United States are seeing a significant surge of applications for fostering and adopting animals during COVID-19,

resulting in high demand for supplies at pet retailers.

Local shelters in Chicago, Dallas, New York City, Los Angeles, Kansas City, and many other cities report fostering applications are up as much as 10 times what they were on a typical day before the pandemic.

Pet retailers are responding to meet this new demand. For example, more than 490 Pet Supplies Plus stores in 34 states nationwide now offer free two-hour curbside pickup. Pet owners can order online, drive to their nearest location, and a team member brings the items to their vehicle.

In addition, more than 200 Pet Supplies Plus stores are delivering pet food and supplies directly to homes.

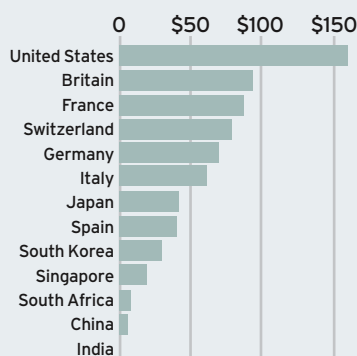
—PetfoodIndustry.com

“Nearly 85 million U.S. households today have at least one pet, up from 73 million in 2010.”

— AMERICAN PET PRODUCTS ASSOCIATION

WHICH COUNTRY SPENDS THE MOST ON PETS?

2019 MONTHLY SPENDING PER PERSON



SOURCE: THE ECONOMIST



FEEDING FIDO

Along with toilet paper and hand sanitizer, shoppers are stockpiling food and toys for their pets during the COVID-19 crisis, according to CNN Business.

Pets are not eating more than they used to, analysts say. But their owners are panic-buying for the long haul at big retailers that remain open, such as Walmart and Costco, as well as pet stores such as Petco.

Specialty retailers like Petco account for nearly one-third of all dog and cat food sales in the United States and roughly half of fish and companion animal foods. “Mass retailers and grocery stores simply can’t feed all our pets,” a Petco spokesperson told CNN.

Shoppers are also going online to buy in bulk for their pets as they hunker down at home. Online pet supply retailer Chewy is hiring 6,000 to 10,000 employees at its fulfillment centers to keep up with demand.

“Dogs are most loved among all pets; they outrank cats in popularity by about five to four.”

—GFK, A MARKET RESEARCH FIRM



THAT'S A GOOD BOY

Through financial contributions and food donations, many pet food companies are helping out animal rescue organizations, homeless shelters, food pantries, and struggling communities during the COVID-19 crisis.

- Nestlé Purina primarily supports three charities: the Petfinder Foundation, which has a COVID-19 fund for animal rescues and shelters; GreaterGood.org's Rescue Bank, which supplies animal rescue organizations with pet food and supplies; and RedRover, which offers emergency grants to pet owners who are survivors of domestic violence and those who contract COVID-19.

- Vital Essentials kicked off its “Vital Relief Challenge” with a \$100,000 donation to food pantries, shelters, and nonprofits in the Green Bay, Wisconsin, area. Through the challenge, the company encourages other pet food brands to give as much as they can.



92%

The increase in overall sales for pet stores on March 20, 2020, compared to the same date in 2019 after pet owners stocked up on food, toys, and supplies.

260%

The increase in sales reported by New York City pet stores on March 20, 2020. Sales were significantly higher in several regions hit hard by COVID-19.

— FOOD INDUSTRY EXECUTIVE



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READERPROFILE *as told to Karen Kroll*

The True Value of Supply Chain Transformation



LYNDSI LEE is senior vice president of supply chain with True Value Company, a leading hardware and home improvement wholesaler.

RESPONSIBILITIES: Drive end-to-end supply chain optimization, develop integrated planning and logistics strategies, and build best-in-class sourcing programs.

EXPERIENCE: Division vice president, inventory management and global sourcing, also with True Value; principal, project leader, Boston Consulting Group; manager, merchandising operations, chosen for business leadership program, Home Depot.

EDUCATION: University of Florida, BS and MS, decision and information sciences, 2000; Northwestern University, MBA, 2008.

In April 2018, True Value Company transitioned from a co-op model to a pure-play wholesaler. As a distributor of hardlines (products that are literally hard, like electronics, appliances, and tools), we provide about 90,000 product SKUs to 4,500 True Value stores around the world.

Each store is independently owned and operated and carries its own mix of product SKUs. We're investing \$150 million to transform our supply chain into one that is flexible and adaptable, and will take us into the future. We're about three years into the five-year program.

FROM POINT TO POINT TO HUB AND SPOKE

As part of our transformation, we're moving from a point-to-point to a hub-and-spoke system that gives us the ability

to grow. The spokes will stock the fastest-moving items, while the hubs will carry almost all SKUs. Our goal is to optimize our network and efficiently deliver the best service possible to our stores.

INVESTING IN TECHNOLOGY

In 2019, it took us just eight months to build a 1.4 million-square-foot facility in Wilkes-Barre, Pennsylvania, from the ground up. The new distribution center supports the entire northeast region of more than 1,000 retail locations. We're also investing in a demand and fulfillment solution that uses advanced algorithms to better anticipate changes in demand.

In 2018, we went live with our new model in the Midwest; one year later, we went live in the Northeast. It's going incredibly well. With the hub-and-spoke model, our fill rates in the

Lyndsi Lee Answers the Big Questions

1 How would you describe your job to a five-year-old?

I make sure what you want is on the shelf when you walk into the store.

2 If you could speed the development of a supply chain-disrupting technology, which would it be and why?

We talk a lot about digitization. It's still a bit of a buzzword, but I see incredible value in end-to-end, instantaneous transparency, and using analytics to deploy inventory where and when we need it.

3 How has the disruption caused by COVID-19 impacted True Value's supply chain?

True Value remains focused on keeping our supply chain strong and reliable. Our distribution centers remain open and operating at full capacity at this time. We have implemented a number of virus protection and prevention steps to ensure the health and safety of our associates across our 13 distribution centers.

Midwest, measured as first-time fill rate based on lines ordered, are topping 99%. Competitors tend to be in the mid-90s, giving us an advantage.

In fact, more than 600 retailers joined the True Value family during the past few years. They're attracted by our global brand and lack of stock requirement.

A couple of factors have been key to our success in making these changes. One is a focus on our customers. We're building a supply chain that can meet our customers' needs today and is dynamic enough to handle changes, like those created by e-commerce, into the future.

And, in the end, the business case has to come together. Customers come

first, and we also have to make sure we're delivering a return.

I grew up in a family of entrepreneurs; my dad started and sold a sterling silver and china business three times. He also dabbled in antiques and commercial and residential real estate. That background sparked my passion for business.

ON THE FAST TRACK

At the University of Florida, I was able to earn a master's and bachelor's degrees in 4.5 years. That meant an extra season of football, and more exposure to supply chain education.

I started my career in IT, and then transitioned to a management rotation

program, where I concentrated in supply chain. I love working in supply chain. It touches every aspect of the customer experience and always presents new problems to solve.

I also take a lot of pride in mentoring and developing my team. When I joined True Value, I focused on building a culture where people are proud and excited to come to work.

In my career, I have been positioning myself to pivot as needed and take risks. I haven't had a linear path to success and I believe there's no linear progression in a career. You create opportunities for yourself, whether lateral or otherwise. ■

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[IN FOCUS]

NOTED

The Supply Chain in Brief

> GOOD WORKS

Fresh Del Monte Produce donated 919,000 pounds of fresh fruit to the Houston Food Bank to help those affected by COVID-19. The company has donated more than 1.1 million pounds to the food bank in 2020.



Agriculture equipment maker **Deere & Company** is producing protective face shields for healthcare workers in Moline, Illinois, in collaboration with the United Auto Workers, Iowa Department of Homeland Security, and the Illinois Manufacturers' Association. Deere expects to produce 25,000 face shields initially, and ordered supplies to provide an additional 200,000.

Food distribution center **McFoods** partnered with **LogistiCare**, a nonemergency medical transportation company and transportation vendor for New Jersey Medicaid participants, to create a home delivery program that serves local food pantries, community members, and those who previously relied on public transportation to buy food.



Nestlé mobilized its supply chain, distribution, and retail partners to launch a global COVID-19 response, which includes partnering with Freshly and Meals on Wheels to provide 40,000 meals to at-risk, homebound senior citizens. The company will also deliver 52,000 bottles of water to residents in Flint, Michigan.

m&a

- Global integrated container logistics company **Maersk** acquired **Performance Team**, a U.S.-based warehousing and distribution company.
- Less-than-truckload transportation company **Polaris Transportation** acquired **PRI Logistics**, a third-party logistics provider.
- Third-party logistics provider **BlueGrace Logistics** acquired **Anthym Logistics**, a freight broker with primary offices in Tampa, Florida, and Chicago, Illinois.
- Transportation provider **Atlas World Group** announced that its subsidiary, **Atlas Logistics**, has acquired retail home delivery company TopHAT Logistical Solutions.
- **Bulkmatic**, a North American bulk transporter, acquired Illinois-based **Paris Transport**.
- **FOG Software Group**, a division of Vela Software and Constellation Software, acquired enterprise parcel shipping solutions provider **ProShip**.
- Materials handling solutions provider **Hy-Tek Material Handling** acquired Atlanta-based **Johnson Stephens Consulting**, a supply chain operations consultancy serving retailers, wholesalers, and distributors.
- **Allen Lund Company**, a transportation and logistics provider, acquired Des Moines Truck Brokers.

> UP THE CHAIN

Athersys appointed **Maia Hansen** as its senior vice president of operations and supply chain to establish sustainable operations that enable large-scale commercial manufacturing and distribution capabilities. Prior to joining Athersys, Hansen was a senior partner at management consulting firm McKinsey & Company.

> GREEN SEEDS



The **Port of Seattle** plans to reduce its carbon emissions by 50% by 2030 per a contract with U.S. Gain for Renewable Natural Gas, a natural gas alternative that recycles existing carbon. The port can purchase enough fuel to heat 55% of the Seattle-Tacoma International Airport terminal and power its entire bus fleet.

Toshiba America Business Solutions recycled nearly 187 tons of e-waste from spent toner consumables with its EcoSmart Toner Recycling Program. The program allows customers to recycle spent Toshiba imaging supplies so they can be turned into new useful materials.

FourKites launched new sustainability dashboards to provide customers with visibility into the environmental impact of their supply chain operations. The dashboard identifies specific areas contributing high levels of greenhouse gas emissions so companies can develop effective sustainability strategies.

> SEALED DEALS

• **Frayt**, a technology company that provides an app for on-demand shipping, partnered with 21 **Kroger Marketplace** stores in Ohio and Kentucky to provide same-day delivery of large outdoor items, including patio sets, grills, and mulch.



• **General Motors** appointed **CEVA Logistics** to manage its ventilator production supply chain. Under GM's contract with the U.S. Department of Health and Human Services, CEVA will deliver hundreds of parts used to make the Ventec Life Systems V+Pro critical care ventilator at General Motors' Kokomo, Indiana, factory.

> RECOGNITION

• **Shape Technologies Group** received the **2019 Overall Landstar MUST Customer of the Year Award** from Landstar Transportation Logistics. The Mutual Understanding of Safety Together (MUST) program involves an on-site review of a customer's facility, followed by an analysis of its safety and security practices.

• **Command Alkon** was named one of the **World's Most Innovative Companies** in the logistics category by Fast Company, earning a top 10 finish for its CONNEX Platform. The logistics company was also presented with a Bronze Stevie Award in the Best Customer Engagement category.

• Toronto-based logistics solutions provider **Rodair** received Canada's **Best-Managed Companies** award for overall business performance and sustained growth.

> SHOVEL READY

Domino's is constructing a 59,000-square-foot supply chain center in Katy, Texas. The building will produce fresh pizza dough for more than 300 Domino's stores in the region. The space incorporates automated technology, including ingredient batching, mixing and portioning, weight adjustment, and tray stacking.



Transwestern Development broke ground on a 225,185-square-foot warehouse in Colton, California. Near the junction of Interstates 215 and 10, the facility provides access to both thoroughfares and the greater Southern California region.

Amazon is opening a 250,000-square-foot warehouse in Sonoma Valley, California, in fall 2020 before the holiday season. The facility will serve as the last stop for e-commerce packages before they are delivered to customers.

[IN FOCUS]

TAKEAWAYS

Shaping the Future of the Global Supply Chain

Retailers: It's Time to Act

While 43% of retailers say they're taking aggressive action to mitigate the effects of COVID-19, 38% are taking only some action, and 19% are taking a wait-and-see approach, according to Digital Commerce 360. Retailers need to take significant action, however, to address the following five issues, says the research company:

1. Consumer confidence: 97% of retailers report declining consumer confidence as many buyers find themselves in a waiting game to make purchases, and 54% see COVID-19 causing a significant decline in consumer confidence.

2. Sinking revenues: Demand and declining revenues have the most impact, says Digital Commerce 360, due to store and production closures or reduced traffic. Half of retailers expect revenue to decline significantly, and 27% predict some decline.

3. Survival: Retailers worry about the future of their business where liquidity and cash flow were challenged, and the reality that outside investment had ground to a halt, says Digital Commerce 360. That reality already includes:

- Declining consumer confidence impacting business: 48%
- Updated sales outlook: 44%
- Re-forecast revenues: 40%
- Reduced store traffic: 27%
- Adjusted financial guidance: 25%

4. Mixed e-commerce results:

Traffic, conversion, and average order value are down for almost half of retailers, and 55% report e-commerce declines. About 34% report positive results, and 11% find e-commerce as initially projected. While furloughs and work-from-home models were inevitable, some retailers successfully moved more shoppers online by:

- Encouraging shoppers to buy online (44%)
- Announcing their COVID-19 plans (38%)
- Sending COVID-19 email promotions (21%)

5. Compromised supply chains:

Current supply chain challenges include delivery delays (22%), cancellations due to inventory shortages (15%), and back-ordered products (14%), according to Digital Commerce 360. These are the top actions retailers take to manage their supply chains:

- Communication: 53%
- Coordination for risk mitigation: 51%
- Contingency planning: 25%
- Revisiting the supply chain: 21%



Global Trade Goes Digital

Freight forwarders and shippers can book sea, land, and air cargo shipments to and from anywhere in the world with the rollout of DP World's online logistics tools and services. The company accelerated the launch to help shippers navigate the COVID-19 crisis and keep trade—particularly essential food and medical supplies—flowing.

The new digital trade and logistics platforms use DP World's global network of ports, terminals, and economic zones to offer end-to-end supply chain services. The initiative follows DP World's acquisition of SeaRates.com, LandRates.com, and AirRates.com, platforms that enable shippers to transport cargo worldwide.

DP World also created the Digital Freight Alliance, an online association that brings freight forwarders onto one platform, giving them access to new tools, routes, and services.

HOW COVID-19 IMPACTS E-COMMERCE RESULTS

	UP	ABOUT THE SAME	DOWN
Traffic	27%	28%	45%
Conversions	33%	16%	51%
Average Order Value	20%	29%	51%

SOURCE: DIGITAL COMMERCE 360



TAKEAWAYS

Tailoring Apparel Supply Chains for the Future

PLAYING IT SAFE

Digital tools that confirm a person's health status can create safe work environments while also protecting personal privacy as businesses and supply chains recover from the COVID-19 disruption, according to MIT professor Alex "Sandy" Pentland, who is working on this issue with the United Nations and Club de Madrid, a consortium of former democratic presidents and prime ministers.

Creating a safe workforce is behind some of the most successful efforts at suppressing the disease. Countries such as Taiwan, Korea, and Singapore now have a certified group of workers that can help restart the economy—but democratic countries see that

approach as a threat to civil liberties, he says.

“RESTARTING THE ECONOMY REQUIRES USING BLOOD TESTS TO IDENTIFY PEOPLE WHO ARE IMMUNE, SIMILAR TO HOW PROOF OF VACCINATION IS REQUIRED FOR CHILDCARE WORKERS.”

To protect personal privacy, Pentland proposes that hospitals, banks, and other civic institutions serve as repositories for

health data, as they already do for financial and personal information. This would determine individuals' ability to work while avoiding national or state registries, which are tempting targets for misuse.

This health certification may help decide which businesses are safe to reopen, and make contact-tracing more efficient. Certifying workers could be accomplished with high-tech methods such as secure multiparty computation or “risk maps” aggregated from anonymized data, he says.

Financial incentives could help kickstart the process. The government, for example, could offer tax breaks to companies that employ safe employees, and businesses could offer increased pay to motivate workers to take public-facing jobs, Pentland suggests.

Apparel brands and retailers can use the COVID-19 crisis to take stock of existing business models and create more stable and sustainable supply chains for the future, finds GlobalData.

Fashion retailers in key consumer markets across Europe and North America fight for survival as stores close, sales slump, and inventories mount. For many, the response has also been to abandon or scale back orders, and delay—or even cancel—payments to vendors.

“Global clothing supply chains have unraveled in just a few short weeks, as has the trust and goodwill between many buyers and manufacturers,” says Leonie Barrie, apparel analyst at GlobalData. “Rebuilding these relationships is key if

the sector is to recover, and now is the time to start thinking about how the apparel industry can reset for the future.

“When the dust eventually settles, brands and retailers will depend on their suppliers to ramp up production,” she adds. “But if large numbers of factories have gone bankrupt, where will they source their goods? Onboarding new factories is a long and complicated process.

“Retailers that have treated suppliers badly may also find their support lacking when they eventually come to restock,” Barrie notes. “Consumers, too, may shun brands whose focus on self-preservation is at odds with their promises of social responsibility.”

Investors are also pressuring companies to maintain payments

to suppliers, and legislation that compels firms to consider the welfare of supply chain workers could be used to sue those that have not behaved responsibly.

“Actions speak louder than words and while collaboration, cooperation and strategic partnerships have been rallying calls in recent years, they’re needed now more than ever before,” she says.

“The apparel industry must start planning a way out of this crisis that can bring about positive and lasting change,” Barrie says. “Stronger and more stable relationships with supplier companies and countries, as well as cross-industry initiatives to fix flaws in the system, are urgently needed now if we’re going to weather storms in the future.”



TAKEAWAYS

THE IMPORTANCE OF INVENTORY

Once the COVID-19 pandemic subsides and doors reopen, apparel and footwear retailers say their main concern is inventory accuracy—even over improving online order fulfillment and managing returns, according to a survey by SML RFID, an enterprise software solutions provider.

Retailers have more inventory than ever throughout their supply chains, and with staff being furloughed and stores shut down, they have little confidence in their inventory levels for each SKU, says SML RFID. On top of that, consumers have put off buying apparel and footwear amid this cloud of uncertainty. As a result, retailers may have an additional 1 billion items of excess inventory until consumer spending stabilizes.

When stores, warehouses, and distribution centers reopen, retailers will need to mark down millions of items and move entire missed seasons of units into storage to make way for new products within their stores, and then push them to their e-commerce channels, says SML RFID. To do so requires a baseline inventory position.



Big Wheels Keep on Turnin'

Trucks continue to move—in many cases faster than usual—to respond to the demands placed on the industry by the COVID-19 pandemic, according to new data from the American Transportation Research Institute (ATRI).

For example, at the intersection of I-85 and I-285 in Atlanta, known locally as Spaghetti Junction, afternoon rush-hour truck speeds are typically slower than 15 mph due to congestion. Currently, truck speeds average 53 mph, finds ATRI's data.

Among the hardest hit states, New York, California, and Illinois, the data shows similar changes:

■ In New York, along I-495 in Queens, the afternoon rush typically sees average truck speeds of 16 mph. Speeds have now more than doubled, averaging 38 mph—still below the posted speed limit, but certainly an improvement.

■ In Los Angeles, at the intersection of I-710 and I-105, truck speeds during highly congested morning rush hours are normally less than 25 mph between the hours of 6 a.m. and 8 a.m. Truck speeds now average 53 mph in the morning as Californians stay home, and truck deliveries have increased.

■ At the Byrne Interchange in Chicago, where I-290 intersects with I-90 and I-94, morning truck speeds now average 43 mph, more than twice the typical morning rush-hour speed of 20 mph.

Several factors related to COVID-19 account for these results. One is the dramatic reduction in commuter traffic, allowing trucks to operate at higher speeds, particularly during traditional rush hours. Another is the 24/7 truck operations that generate higher average truck speeds during nearly all hours of the day.

Goodbye NAFTA, Hello USMCA

It's all systems go for the United States-Mexico-Canada Agreement (USMCA) to take effect now that all three participating countries have taken the final steps necessary to comply with the commitments.

According to the agreement, the USMCA is

to enter into force on the first day of the third month subsequent to completion of these final steps.

The USMCA replaces the North American Free Trade Agreement (NAFTA).

Businesses engaged in North American trade should review the USMCA requirements, including

the rules of origin, to determine which of their goods qualify.

Businesses not yet engaged in North American trade should review the agreement and look for opportunities that trade between the United States, Canada, and Mexico can offer.



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Creating Differentiation Through Innovative E-Commerce Fulfillment



Kraig Foreman
Vice President, Operations
DHL Supply Chain
Logistics.dhl.com

For many consumer brands and retailers, simply meeting baseline expectations can represent a missed opportunity. By surprising and delighting customers through an exceptional delivery experience, they can differentiate themselves and build loyalty.

Accomplishing this experience requires a fulfillment operation capable of exceptional speed and agility while tailoring packaging to the brand image.

Exceptional Speed

Retailers and consumer brands have been playing a game of catch-up when it comes to fulfillment speed, continually chasing customer expectations.

Compressing delivery times stresses warehouse processes and increases transportation costs and complexity. This is particularly true for midsize retailers and consumer brands who are serving B2B, retail, and D2C channels from the same centralized distribution center.

They don't have the luxury of dedicated e-commerce systems and processes that enable them to consistently meet the delivery times customers now expect.

Fortunately, there's a way off this treadmill. The "secret sauce" for achieving next-day or same-day delivery is ensuring products are positioned close to the customer at the time the order is placed through a distribution network with nodes in major metropolitan areas.

This may seem cost-prohibitive for all but the largest players, and it is if retailers go at it alone. But when they work with a 3PL that is consistently investing in technology and new distribution centers, they can increase service consistency and offer their customers unexpectedly fast fulfillment.

When shippers work with a 3PL that is consistently investing in technology and new distribution centers, they can increase service consistency and offer customers unexpectedly fast fulfillment.

Unusual Agility

Few organizations have the in-house expertise and resources to support customer-centric events and launches. That puts unnecessary limitations on retail and brand creativity. Working with a 3PL ensures retailers and consumer brands have the flexible infrastructure, project management expertise, and scalable resources to support the launches and events at the heart of many loyalty programs.

That agility should also extend to returns handling.

Ensuring returns are hassle-free can increase sales while efficient returns processing reduces e-commerce costs.

Brand-Building Packaging

And whether your brand is based on luxury, sustainability, or economy, your packaging is either working to support your brand image or working against it.

Customers of premium and luxury brands should "feel" the brand in the unboxing experience while brands that emphasize

sustainability can erode their credibility with packaging that appears wasteful or is not recyclable.

A 3PL can help you design a packaging solution that ensures your customers experience your brand in the desired way, and they can create that experience without inhibiting the efficiency of the fulfillment process.

Brands that have been most successful at supporting new e-commerce and omnichannel services have been those that recognize the limitations of their in-house supply chain expertise, and partner with a 3PL that can deliver the scale, flexibility, and operational excellence required to support continuous innovation.

For more information on DHL e-commerce fulfillment services, visit bit.ly/DHL_supplychain

We Must Learn to Mitigate Supply Chain Disruption from Disasters



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While the coronavirus pandemic put supply chain weaknesses on display, it has also shined a light on where we need to strengthen our capabilities to mitigate future disruptions.

The onset of COVID-19 had a negative impact on various supply chains. Inventory stopped flowing from overseas suppliers to U.S. retailers and manufacturers just as consumer demand for essential goods spiked.

The trucking shortage we've all been trying to ignore asserted itself in the form of transportation bottlenecks and capacity shortages. Importers found themselves with empty warehouses as incoming shipments dried up, while exporters were stuck holding inventory and in desperate need of overflow space.

While the speed with which the supply chain was disrupted by the coronavirus pandemic put supply chain weaknesses on display, it has also shined a light on where we need to strengthen our capabilities to mitigate future disruptions.

Here are some areas the supply chain must address moving forward:

Workforce health and safety. Coronavirus showed us the supply chain needs to put more focus on the health of our workforce. Worker-related disruption can be mitigated in the future by implementing effective health and wellness benefits to support the ground-level essential workers that the supply chain depends upon.

Inventory management practices. The last decade has seen a dramatic shift toward Just-in-Time inventory practices and other methods to reduce storage costs. Moving forward, retailers, distributors, and manufacturers need to reevaluate their inventory practices and how they influence their ability to tolerate disaster-related disruptions.

E-commerce viability. E-commerce grabbed an increased share of the retail market and will likely hold on to it post-pandemic. However, it's worth noting even the big retail and e-commerce giants ran out of essential items relatively quickly. And when consumers turned to online grocery delivery while under shelter-in-place orders, they couldn't find delivery windows for days, weeks, or at all.

Moving forward, it's essential that e-commerce players shore up their capabilities from distribution through the last mile.

Rapid response capabilities. Shippers and their logistics providers must develop the ability to respond to threats and disruptions by scaling storage or distribution space, implementing technology, optimizing vendor and carrier management, and more.

Optimization. When the supply chain is under consistent strain, it offers a prime opportunity to identify out-of-date processes, practices, technology, and equipment. Shippers and logistics stakeholders should already be analyzing data to find out what failed and what could have been done differently.

Technology. The supply chain sector has relied on technology to meet challenges for decades. We optimized routes and shipments with TMS solutions. We enhanced movement and picking in the warehouse with WMS solutions. We addressed labor shortages by supplementing existing workers with wearables and robotics. We will need to improve these technologies and create others to address the problems laid bare by this pandemic.

It's Up to Us

The health and safety of people everywhere depend on the ability of the supply chain to keep goods and emergency supplies moving in a crisis. The impact on the national and global economy has been catastrophic. As supply chain professionals, it's up to us to develop new best practices, processes, and technologies that enable us to bend under extreme stress without breaking. Supply chain volatility has been our new normal for awhile now—this is what we do.

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President

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*More than
ever before,
maintaining
flexibility in
logistics is
essential.*

Your business is likely facing a rapidly escalating number of issues. You can no longer delay; now is the time to take action to get ahead of what may be forthcoming. You need to start establishing multiple contingencies as, more than ever before, maintaining flexibility in logistics is essential.

You are now faced with a series of choices: Do you adapt your existing processes to current realities and those that can be anticipated? Do you maintain the status quo; can you? Do you implement a technology solution to augment your contingencies?

These are critical questions—the answer should be dependent upon whichever affords you the greatest ability to improve efficiency, maintain flexibility, and drive down costs.

In order to maximize your decision, a solution must be adapted to the company's processes, or the company's processes must be adapted to the solution. As a result of this adaptive period, promised advantages are delayed while expenses are accelerated. The larger the solution, the longer the implementation, the higher the risk, the higher the costs, the longer the return.

Taking an Incremental Approach

With an incremental solution acquisition model, companies can achieve the advantages and mitigate risk by deploying a series of solutions in consecutive fashion while propelling a shorter run-up to a return on investment.

This serves to accelerate savings, decelerate expenditures, reduce the impact on existing macro-operations, and provides a greater degree of flexibility; *changing a plan is much easier and less expensive than changing installed systems and processes.*

This incremental approach focuses attention on solving experiential issues, whereas deploying all-at-once solutions requires a longer outlook relying upon forecasts and predictions—all while running the risk of magnifying legacy inefficiencies.

Do the Simplest or Easiest Work First

Focus on the low-hanging fruit and address inefficiencies, reduce freight expense, simplify execution, make transportation information immediately visible to all parties involved in the transaction process, improve communications, and increase productivity; remember that simply negotiating, executing, and implementing new transportation rates and pricing does not guarantee any benefit.

Concentrate on both simplifying and improving the acquisition of carriers while driving landed costs down either in an open or closed spot market for one-off shipments or heavily trafficked lanes. Your emphasis should also be on ensuring that all parties involved in supply chain transactions are aware of the most appropriate carrier at that moment and associated rules of engagement for any given shipment. Consider validating invoice veracity and supplier performance; look for business analytics and insights. Enforce compliance.


The Simpler, the Better

Managing the costs of moving goods through the supply chain is a huge challenge for shippers and consignees—these challenges are increasingly heightened in this environment. A single shipment involves inter-company and intra-company transactions and communications. Streamlining a supply chain is not easy, but the simpler the solution involved, the better.

Do something, act. Be smart, be bold, be nimble, and be well.

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Bringing End-2-End Efficiency to Your Logistics Operations



Mark McArthur

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With economic consequences from COVID-19 and other resulting challenges, companies are looking for ways to manage more efficiently with less—while reallocating resources to more productive activities and maximizing freight spend value.

Logistics operations are a great place to start, as even the smallest percentage savings could mean triple-digit impact to bottom lines. These operations are a significant cost center and therefore a great place to identify opportunities for improvement.

Q: *If looking to achieve End-2-End efficiency within logistics operations, where does one start?*

A: Start by looking at your supply chain holistically and build a digitization strategy. Once you've analyzed your logistics ecosystem to identify gaps or areas of data improvement, then start at the beginning of End-2-End workflows with procurement.

Building a trusted carrier network is imperative to the success of your logistics efforts. A freight procurement tool, like Alpega's TenderEasy platform, that enables freight tendering and spot bidding across all modes is essential to understanding current market value of carrier services; and, in times of disruption, the ability to go outside your established network to find additional capacity.

Q: *When we talk about improving logistics efficiency, we tend to think of transportation execution. Where does this fall within End-2-End workflows?*

A: A transportation management system (TMS) is a core component to facilitating improvement across all nodes of transportation workflows, inclusive of planning, execution, freight cost settlement, and analytics. Alpega TMS is modular and flexible, so companies can invest in a cloud-based solution in the areas they need most now with the ability to easily scale up or down later; as well as add additional functional capabilities.

Alpega TMS also connects carriers and other trading partners across logistics and supply chain networks through one platform—enabling real-time collaboration with features like automated load tendering and carrier acceptance. Other processes in the End-2-End system, like freight invoice reconciliation and analytics, are vital to close the loop.

Q: *With what type of technology investment do you see the greatest immediate impact on logistics operations?*

A: Probably dock appointment scheduling. Long carrier wait times and lack of visibility across warehouses and DCs have severe detrimental impacts on customer service levels and operations. Providing carriers the ability to make their own pick-up and delivery appointments via a cloud-based 24/7 portal saves time and confusion for both parties—and lets shippers redirect resources if needed. Time saved setting appointments manually could be used on exception management and operational efficiency.

The result is higher productivity overall. Alpega's dock appointment scheduling solution is a low-cost investment with a high rate of return, delivering rapid time to value. Its positive impact on logistics operations can be realized almost immediately.

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[INSIGHT]

LEANSUPPLYCHAIN

by Paul A. Myerson

Instructor, Management and Decision Sciences, Monmouth University, and author of books on Lean and the Supply Chain for McGraw-Hill, Pearson, and Productivity Press
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The Road Map Out of This Mess

For years, I have been a proponent of operating a lean and agile supply chain, but some now say the COVID-19 pandemic has revealed the shortcomings of a supply chain that is perhaps too lean.

To be “lean,” however, doesn’t mean maintaining extremely low inventory levels with no coordination or backup plan. It also appears some have forgotten the “agile” part, meaning you need flexible alternatives at the ready.

In any case, it appears that many companies and their supply chains were caught off guard by the COVID-19 crisis despite recent disasters such as the earthquake and tsunami in Japan, volcanic eruptions in Iceland, and hurricanes Maria and Harvey.

In my September 2017 article, “Global Supply Chain Risk: Don’t Wait, Mitigate,” I stated that in order to minimize risk in their supply chains, companies need to “first identify the sources and types of potential risk, and estimate their probability and impact.” Supply chain risks come from an array of potential sources, including global pandemics.

RISK MITIGATION STRATEGIES

To combat this type of scenario, companies should look to supply chain risk mitigation strategies that include boosting capacity, engaging redundant suppliers, increasing responsiveness and

flexibility, aggregating demand, and increasing source capabilities. Where appropriate, companies can also consider adding inventory by decentralizing the stock of predictable, lower-value products and centralizing the stock of less predictable, higher-value products (such as personal protective equipment and ventilators in our current case).

WHERE TO START

According to a 2013 Deloitte survey, while many company executives realized supply chain risk was an important factor in their decision-making, many didn’t feel their programs were effective. I don’t think things have changed much since then.

A good first place to start in the risk mitigation process is mapping your supply chain. Make sure you know the answer to questions such as:

- What are the physical locations of your suppliers’ manufacturing facilities and those of their suppliers?
- Which parts are manufactured at each location?
- What is the history and frequency of disruptions that occur at each facility and geographic region, due to either natural forces (hurricanes, floods,

earthquakes) or other factors (labor strikes, power outages, quality issues)?

Many sophisticated software tools are available to help map your supply chain. Smaller companies that can’t afford the investment can analyze their bill of materials and focus on key components.

WORK FROM THE TOP DOWN

This analysis typically starts with the top products by revenue, working down through their component suppliers and their suppliers, all the way to raw materials suppliers. The goal is to go down as many tiers as possible.

The map should also include information about which activities a primary site performs, alternate sites the supplier has that could perform the same activities, and the lead time for the supplier to begin shipping from the backup site.

Companies that invested in mapping their supply networks before the pandemic were better prepared with clearer visibility into the structure of their supply chains. The mapping gives them a vast resource of information at their fingertips within minutes of a potential disruption.

Mapping helps you determine which suppliers, sites, parts, and products are at risk, giving your company a better chance to secure constrained inventory and capacity at alternate sites. ■



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[INSIGHT]

IT MATTERS

by *Bruce Orcutt*

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It's Time to Digitize Your Back Office

Upgrading back-office functions may not be the sexiest subject when it comes to artificial intelligence (AI), robotics, and business automation but, according to IDC research, it goes the furthest.

Digitizing, automating, and optimizing document workflows reduces costs by more than 35%, say respondents to IDC's *Content Intelligence: For the Future of Work* report. They reduced the time spent on document-related tasks by 17% and reduced errors by almost 52%.

To accelerate growth and profitability, shippers need to eliminate manual back-office functions and integrate processing across the entire supply chain with carriers and other trading partners. However, knowing which processes to start with, and deciding what technology to use to automate, is often a challenge.

Intelligent process automation (IPA) can help organizations quickly ramp up digital transformation projects, according to IDC. IPA is a group of AI-enabling technologies, including content intelligence, that manages, automates, and integrates processes. This includes intelligent capture, optical character recognition, machine learning, and natural language processing.

Any content-centric process is a high-value target for automation. However, many executives make the costly mistake of embarking on a project based on

assumptions, bias, or opinion rather than facts. Many organizations think they know how their systems operate, when in fact, it is far from reality.

Before digitally transforming a business process, I highly recommend using a process intelligence tool that analyzes your systems in real time. The tool uses AI technologies to understand a process as a dynamic flow of interrelated events and measures, analyzes, and monitors time intervals and repeated actions. This will help you determine which processes to transform, why, and the expected ROI.

PRIORITY PROCESSES

The common processes that return the most immediate value for shippers are:

Accounts payable (AP). While it is important to digitize invoices, purchase orders, and sales orders to streamline the AP department, simple digitization is not where the real benefits lie. It is important to use content intelligence solutions that leverage machine learning to automatically extract, classify, and learn what to do with the data within structured and unstructured documents such as invoices. Only after

this information has been gathered and properly understood can it be sent to the next step within the AP automation process.

Customs forms. Rather than having staff manually review customs forms and transfer the data to your system, the technology can automatically extract tariff and product information for every line item in a shipment, thus saving time and eliminating errors.

Additionally, you'll be able to export any process documents automatically to electronic systems for filing via the automated broker interface.

Scheduling and logistics. Automation is crucial to optimize global sourcing, outsourcing, and subcontracting while managing complex, multisite operations and maximizing profits. This includes capturing and submitting proof-of-delivery documents with delivery receipts and signed bills of lading via mobile phones.

To ensure a solid start to digital transformation projects, create a center of excellence (COE) consisting of staff from the C-suite, IT, and business users. COEs evaluate which processes to target first, and typically leverage process intelligence, robotic process automation, IPA, and content intelligence. COEs deliver digital intelligence across the enterprise.

The path of digital transformation is not an easy one and must be carefully executed to ensure maximum ROI. ■



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[INSIGHT]

RISKS&REWARDS

by *Julio Casal*

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What's Lurking in Your Supply Chain?

You may think your company is well protected when it comes to cybersecurity, but an often overlooked source of vulnerability is your supply chain. If you can't honestly say you are fully apprised of the security postures of your vendors, partners, and contractors, then you are already at major risk of a cyberattack.

Up to 80% of all security breaches start in the supply chain, estimates a 2018 KPMG report. Alarming, 59% of global companies say they've experienced a data breach caused by one of their vendors—and in the United States, that climbs to 61%, according to a 2018 Opus and Ponemon Institute survey.

Consider Facebook and Target's recent breaches. Several third-party Facebook app developers accidentally exposed millions of users' credentials in 2019, and Target's attackers leveraged stolen network credentials from an unlikely sounding source—its refrigeration and HVAC systems provider. You are only as strong as your weakest link, so you must think beyond your internal network.

It is a common misconception that criminals are interested only in larger companies. My firm's 2019 Identity Breach Report finds that cybercriminals are shifting their focus to target more small businesses. Nefarious actors recognize that smaller companies likely do not have adequate budgets to allocate to cybersecurity, but still hold valuable assets,

and they use to their advantage small to mid-sized businesses' assumptions that they are not worthy targets.

Cybercriminals will exploit your weak supply chain if you are not prepared. They will infiltrate their primary target by attacking its partners (who have access to the target's sensitive data). According to Carbon Black, 50% of attacks use "island hopping," in which a bad actor launches an attack against the company's partner network as a key tactic.

HOW TO FIGHT BACK

What steps can your organization take to prevent these attacks? Start by assessing and vetting your internal and external business partners.

Whether hiring a new contractor or forming a new partnership, conduct a thorough background check and look for red flags. Do these companies follow best practices and implement adequate protections?

More companies are also starting to add language in contracts about cybersecurity to ensure their supply

chain's cyberhygiene is up to par. Enforce reasonable standards of security; if partners can't meet these standards, then they will have to face the consequences.

Third-party audits are another vital way to make sure your partners and vendors are compliant.

Each industry maintains its own regulatory compliance requirements and certifications. Organizations such as SecurityScorecard can oversee risk assessments that independently provide security scores for vendors. Even smaller companies should perform these risk assessments annually at minimum.

Finally, track and maintain an inventory of companies and individuals that access every type of sensitive data your company requires. You may find that certain parties can view data they don't need for their roles. Your organization loses control when you cannot assure the chain of custody of any business data.

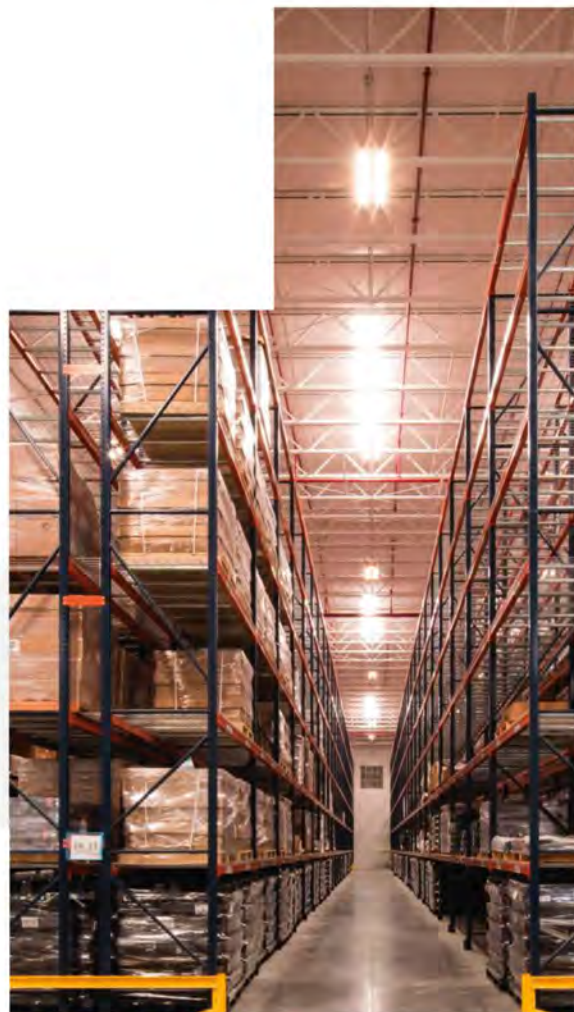
Should you or a supply chain partner suffer a breach, swift response is important. To respond rapidly, you must already have created a comprehensive and partner-aware incident response plan to make sure you are on the same page as every link in your supply chain.

Your company's risk extends beyond your own company. Proactively address issues with your supply chain before it's too late. ■



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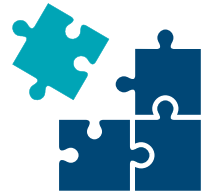
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Supply Chain Challenge? **SOLVED**



Bolstering Customer Experience in the Supply Chain

3PL MD Logistics becomes an integral part of retailers' supply chains, focusing on two types of customer experiences: the retailers' and their customers' experience.

THE CHALLENGE

Customer experience is a vital part of a consumer's purchase journey and is unique to each retailer's brand. As a 3PL, we have two types of customer experiences we are focused on: our customers' experience and their customers' experience. Acting as an extension of our customers' team and as an integral part of their supply chain, it is imperative that we not only focus on their needs, but also the needs of their customers.

With multiple procurement channels available, it is just as important for brands to ensure their customer experience is the same across all channels as it is to make sure that there is brand consistency in every item the consumer purchases.

THE SOLUTION

At MD Logistics, our internal company culture creates a positive experience for both our customers and the end consumer. Since 1996, our mission has remained constant: Take care of the customer. By creating a culture of transparency, we've been able to partner with companies that are like minded and are looking for a long-term supply chain partner.

Creating this culture of transparency is driven from the top, down. Keeping an open line of communication between all management teams creates



alignment and allows all members of the team to remain informed of potential business opportunities and outstanding customer requirements. This communication style also sets expectations and creates a culture of accountability, which leads to higher performance outcomes.

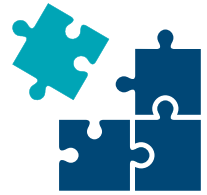
Our unique approach to account management is focused on empowering our team to be decision-makers, allowing for a quick reaction time, should issues arise. In addition, our executive management team makes themselves readily available to all customers, in the event that topics need to be discussed further.

As an extension of our customers' teams, we understand the importance of upholding their brand requirements. As a result, we often host our customers for on-site workshops, providing our team with brand- and product-specific training to ensure customer experience expectations are met for the end consumer.



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Supply Chain Challenge? **SOLVED**



Fortune 500 Retailer Finds Cost Savings, Improves Performance with Data Solution

With RateLinx's TracLinx module, an electronics retailer boosted the accuracy of its shipment tracking data, gaining real-time visibility for data-driven insights into its logistics performance.

THE CHALLENGE

In today's largely disrupted environment, companies everywhere have been forced to look for increased performance in service and cost. Data consistently plagues these initiatives as manual processes affect its quality, accessibility, and timeliness. A data-driven logistics technology solution provider can deliver insights to drive breakthroughs in service and cost, while delivering real-time visibility into shipping, tracking, and invoicing.

A Fortune 500 electronics retailer needed to solve errors in tracking data causing incorrect shipment ETAs. As a result of the inaccurate ETAs, the team could not plan appropriate staffing levels, causing elevated costs, excess stock, and operational inefficiencies. They hoped that with accurate ETAs, they could improve efficiencies, costs, and staffing imbalances.

The retailer worked through a Cost-Savings Assessment with RateLinx to identify raw tracking data issues that were causing incorrect ETAs and develop solutions to improve their performance.

During the initial assessment, RateLinx found shipment milestone updates were lagging on 43.8% of the shipments and missing completely on more than 30% of the shipments. Other times, incorrect or missing location updates were being received from the carrier. Exceptions in the freight payment process were

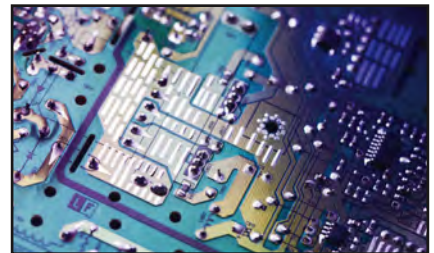
occurring on 35% of their shipments due to tracking milestones being out of sequence. These errors were causing additional overhead with non-value-added manual work to correct exceptions.

THE SOLUTION

The retailer needed to resolve tracking data issues, reduce non-value-added manual work, improve working capital, and balance personnel. The company desired improved ETA accuracy, visibility, and clean data to supplement its existing TMS.

RateLinx's TracLinx module was used to resolve tracking milestone anomalies and correct sequential issues in real time. TracLinx's AI identified the location updates deemed outliers and the RateLinx data quality team worked with the carrier to fix them. Tracking milestones were properly sequenced by TracLinx, which enabled the TMS to properly generate a voucher to pay the invoice.

Connecting the cost of service to the tracking data, rate-modeling was used to determine performance improvement opportunities, such as adding specific carriers that align with the retailer's network requirements. The modeling revealed better carrier lane alignment, placing freight that better matched the carrier's preference. The adjustments created sustainable savings while improving the shipper-carrier relationship through cost and service optimization.



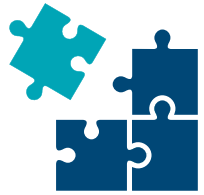
RateLinx completed the deployment of TracLinx in less than 45 days without internal IT resources, and integrated directly with the retailer's TMS. The system identified sustainable savings of more than 16%. The improved dataset powers foundational KPIs and reporting in a cloud-based dashboard that continues to highlight savings opportunities for the customer.

Exceptions are handled automatically, and improved efficiency reduces costs. The RateLinx data quality team continues to work collaboratively with the carriers to prevent and rapidly resolve invoice and tracking issues. As a result, the retailer can make better logistics decisions with credible results and use reliable data to drive other initiatives.

RateLinx

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Supply Chain Challenge? **SOLVED**



Providing Solutions Through Unprecedented Times

With the demand for essential supplies skyrocketing across the country, Hub Group's collaboration with retailers has helped suppliers deliver critical loads quickly and safely.

As the country continues to navigate the impact of COVID-19, many supply chain professionals work tirelessly to keep retail shelves stocked so the population has access to necessities. Supply chain organizations have had to quickly mobilize, band together, and comply to new rollouts—all while keeping lines of communications open to align stakeholders.

In order to deliver effectively during turbulent times, Hub Group has relied on its seasoned emergency response teams, strategic network of providers, and rooted retail relationships to help customers pilot through this unforeseen climate.

THE CHALLENGE

With the increased demand for essential supplies across the country, Hub Group's collaboration with multiple retailers has helped suppliers deliver critical loads with speed and safety. Delivering these kinds of shipments can put heavy demands on any company, and given the impact of COVID-19, Hub Group's teams have aided these supply chain challenges with prompt action and leading customer service.

One retailer faced many challenges with their vendors delivering time-sensitive loads with the precision needed to serve their customers. As one of the nation's largest home improvement retailers, the company needed a solutions

provider that was equipped to handle the volume amidst the just-in-time climate. Considering Hub Group's history of delivering time-sensitive loads for the retailer, the company was confident Hub Group could deliver again and selected us as the single provider to manage all critical shipments.



THE SOLUTION

So far in 2020, Hub Group has moved more than 500 emergency shipments for the retailer, with consecutive weeks of transporting loads 24/7. Hub Group's cross-functional team support, stemming from Account Management all the way to Over-the-Road (OTR), Intermodal (IML), and Dedicated operations, developed processes that supported the retailer's volume with unmatched efficiency.

This is just one example of Hub Group's time-sensitive retail solutions. However, it's important to note that while processes are vital to deliver during times like these, it's the relationships within a strategic network of providers that stand as the pillar for crisis management.

Hub Group continues to work closely with both customers and retailers alike during these unprecedented times to help prioritize shipments and allocate inventory accordingly. With a hand in both warehousing and transportation, Hub Group has the power to align both parties to coordinate the incremental growth caused by the COVID-19 climate. Our teams have worked around the clock to meet the surge in demand while also keeping consolidated loads shipping on time throughout this process.

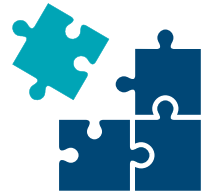
In order for the economy to keep moving, it truly takes a village to make sure the public receives the essential items they need. At Hub Group, we aim to try to play our part by assuring we can deliver with speed and precision in a safe manner for all parties.



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Supply Chain Challenge?

SOLVED



Efficiencies and Revenues Skyrocket for Distributor with Digital Order and Logistics Management

MPO's cloud platform for order and logistics management allowed an agricultural spare parts distributor to streamline fulfillment, obtain full order visibility, and reduce shipping costs for customers.

THE CHALLENGE

Managing a highly complex supply chain network is no easy feat. When one of Europe's largest distributors of agricultural spare parts decided to transition to a digital supply chain, they enlisted MPO to the task. At the time, the company ran 11 distribution centers (DCs) serving more than 40,000 customers in multiple countries, where quick and reliable deliveries were critical.

While experiencing high growth levels, with increasing order volumes and more than 150,000 order lines per day, the distributor was also integrating a new acquisition into their core business. They needed a smarter and more efficient way to gain order visibility, manage data exchanges between their 40-carrier network, control costs, and fulfill their mounting orders at high speed and with pinpoint accuracy.

THE SOLUTION

Leveraging MPO's cloud platform for order and logistics management, the distributor was able to seamlessly connect their ERP and WMS systems. This allowed them to instantaneously receive orders on a single platform and thereby plan and execute orders with greater agility and precision.



MPO's platform also helped streamline fulfillment. By analyzing factors such as routes, carriers, capacities, rates, and service level agreements, the platform could consistently optimize shipping costs and efficiently consolidate orders from their 11 DCs to a local hub for last-mile delivery.

Moreover, because the MPO platform calculates transport costs per item, per shipment, and per customer, it allowed the distributor to not only reduce internal costs, but to also keep shipping costs competitively low for their customers.

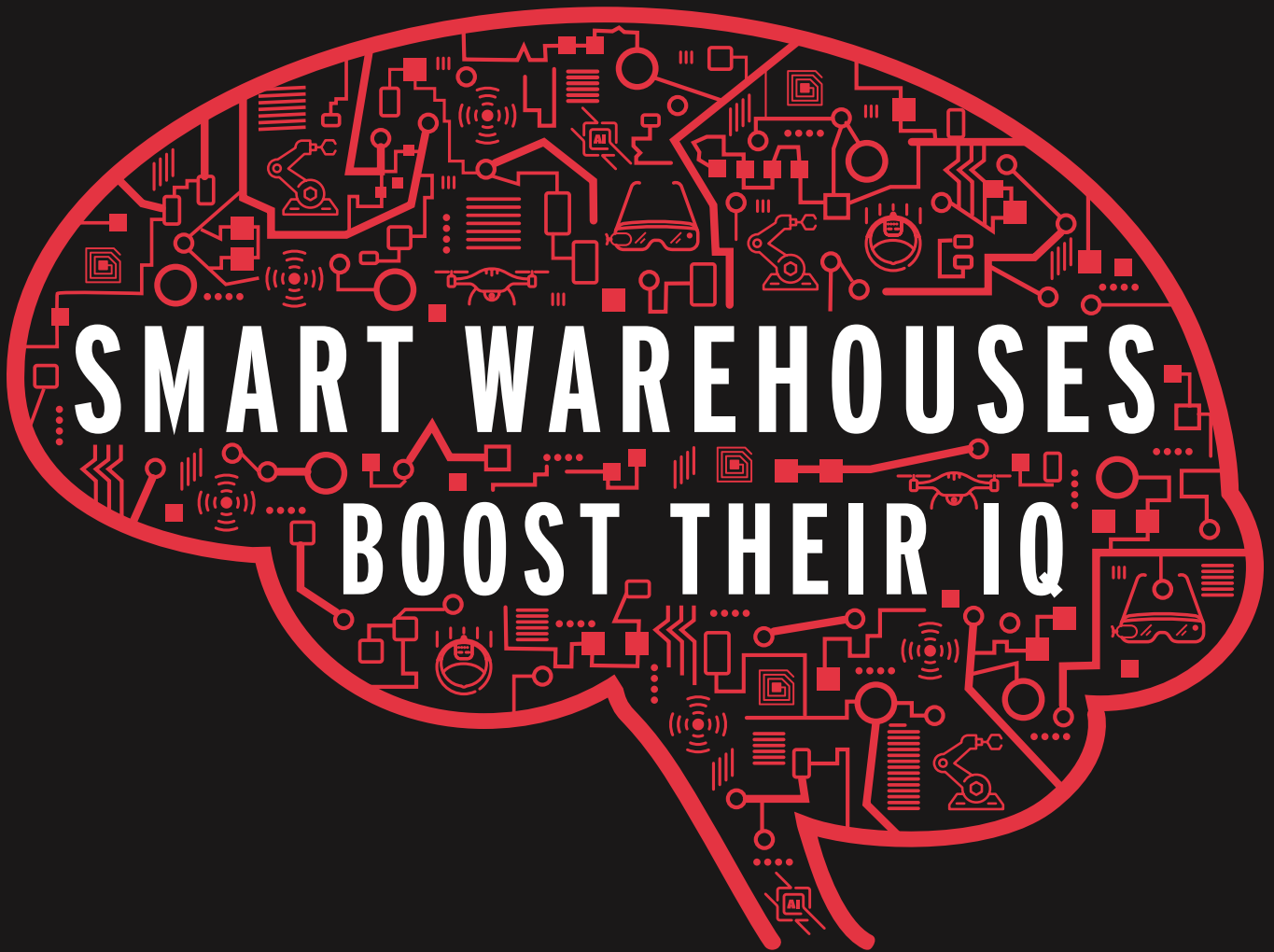
By standardizing carrier communications and data formats, MPO was also able to help the distributor better leverage their multi-carrier

network and obtain full order visibility for their customer orders. The order and logistics management platform provided carrier-specific labeling that could essentially be generated in real time to meet the distributor's high-speed requirements. Once affixed to the appropriate boxes, these labels would be scanned on pallets and trucks, allowing customer service representatives to easily track them.

Having such full visibility of boxed items, pallet items, and orders in transit proved immensely valuable for keeping up with customer demands and providing higher levels of customer service. To continuously keep costs in check, the MPO solution also processed and matched carrier invoices to the pre-calculated agreements. As a result, the distributor managed to significantly boost efficiencies and revenue growth.



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Implementing IoT, AI, drones, and other intelligent digital solutions in your warehouse is a brilliant move.

BY MERRILL DOUGLAS

Warehouses keep growing smarter, and much of that IQ boost comes from technologies that interact with warehouse management systems (WMS). All on its own, a WMS can bring a warehouse operation a game-changing level of intelligence. Today, though, companies are using solutions based on the Internet of Things (IoT), artificial intelligence (AI), robotics, and other digital technologies to extend the advantages of a WMS even further.

Here's a look at some of the best and brightest digital developments in warehouse management.

THINK TWICE ABOUT ROBOTS

Robots in the warehouse take many forms, including traditional automated storage and retrieval systems (ASRS)—fixed systems that perform a specific task, such as piece picking, in one spot—and autonomous systems that move from place to place.

OPEX Warehouse Automation combines intelligent mobile robots with ASRS technology in two warehouse solutions: the Perfect Pick goods-to-person picking system and the Sure Sort solution for sorting small items.

Both systems can exchange data with any WMS through an application programming interface (API). And both incorporate OPEX's iBOT, a multidirectional vehicle with wireless communications that transports product from place to place.

Perfect Pick, a high-density racking system, uses iBOTs to move product both horizontally and vertically.

"iBOT robots navigate along an integrated track system, retrieving, storing, and sorting inventory items quickly and accurately to or from an array of order and storage locations," says Monty McVaugh, engineering project manager at OPEX.

The Sure Sort robotic item sorter delivers parcels and single items to their final location in a single pass.



Sure Sort provides high-speed, automated sorting. "The Sure Sort iBOT picks up and loads individual products, or 'eaches,' that are placed on an infeed conveyor, which is inducted by a human or robotic automated system," says McVaugh. "The product is then sorted and assigned to the appropriate bin. It then repeats this operation."

Robots are common in warehouses these days, and one facility might use several different systems for different functions. Unfortunately, each robotic system has its own proprietary software for communicating with the WMS, and connecting several systems at once could cause conflicts.

Kenco hopes to solve that problem. It is working with SVT Robotics, which has built a middleware platform that takes input from all the different types of robots, connects to the WMS one time, and optimizes the parsing of work to the different robots.

Developers at Blue Yonder hope to build a similar capability into the company's own WMS. The current working name for this feature is "task orchestration," says Matthew Butler, director of industry strategy at Blue

Yonder. "It allows us to use cloud computing power to understand the relationships between warehouse tasks, whether they're performed by a robot or by humans."

Analyzing all the work the warehouse needs to accomplish, the resources available, and deadlines for filling various orders on time and in full, the technology would assign tasks to resources as effectively as possible.

Blue Yonder's system would also pull in data from robots as they went about their work on the warehouse floor. "That way, we can more holistically orchestrate, knowing their availability and the inventory that they have, which orders should be allocated to one zone or another, one robotics provider or another, with the objective of accuracy and speed," Butler says.



HEADS-UP

For humans in the warehouse, new head-mounted display systems use augmented reality technology to deliver instructions from a WMS while leaving hands free to work with inventory. One such product is Zebra's recently introduced HD4000 wearable unit.

Used with Zebra's FulfillmentEdge software, the HD4000 helps new warehouse associates learn their jobs quickly, and it improves productivity for all associates, says Mark Wheeler, director of supply chain solutions at Zebra. "It's intuitive, and our early proof-of-concept shows it can reduce onboarding time up to 90%."

Kenco recently implemented a vision-picking system from LogistiVIEW, which includes augmented reality glasses from Vuzix. It added this technology to help a customer bring picking accuracy to 100% and to improve service to its retailer customers.

The system improves accuracy by providing visual cues. "As an associate walks up to a rack full of product, it highlights the right location in green and all other locations in red," says Kristi Montgomery, vice president of innovation, research, and development at Kenco. After each pick, the system provides a voice confirmation. "If they happen to pick the wrong product, it throws a big, red X over it and waits for them to pick the right product."

WAREHOUSE TECHNOLOGIES TO BEAR IN MIND

• **Supply chain insight.** As companies collect and synthesize more data about customer demand and the status of inventory at any point in the supply chain, they can make better decisions about activities in a warehouse.

“Getting comprehensive, end-to-end visibility allows you to think more holistically about what you should do in the warehouse,” says Matthew Butler of Blue Yonder. “How proactively can you anticipate order item availability so you can prepare order volumes and start thinking about cubing out your trucks?”

Butler calls that capability “demand chain insight” or “end-to-end supply chain insight.” It requires a company to combine demand forecasting signals, from a variety of forecasting tools, with inventory status data that is as current and detailed as possible.

“We’re looking to better leverage upstream demand projection signals, out of stocks, and the value of the product and its impact on the bottom line,” Butler says. That information will drive decisions about which products to unload first, how to prioritize crossdocks, and how to replenish product lines more aggressively.

• **Digital twins.** For years, planners have used modeling and simulation software to test potential operational strategies without making physical changes to a warehouse.

Today, however, software exists that takes modeling one step further, building a “digital twin” of a warehouse. The digital twin software runs multiple “what-if” scenarios, uses AI to evaluate the results, and then applies those evaluations to current operations.

“Digital twin software can make real-time recommendations to a warehouse,” says Jeremy Tancredi, director of operations excellence and supply chain management at West Monroe Partners, a Chicago-based management consulting firm.

For example, as trucks bring inventory toward a facility, the software might determine the best way to handle that inbound product, and then instruct the WMS to change certain rules to implement that plan.

“Warehouse managers use the software to make operational decisions, not just as an engineering design tool,” Tancredi says.

AI PROVIDES BRAIN POWER



As IoT sensors give WMS solutions more data to work with, AI gives them greater analytic power. “Many WMS vendors have been trying to add more AI decision-making algorithms in their software,” says Jeremy Tancredi of West Monroe Partners.

For example, AI could bring more subtle reasoning to decisions about where to place product. WMS solutions have traditionally looked for slots that fit the size of various pallets, and also tried to group similar pallets—putting together all the canned soups, for instance. But AI might recognize ordering patterns that should influence put-away processes.

“Every time soup is ordered, for example, crackers are ordered as well,” says Tancredi. An AI system might also recognize the need to group marshmallows near hot chocolate during the winter, but near graham crackers and chocolate bars during the summer, he says.

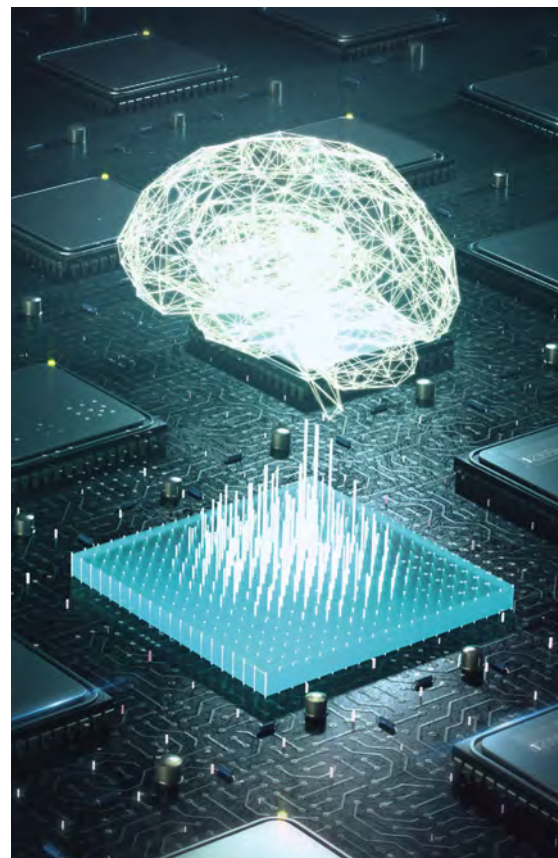
As IoT sensors can detect the need for maintenance on mechanical systems, AI can use data from those sensors to predict problems before they occur.

“The AI starts to recognize patterns, such as, ‘What did that shuttle look like right before it broke down?’” says Tancredi. By prompting crews to perform preventive maintenance, predictive analytics could help avoid shutdowns.

In warehouses that use robots, AI transforms those systems from machines that passively take direction from the WMS to smart systems that adjust their work based on real-time conditions.

“For example, their sensors identify other robots in the same pick area,” Tancredi says. “So they resequence their order and travel in a different manner to avoid those areas of high congestion.”

As a robot optimizes the picking process, it sends information about the revised route back to the WMS.





RFID IN THE WAREHOUSE: A NO-BRAINER

“There is a long-term trend toward implementing the Internet of Things into the warehouse,” says Mark Wheeler of Zebra Technologies in Holtville, New York. That includes more extensive use of radio frequency identification (RFID) for data capture.

One recent advance is the use of passive RFID tags—which do not require batteries—with wide-area readers that capture data from across about 1,600 square feet.

Zebra’s new wide-area reader, the ATR7000, can determine the location of any tag within a few feet, keeping the WMS aware of an item’s

status in the warehouse at all times, not only when it passes through a dock door or another portal.

“Passive technology enables us to put a low-cost, single-use tag on materials and extend real-time visibility down to that level,” Wheeler says.

Backed by this technology, a WMS could, for instance, prioritize the handling of different items on a receiving dock.

“Not only can I know what’s there without requiring someone to scan to a staging area, which they might or might not do properly, but I can have

rules to act on based on what’s happening on the floor,” Wheeler says.

For example, if the system detects products that demand an unbroken cold chain, the WMS can instruct associates to move those items to refrigerated storage before performing other tasks.

In another IoT application, Zebra’s SmartPack Trailer uses a video camera and a light detection and ranging (lidar) sensor to build a three-dimensional record of freight as associates load it into a trailer. Rather than rely on a supervisor

to oversee the process in person, a company can evaluate performance based on data from the system.

“You can generate alerts based on predefined criteria, such as a particular trailer being loaded at low cube utilization,” Wheeler says. “That’s a coaching opportunity for the loader.”

IoT sensors on equipment in a warehouse can provide data to predict when a machine will need maintenance or new batteries, says Matthew Butler of Blue Yonder in Scottsdale, Arizona. The WMS can incorporate that information in its planning.

DRONES DO A HEAD COUNT

RFID readers and other IoT sensors on drones are starting to appear in the warehouse. RFID-reading drones can possibly be used for cycle counting.

“You may miss some product if you do manual cycle counts,” notes Jeremy Tancredi of West Monroe Partners. “But if you send a drone through the warehouse, it will pick up the RFID frequency and find that pallet that you thought you lost weeks ago.”

In its Innovation Lab, a 10,000-square-foot test facility in Chattanooga, Tennessee, third-party logistics (3PL) provider Kenco has been investigating the use of drones for cycle counting. Working with a drone development startup, Kenco plans to start pilots of the system in several of its own facilities by late 2020.

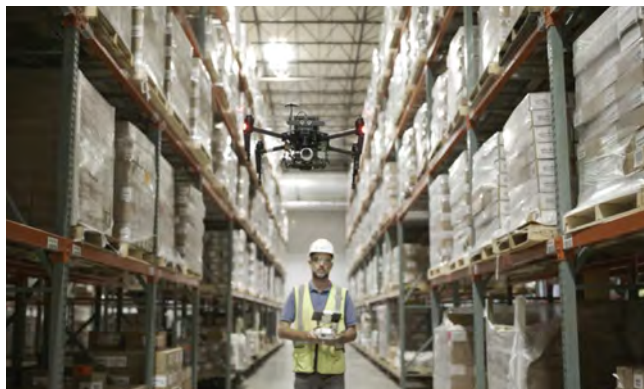
“Using machine learning, AI, and IoT in combination with Wi-Fi technologies, drones are becoming quite powerful,” says Kristi Montgomery of Kenco. The newest systems can find their own way around a warehouse, eliminating the need to install location markers. These drones also incorporate cameras that can read both barcodes and alphanumeric characters.

All the drones can recognize a pallet, but some will soon go even further. “Several startup companies are working to be able to count how many cases are on that pallet and



understand what product is on the pallet,” Montgomery says. In the near future, their drones will also be able to detect and account for a second pallet stored behind a first, she adds.

In addition, Kenco’s partner in its pilot program is developing a drone that can change its own battery by dropping the spent battery into a charging dock and picking up a fresh one.



Third-party logistics provider Kenco is experimenting with ways to use RFID readers on drones to perform inventory cycle counts and pallet management.

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THE NEXT GENERATION OF WAREHOUSE LABOR

WORKING SIDE BY SIDE, ROBOTS AND HUMANS REINVENT WAREHOUSE WORK.

BY KAREN KROLL



At the Wurth Adams warehouse outside Minneapolis, Minnesota, a shuttle system brings products to employees, who then pick the items they need to complete their orders.

“It’s a goods-to-human system,” says Ken Misch, managing director of operations for the west region. Wurth Adams is part of Wurth Industry North America, a global distributor of fasteners.

Because they don’t have to walk to find each part—previously, workers would chalk up miles every day picking products from more than 100,000 locations within the warehouse—employees at all six picking stations complete between 150 and 200 picks per hour. “Picking efficiency is about 10 to 1 versus the previous method of going to a location, picking, and then driving back,” Misch says.

The work is also physically easier and safer. The shuttle system has eliminated much of the twisting, bending, and reaching previously needed to pick items.

In another change, employees “need to understand systems more, and be able to work on computers,” Misch says. In the past, having computer skills typically was less of a requirement for many warehouse positions.



At Wurth and elsewhere, technology is changing the nature of many warehouse jobs. It often reduces physical demands. Some technologies reduce the need for employees or consultants to be on-site—critical in a time of social distancing. At the same time, advancing technology often requires different skills, including knowledge of computer and machine systems.

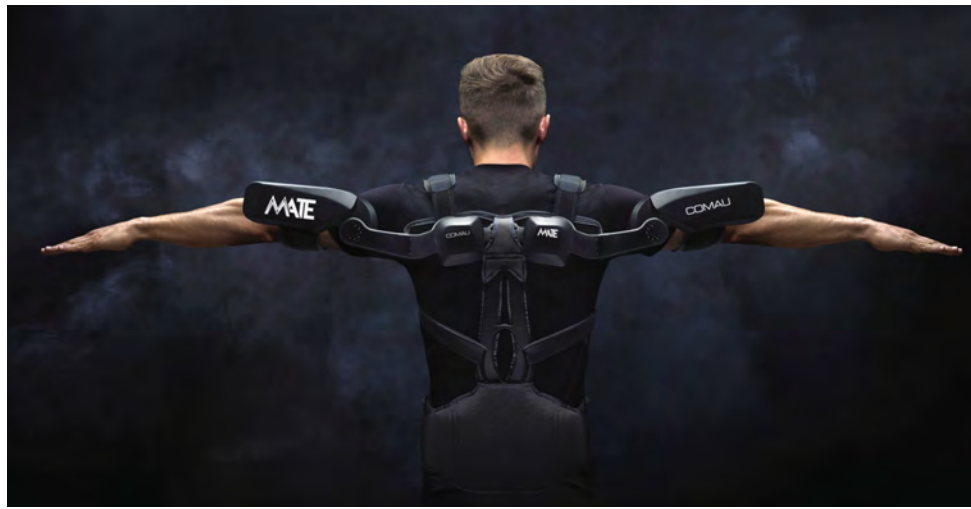
It's a shift to "hu-manufacturing," says Duilio Amico, marketing and network development director for robotics and automation for Comau, a Turin, Italy-based provider of industrial automation solutions.

The word—a mashup of human and manufacturing—reflects the strengths and limitations of each. Automation technology offers speed and strength and can easily handle repetitive, physically demanding tasks, but the systems can be rigid and inflexible.

"We need to combine the dexterity and flexibility of humans with the speed and ability of machines," Amico says.

Not surprisingly, e-commerce is driving this change, as it has shifted a lot of warehouse work from pallets to individual orders. "The idea of shuttling individual parts to workers isn't new, but the energy, investment, and design work has come about in the past five to seven years because of e-commerce," notes Bryan Jensen, chair and executive vice president with St. Onge Company, a supply chain engineer and advisor.

More recently, concerns about COVID-19 have accelerated this shift.



In their efforts to implement social distancing guidelines, warehouse managers are working to "become more digital and find different ways to order and receive products," says Christian Dow, executive vice president of membership and industry leadership with MHI, a materials handling, logistics, and supply chain association.

BOOSTING WORKER EFFICIENCY

Digital supply chains, using technologies such as robotics, wearables, and autonomous vehicles, will be the dominant supply chain model within the next five years, according to 80% of the supply chain professionals who responded to MHI's 2020 Annual Industry Report.

A big reason for this interest is the boost technology can provide to

Comau's MATE exoskeleton can replicate any shoulder movement to provide workers with consistent and advanced assistance during overhead tasks.

worker efficiency. Autonomous mobile robots (AMRs) can take over aspects of warehouse work that are tedious or dangerous, says Stefan Nusser, vice president of product with Fetch Robotics. Like shuttle systems, AMRs often are deployed to find and move items to be picked, eliminating much of the time employees would otherwise spend traversing the warehouse.

Another benefit: Because AMRs are programmed to know where products are located, they can help seasonal warehouse workers become productive quickly.

Advances in artificial intelligence (AI) are helping robots more adeptly manipulate different items within warehouses. It's not difficult to build a robot that can pick one item. However, e-commerce orders can include a grab-bag of products. "To handle a huge diversity of items, you need a robot with intelligence," says Peter Xi Chen, co-founder and chief executive officer with covariant.ai, a developer of universal AI for robots.

Innovation is also occurring with wearables that boost efficiency, such as augmented reality glasses, as well as voice and/or visual pick solutions.

One company Dow worked with implemented wearable computers that directed employee picking as well as a

VIRTUAL ASSESSMENTS

By combining GoPro cameras and tablets, consulting firm enVista is conducting "virtual operational assessments" to help clients optimize their workforce and operations—all from a distance. "With the stay-at-home orders due to COVID-19, we're trying to be creative," says Tom Stretar, vice president at enVista.

For instance, enVista works with a beverage distributor that's realigning operations due to dramatic increases in sales as more consumers shelter in place. enVista equips the client's employees with GoPros and tablets, which they use to conduct a "virtual walk-through" of their operations. Using information gained from the walk-throughs, as well as from facility blueprints, enVista can recommend process improvements. Not only does this help everyone comply with social distancing rules, it also cuts travel costs.

gamification app that let employees see how the picking speed of their group compared to others. Their competitive spirits kicked in, and productivity rose by 20%.

The move to intuitive touchscreen user interfaces within many wearables allows even new workers with little warehouse experience to become productive quickly, says Mark Wheeler, director of supply chain solutions with Zebra, a provider of mobile computing solutions.

ENHANCING SAFETY

In 2018, the warehousing and storage industry experienced 5.1 nonfatal injuries and illnesses per 100 employees, according to the U.S. Bureau of Labor Statistics. That compares to a rate of 3.1 for all industries.

Technology can bring that number down, reducing both the human and financial cost of injuries. Goods-to-persons solutions, such as AMRs and AGVs, generally mean workers lift fewer objects, and those they do lift tend to weigh less. They're also more likely to maintain proper form. These features can lead to fewer injuries and potentially lower worker's compensation costs, says Ed Romaine, vice president, marketing and business development with Conveyco Technologies, a materials handling system integrator.

In addition, shuttle systems and AMRs are typically designed with ergonomics and safety in mind. Moving parts are

JUST ASK THE RIPPEY

While many warehouse technologies focus on picking, packing, and similar functions, responding to customer inquiries can also consume employees' time. Rippey, a response bot geared toward the logistics sector and powered by machine learning and natural language processing, provides automated answers to common questions, such as, "Where is my shipment?"



Rippey can automatically respond to about 80% of email queries, says Matt Motsick, chief executive officer with RPA Labs, the company behind Rippey. All queries it doesn't understand move to a customer service representative.

guarded, and the height and positioning of products and totes minimize movements that can lead to repetitive-motion injuries.

Exoskeletons also can help reduce fatigue and injuries stemming from repetitive movements. While currently more common in manufacturing, use within warehousing and logistics will grow, Amico predicts.

For instance, lower-limb exoskeletons brace employees' backs when they're lifting heavier objects and "force proper posture," he says. That can reduce the chance of injury.

As systems such as shuttles and AMRs increase picking rates, more warehouse employees are "experiencing upper body sprains from the increased repetitive motion," says Joseph Zawaideh, vice president of marketing and business development with Levitate Technologies, which offers the AIRFRAME exoskeleton. An upper body exoskeleton reduces shoulder, neck, and back fatigue for employees whose work requires repetitive arm movements.

Automation also can help design a warehouse that enhances social distancing. Because automation reduces walking, it also decreases the likelihood employees will inadvertently cross paths with coworkers. "It's often possible to place workstations at least six feet apart, driving social distancing between associates," Jensen says.

Technology can also enhance safety through better training. Warehouses can use virtual reality, augmented reality, and simulation technology to

offer training that's comprehensive, yet holds little risk of injury. "Virtual reality training allows realistic training with the capability to simulate countless more operating scenarios than can be covered during traditional on-the-job training approaches," says Thomas Boykin, supply chain specialist leader with Deloitte Consulting.

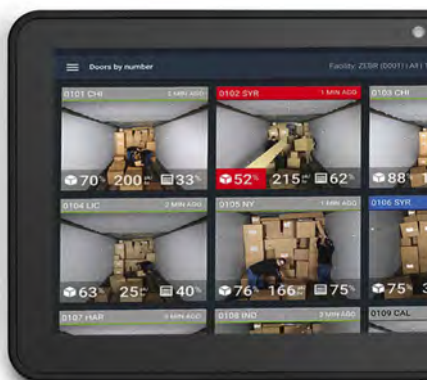
While technology is often thought of as appealing mostly to young people, it can make warehouse jobs more appealing to employees of all generations. To be sure, technology can help attract and retain younger workers "who expect a level of digital consciousness," Boykin says. At the same time, by reducing the physically demanding elements of many warehouse positions, technology opens them to older workers or those with physical limitations.

Moreover, many of today's warehouse technologies require workers with a wider range of knowledge, including engineering and programming skills. "It's a technology role, versus just picking," Dow says. This change also appeals to many potential workers.

THE FLIP SIDE OF TECHNOLOGY

Not all warehouse jobs will magically transform. While automation may eliminate much of the walking that has characterized many warehouse jobs, some jobs now may require an individual to stand in place, pick items, and send them on their way. "It still can be monotonous," Jensen notes.

Another concern that inevitably arises when discussing automation is the potential impact on the number



Zebra's SmartPack Trailer planning solution provides real-time operational visibility into loading operations.



Scalable and reconfigurable, the Agile AGV from Comau facilitates core operations and improves warehouse efficiency.

of workers needed. Few envision completely automated warehouses with no employees — three-quarters of those who responded to Zebra Technologies' 2024 Warehousing Vision Study say human interaction remains part of their optimal operational balance.

"Even though I'm bullish on technology, robots can't work without human help," Chen says.

At the same time, it's possible the workforce will shrink. For instance, Chen foresees a future in which employees supervise fleets of smart robots that do repetitive work. While employees will be needed, it may be possible to run some warehouses with skeleton crews.

Technology can also help companies grow, minimizing the need to cut headcount. At Wurth Industry North America, the goal of adding technology is to accommodate more business. "We get more efficient to drive more business," Misch says. ■

LEAN, MEAN ROBOTIC MACHINES

When you are ready to explore robotics platforms, the following companies provide a good place to start.

6 River Systems

www.6river.com
866-602-4825

Through collaborative robots, AI, and machine learning, 6 River Systems empowers operators to transform the fulfillment workflow. The company's robot, Chuck, enables dense, optimized pick paths, and leverages associate positioning to reduce walking in the warehouse by 50%.



Ambidextrous

www.ambidextrous.ai
512-731-9442

Ambidextrous builds AI-powered robotic solutions for flexible piece picking. Robotic workcells are built on state-of-the-art AI software that enables robots to pick and pack products without object-specific training. The configurable workcells support a variety of robot arms, grippers, and totes to service applications, including kitting, AS/RS picking, and order consolidation.

Brain Corp

www.braincorp.com
858-689-7600
Original equipment manufacturing partners license Brain Corp's robotic

AI software, BrainOS, to create autonomous mobile robots that can operate safely in dynamic indoor public spaces. BrainOS currently powers robots that clean hard and soft floors, and is expanding into new applications such as shelf analytics and material delivery. The autonomous delivery robots can operate across a variety of complex indoor spaces, enabling seamless transportation and delivery of goods.

Compact Automation

www.compactautomation.com
864-647-9521

Compact Automation offers a diversified line of workholding products including magnetic grippers for nonferrous pick and place applications, parallel and angular grippers, and twist cylinders. These products work in harmony with the robot to make complicated and repetitive work easier.

Eurotec

www.lowpad.com
31 (0)184 69 11 05

Eurotec offers the Lowpad, a smart autonomous mobile robot suitable for transporting all types of load carriers.

The Lowpad can be operated without adjusting a warehouse's existing infrastructure, and certified sensors guarantee safety.



Fetch Robotics

www.fetchrobotics.com
408-300-9056

The Fetch Robotics platform deploys safe, reliable, and versatile autonomous mobile robots



(AMRs) in manufacturing, fulfillment, and distribution environments within hours. Its fulfillment solution integrates with optimization engines to dynamically orchestrate workers and robots across piece, case, and pallet workflows. Fetch AMRs enable collaborative picking for multiple orders and a range of items.



FORT Robotics

www.fortrobotics.com
267-515-5880

FORT Robotics recently launched Oversight, a full-stack platform designed to help users of autonomous and robotic systems reduce risk, mitigate threats, and stay in control. The platform includes a robust remote control with built-in emergency stop, ideal for use with AGVs or autonomous fork trucks.

ForwardX Robotics

www.forwardx.com
619-818-6636

Offering a visual collaborative mobile robot with fleet capabilities, ForwardX provides automation solutions to help traditional businesses digitally transform to meet the requirements of modern consumers. On average, customers have seen important labor costs

decrease by up to 50%, productivity double or triple, and ROI achieved in less than two years.

Fox Robotics

www.foxrobotics.com
408-329-2422

This startup, based out of Austin, Texas, has successfully engineered and built autonomous forklifts that can unload trailers.



GreyOrange

www.greyorange.com
833-997-6268

The GreyOrange Fulfillment Operating System combines AI-driven GreyMatter software and intelligent Ranger robots to drive deeper data, dynamic decisions, and demand-driven delivery. GreyMatter applied science autonomously orchestrates data, rapidly responds to real-time events, and flexibly prescribes actions while augmenting workforce intelligence to continuously calculate and execute the next best fulfillment decision.

Honeywell Intelligrated

www.intelligrated.com
866-936-7300

Honeywell Intelligrated, a robotics development and systems integrator, provides mobile robots and robotic unloading and palletizing. Honeywell is collaborating with the National Robotics Engineering Center to develop a next-generation architecture to control and operate



multiple robotic applications using machine learning to enable critical decision-making capabilities, intelligent motion, collision avoidance, and reliable sensing.

IAM Robotics

www.iamrobotics.com
412-626-7425

IAM Robotics' team of world-class engineers developed Swift, the world's first commercially viable autonomous mobile manipulation robot.

Muratec

www.muratec-usa.com
800-428-8469

Muratec's Premex AGV vehicles can be customized to a variety of load sizes and transfer options to meet the needs of the application. Muratec's newer vehicle, the Premex XIO, can travel underneath equipment and transport loads between floors using elevators. It is also capable of integrating with ASRS, movable racks, and palletizing lines.

Oceaneering International

www.oceaneering.com/agv
713-329-4500
Oceaneering delivers

automated guided vehicle (AGV) turnkey solutions that support high vehicle numbers, diverse station types, varied logistics operations, and are adaptable to meet changing demands. Oceaneering AGV systems increase safety and efficiency, provide a reliable workforce, and enable manufacturers to leverage just-in-time delivery to meet production targets.



PINC

www.pinc.com
877-511-PINC

PINC's inventory robotics solution, PINC Air, collects and processes inventory information inside warehouses 100 times faster than humans can. To launch PINC Air is a simple three-click process through a cloud application. Once launched, the drone flies autonomously, captures inventory data, processes

the data onboard, and sends it to the cloud without any human interaction. Once the data is in the cloud, the application automatically compares the inventory scanned data with what's available in the warehouse management system, providing the user a final reconciliation report.

RightHand Robotics

www.righthandrobotics.com

RightHand Robotics builds a data-driven intelligent picking platform, providing flexible and scalable automation for predictable order fulfillment. RightPick, its autonomous piece-picking solution, handles the core task of picking and placing individual items as part of a wide range of warehouse workflows and processes. It works collaboratively with logistics facility employees and existing manual or automated systems.



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2020 TMS BUYER'S GUIDE

Supply chain disruptions created by the global pandemic, shifting capacity, fluctuating fuel costs, and demanding e-commerce customer requirements are raising shipper and carrier interest in transportation management systems (TMS).

A variety of solutions are available to meet every company's unique needs. From cloud-based, on-demand, web-hosted applications to traditional licensing installations, over the road, on the rail, containerized, or parcel, TMS vendors and service providers are expanding their offerings to target specific end-user requirements.

Because the choices can be overwhelming, *Inbound Logistics* offers this annual TMS Buyer's Guide of some leading providers and solutions that can put you on the right road toward improved transportation management and performance, regardless of the business conditions.

2020 TMS BUYER'S GUIDE

360data

www.360data.com
920-882-5222

PRODUCT: 360data TMS

PLATFORM: Hosted on the vendor's website, cloud-based

DESCRIPTION: Integrates with ERP systems or operates as a standalone. Full functionality without large capital investment.

3Gtms

www.3gtms.com
203-567-4610

PRODUCT: 3G-TM

PLATFORM: Hosted on the vendor's website, cloud-based

DESCRIPTION: Manages the full order-to-cash transportation cycle for 3PLs, brokers, freight forwarders, and shippers.

3rdwave/ Blinco Systems

www.3rdwave.co
416-510-8800

PRODUCT: 3rdwave iTMS

PLATFORM: Cloud-based

DESCRIPTION: Provides beneficial cargo owners with a completely integrated international TMS solution. Manages and controls freight contracts, track and trace, pier priority control, and drayage. Extensive reporting and analytics.

4flow

www.4flow.com

PRODUCT: 4flow vista

PLATFORM: Licensed to user (installed locally), cloud-based

DESCRIPTION: Integrates supply chain optimization and transportation management—from strategic design to tactical planning and daily execution, including claims.

DIGITAL VERSION:
bit.ly/TMS-2020

Acuitive Solutions

www.acuitivesolutions.com
704-847-4997

PRODUCT: Global TMS

PLATFORM: Cloud-based

DESCRIPTION: Targets the international ocean, dray, airfreight, and inbound small package execution needs of large and mid-sized shippers and retailers.

Agistix

www.agistix.com
650-362-2000

PRODUCT: Agistix

PLATFORM: Cloud-based

DESCRIPTION: Centralizes inbound, outbound, and third-party shipments across all carriers and modes.

Alpega

na.alpegagroup.com
877-763-3240

PRODUCT: Alpega TMS

PLATFORM: Cloud-based

DESCRIPTION: Connects carriers, customers, and suppliers via one platform to collaboratively manage end-to-end transportation workflows, from planning and optimization through freight settlement. Supports multimode, global networks.

AndSoft

www.andsoft.com
352 24 52 1-413

PRODUCT: e-TMS

PLATFORM: Licensed to user (installed locally), hosted on the vendor's website, cloud-based

DESCRIPTION: Encompasses the complete process of transporting goods, from order entry to transfer to accounting, including the planning, dispatching, execution tracking, invoicing, and reporting KPI phases.

AR Traffic

www.artraffic.com
212-736-8565

PRODUCT: CalcRate

PLATFORM: Licensed to user (installed locally), hosted on the vendor's website, cloud-based

DESCRIPTION: Allows users to see shipment costs before shipping, consolidate shipments, and perform advanced analytics to visualize and control their freight spend.

AscendTMS

www.thefreetms.com
813-681-5000

PRODUCT: AscendTMS

PLATFORM: Cloud-based

DESCRIPTION: Manages any logistics operation for freight shippers, brokers, and trucking companies from small single-person logistics operations to multi-billion-dollar international corporations. 100% free to use for the basic system, requires no downloads or installations, is mobile certified, and provides full enterprise-level TMS features.

Blue Yonder

www.blueyonder.com
833-532-4764

PRODUCT: Luminate Logistics

PLATFORM: Cloud-based

DESCRIPTION: Transforms transportation operations by managing both inbound and outbound, and integrating supplier and carrier collaboration tools.

BluJay Solutions

www.blujaysolutions.com
866-584-7280

PRODUCT: Transportation Management Software

PLATFORM: Licensed to user (installed locally), cloud-based

DESCRIPTION: Provides process automation and collaboration in a single workflow for freight moves across all modes.

2020 TMS BUYER'S GUIDE

Blume Global

www.blumeglobal.com
510-844-3000

PRODUCT: Blume Visibility

PLATFORM: Cloud-based

DESCRIPTION: Combines TMS features with a global trade management system and real-time tracking to provide end-to-end logistics data.

CargoSmart

www.cargosmart.ai
408-325-760

PRODUCT: CargoSmart
Transportation Management

PLATFORM: Hosted on the vendor's website, cloud-based

DESCRIPTION: Provides global shipment management solutions for collaboration, visibility, and predictive insights that leverage artificial intelligence and IoT to optimize supply chain planning and operations.

Carrier Logistics

www.carrierlogistics.com
914-332-0300

PRODUCT: FACTS: TMS

PLATFORM: Licensed to user (installed locally), hosted on the vendor's website, cloud-based

DESCRIPTION: Helps manage dispatching, freight bill entry, mobile communications, call logging, general ledger, and Internet tracing.

CDM Software Solutions

www.s-c-technology.com
972-469-3082

PRODUCT: CDM Web Freight

PLATFORM: Hosted on the vendor's website, cloud-based

DESCRIPTION: Includes agent data exchange, a drag-and-drop document manager, global shipment compliance, and customer tracking at the shipment and commodity level.

Cheetah Software Systems

www.cheetah.com
805-373-7111

PRODUCT: Cheetah LOOP

PLATFORM: Hosted on the vendor's website, cloud-based

DESCRIPTION: Allows users to build and dispatch optimized route plans. Plans around all variables and constraints, providing users with the ability to assess impact and analyze route alternatives.

ClearDestination

www.cleardestination.com
866-498-4491

PRODUCT: Delivery Management Solution

PLATFORM: Licensed to user (installed locally), cloud-based

DESCRIPTION: Features end-to-end delivery management solutions for manufacturers, retailers, and carriers.

ClearTrack

www.cleartrack.com
877-377-4400

PRODUCT: Clarity Shipment & Order Visibility

PLATFORM: Hosted on the vendor's website, cloud-based

DESCRIPTION: Allows manufacturers, brands, and retailers to track goods, orders, and shipments from origin to destination anywhere in the world with geomaps, dashboards, and business analytics.

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VERSION AT:
bit.ly/TMS-2020

Clearview Audit

www.clearviewaudit.com
855-737-3444

PRODUCT: TMS

PLATFORM: Cloud-based

DESCRIPTION: Provides real-time control over freight carriers in one portal, accessible online from all client-designated users.

Command Alkon

www.commandalkon.com
800-624-1872

PRODUCT: Haultt

PLATFORM: Licensed to user
(installed locally)

DESCRIPTION: Integrates logistics with sales to streamline quoting, dispatch, and billing for transportation management; matches needs to available trucks; and dispatches instructions to cab.

CT Logistics

www.ctlogistics.com
216-267-2000

PRODUCT: FreightRater

PLATFORM: Licensed to user (installed locally), hosted on the vendor's website, cloud-based

DESCRIPTION: Provides global freight quotes from multiple carriers in all modes, least-cost analysis, automated shipment execution, real-time status information reporting, and searching and data mining.

CTSI-Global

www.ctsi-global.com
888-836-5135

PRODUCT: TMS

PLATFORM: Hosted on the vendor's website, cloud-based

DESCRIPTION: Empowers U.S. and global shippers and 3PLs to plan and execute transportation and fully integrate with CTSI-Global's freight audit and payment, business intelligence, and managed services.

2020 TMS BUYER'S GUIDE

Descartes Systems Group

www.descartes.com
800-419-8495

PRODUCT: Descartes Transportation Management

PLATFORM: Licensed to user (installed locally), cloud-based

DESCRIPTION: Modular solution with standard and advanced functionality for transportation operations of any size. Leverages the Descartes Global Logistics Network to connect carriers and trading partners.

Echo Global Logistics

www.echo.com
800-354-7993

PRODUCT: EchoTMS

PLATFORM: Cloud-based

DESCRIPTION: Leverages AI, machine learning, and load-matching algorithms to create a flexible and effective system for shippers, carriers, and managed transportation clients.

Elemica

www.elemica.com
770-241-3950

PRODUCT: Elemica MOVE

PLATFORM: Cloud-based

DESCRIPTION: An inbound and outbound logistics automation suite of products. Users can connect to and collaborate with logistics service providers for logistics execution, visibility, site logistics, and freight cost management.

Fortigo

www.fortigo.com
512-372-8884

PRODUCT: TMS & Freight Audit Software

PLATFORM: Cloud-based

DESCRIPTION: Provides an on-demand TMS, freight audit, and vendor portal solution. Products are based on a carrier-neutral platform.

Freightgate

www.freightgate.net
714-799-2833

PRODUCT: Freightgate

PLATFORM: Cloud-based

DESCRIPTION: Offers supply chain collaboration and visibility, interactive online sailing schedules, multimodal and multifactor routing, quote management, regulatory compliance, and automated e-invoice audits.

Freightview

www.freightview.com
913-353-6188

PRODUCT: Freightview

PLATFORM: Hosted on the vendor's website, cloud-based

DESCRIPTION: Helps small and mid-sized businesses streamline quoting, booking, tracking, and reporting for LTL shipments. Supports multiple users and API access.

GlobalTranz

www.globaltranz.com
866-275-1407

PRODUCT: GTZconnect TMS

PLATFORM: Cloud-based

DESCRIPTION: Features an enterprise TMS for shippers, 3PLs, and carriers. Provides multimodal rating, routing, optimization, and visibility with asset/carrier management, predictive analytics, integration, and freight pay and audit.

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GTG Technology Group

www.gtgtechnologygroup.com
281-826-5750

PRODUCT: Intermodal Management System & Extensions

PLATFORM: Cloud-based

DESCRIPTION: 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
888-838-3868

PRODUCT: Haven TMS

PLATFORM: Cloud-based

DESCRIPTION: Provides singular shipping capabilities with one platform that includes booking, tracking, data analysis, and payment to allow global shipping teams to work more efficiently and reduce costs.

HighJump

www.mile.com
800-776-6706

PRODUCT: TMS Solutions

PLATFORM: Licensed to user (installed locally), hosted on the vendor's website, cloud-based

DESCRIPTION: Offers a single platform for transportation and logistics management for truckload carriers, freight brokers, and outsourced logistics providers.

Highway 905

www.highway905.com
908-874-4867

PRODUCT: Highway 905 Transportation Management System

PLATFORM: Cloud-based

DESCRIPTION: Allows shippers to optimize transportation costs with flexible freight rate management and audit, smarter carrier selection, and efficient load consolidations.

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Infor

www.infor.com
646-336-1700

PRODUCT: Network Transportation Management

PLATFORM: Cloud-based

DESCRIPTION: Control tower orchestration provides multimodal transportation visibility and synchronized, multiparty, multileg planning, in addition to freight procurement and optimized, automated execution.

Intellect Technologies

www.intellecttech.com
609-454-3170

PRODUCT: Intellect eFreight

PLATFORM: Licensed to user (installed locally), hosted on the vendor's website, cloud-based

DESCRIPTION: Manages shipping and logistics operations securely and profitably. Covers ocean, air, and ground modes, and can be implemented regionally or globally.

IntelliTrans

www.intellitrans.com
800-551-8815

PRODUCT: IntelliTrans TMS

PLATFORM: Hosted on the vendor's website, cloud-based

DESCRIPTION: Provides complete operational and analytical capabilities and visibility, and integrates with TransCore's fixed and handheld readers.

LeanCor Supply Chain Group

www.leanco.com
859-283-9933

PRODUCT: TMS

PLATFORM: Cloud-based

DESCRIPTION: Connects into any material requirements planning system through API connections to give planners, receiving teams, shipping teams, and customers real-time visibility.

Logility

www.logility.com
800-762-5207

PRODUCT: Logility Voyager Solutions

PLATFORM: Licensed to user (installed locally), cloud-based

DESCRIPTION: Automates multimodal 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
571-426-5951

PRODUCT: Logix

PLATFORM: Licensed to user (installed locally)

DESCRIPTION: Incorporates robust transportation planning and distribution network optimization for freight management routing and scheduling, LTL shipment consolidation, load optimization, mode selection, backhaul optimization, and driver/vehicle scheduling.

Logistyx Technologies

www.logistyx.com
847-884-1940

PRODUCT: Logistyx TME

PLATFORM: Licensed to user (installed locally), cloud-based

DESCRIPTION: Combines advanced business intelligence and a global network of more than 8,500 carrier services to enable on-time delivery and increase revenue per shipment.

Made4net

www.made4net.com
800-M4N-1041

PRODUCT: SCExpert Platform

PLATFORM: Licensed to user (installed locally), cloud-based

DESCRIPTION: Includes a suite of integrated warehousing and transportation modules that can be individually deployed, modified, or combined as needed based on business requirements.

Manhattan Associates

www.manh.com
770-955-7070

PRODUCT: TMS

PLATFORM: Cloud-based

DESCRIPTION: Improves carrier collaboration and connectivity, delivering network-wide visibility to enable strategic and operational planning, execution, and real-time route adjustments to improve efficiencies.

MercuryGate

www.mercurygate.com
919-469-8057

PRODUCT: TMS

PLATFORM: Licensed to user (installed locally), hosted on the vendor's website, cloud-based

DESCRIPTION: Manages all stages of the transportation life cycle—planning, selling, execution, and settlement.

Navigate

www.navigate.com
800-944-2471

PRODUCT: Navigate

PLATFORM: Cloud-based

DESCRIPTION: Includes a software platform for supply chain, logistics, customs, transportation, and vendor management. Provides API and full customer integration and customization.

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Next Generation Logistics

www.nextgeneration.com
847-963-0007

PRODUCT: Dynamics TMS

PLATFORM: Licensed to user (installed locally), hosted on the vendor's website, cloud-based

DESCRIPTION: Enables effective and efficient transportation decisions through a complete enterprise transportation management planning and execution suite.

Nulogx

www.nulogx.com
905-486-1162

PRODUCT: TMSO

PLATFORM: Licensed to user (installed locally), hosted on the vendor's website, cloud-based

DESCRIPTION: Supports all the activities necessary to manage and execute the full life cycle of the transportation process.

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One Network Enterprises

www.onenetwork.com
866-302-1936

PRODUCT: Intelligent Logistics

PLATFORM: Hosted on the vendor's website, cloud-based

DESCRIPTION: Covers the full life cycle of transportation processes, including procurement, contracting, shipment planning, execution and tracking, yard management, appointment scheduling, and financial/claims settlement.

Optimize Worldwide Transportation Solutions

www.meadowlarkcompanies.com
406-237-0852

PRODUCT: OPTIMIZE

PLATFORM: Cloud-based

DESCRIPTION: Provides an end-to-end solution for domestic and international logistics. Analyzes the supply chain for savings, boosts efficiency, and cuts waste to optimize each shipment.

Optym

www.axele.com
833-462-9353

PRODUCT: Axele

PLATFORM: Cloud-based

DESCRIPTION: Optimizes truckload operations with a software platform that eases decision-making about trip plans and load selection, plus a mobile app that streamlines communication.

Oracle

www.oracle.com
800-633-0738

PRODUCT: Transportation Management Cloud

PLATFORM: Cloud-based

DESCRIPTION: Manages all transportation activity throughout global supply chains. Supports shippers and 3PLs, and applies to basic transportation needs and/or highly complex logistics requirements.

Paragon Software Systems

www.paragontruckrouting.com
972-731-4308

PRODUCT: Routing and Scheduling Software

PLATFORM: Licensed to user (installed locally)

DESCRIPTION: Improves the efficiency of route planning by maximizing the use of all drivers and vehicles, reducing fuel costs, and improving the accuracy of ETAs.

Pierbridge

www.pierbridge.com
508-630-1220

PRODUCT: Transtream Multicarrier Management Solution

PLATFORM: Cloud-based

DESCRIPTION: One platform automates rating, shipping, and tracking for all major parcel, LTL, and local carriers in warehouse, store, shopping cart, and office environments.

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nVision Global

www.nvisionglobal.com
770-474-4122

PRODUCT: iImpact TMS

PLATFORM: Cloud-based

DESCRIPTION: iImpact TMS provides the visibility and management of global shipments from creation through delivery. Users can integrate all the must-have features of a TMS solution with nVision Global's other technologies, such as freight audit and payment, freight claims, and business analytics. nVision Global is one of the few providers that can offer these solutions in a single package and still offer a configurable TMS solution that meets your exact needs and specifications.

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Port TMS

www.porttms.com
877-767-8867

PRODUCT: Port TMS

PLATFORM: Cloud-based

DESCRIPTION: Improves automation of carrier management and document transactions, streamlines workflow with visibility, and eliminates mistakes with digital double-check.

Princeton TMX

www.princetontmx.com
800-435-4691

PRODUCT: Transportation Management Software

PLATFORM: Hosted on the vendor's website, cloud-based

DESCRIPTION: Provides tools to improve efficiency, freight spend, load-planning execution, and settlement, as well as optimize carrier selection.

ProShip

www.proshipinc.com
800-353-7774

PRODUCT: Transtream Parcel TMS

PLATFORM: Licensed to user (installed locally), cloud-based

DESCRIPTION: Handles shipping automation, advanced rating, tracking, and business rule processing to reduce costs per shipment at increased scale of performance.

QAD Precision

www.precisionsoftware.com
312-239-1630

PRODUCT: International Shipment Execution and Global Trade Management

PLATFORM: Licensed to user (installed locally), hosted on the vendor's website, cloud-based

DESCRIPTION: Streamlines shipment execution, automates business processes, and handles freight payments. Allows users to rate, route, produce labels, and manage service levels for any shipment mode.

Quad Express

www.shipquadexpress.com
323-336-6700

PRODUCT: Silver Express

PLATFORM: Hosted on the vendor's website

DESCRIPTION: Provides web-based access to domestic LTL, PTL, truckload, intermodal, domestic and international air and ocean rates, EDI booking, shipment tracking, custom reports, and more.

Ramco Logistics Software

www.ramco.com
609-620-4800

PRODUCT: Logistics ERP

PLATFORM: Licensed to user (installed locally), cloud-based

DESCRIPTION: Works across a multimodal transport network and manages all key processes covering shipment order management, planning, execution, documentation, and billing.

RateLinx

www.ratelinx.com
262-565-6150

PRODUCT: ShipLinx

PLATFORM: Cloud-based

DESCRIPTION: Allows optimization, reporting, and visibility across all carriers and modes with advanced rate modeling, business rules, a freight marketplace, and small-parcel compliance.

Revenova

www.revenova.com
312-319-5413

PRODUCT: RevenovaTMS

PLATFORM: Cloud-based

DESCRIPTION: A CRM-powered multimodal TMS all the way through to accounting, built entirely on the Salesforce.com platform. Fully integrated customer and carrier portals.

SaaS Transportation

web.saastransportation.com
844-722-7763

PRODUCT: e-Transportation TMS Software

PLATFORM: Hosted on the vendor's website, cloud-based

DESCRIPTION: Features a TMS developed around API and EDI, allowing for easy connectivity to hundreds of carriers.

SAP

www.sap.com
800-872-1727

PRODUCT: SAP Transportation Management

PLATFORM: Hosted on the vendor's website, cloud-based

DESCRIPTION: Enables users to manage all inbound and outbound domestic and international freight in the same environment, and provides traceability and visibility of orders, shipments, items, and logistics processes.

ShippersEdge TMS

www.shippersedgetms.com
952-777-4421

PRODUCT: Transportation Management System

PLATFORM: Cloud-based

DESCRIPTION: Provides an affordable and capable solution for small to mid-sized businesses.

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- streamlined audit & payment functions
- parcel manifesting with weigh-in-motion
- allocation of freight charges down to the SKU level
- tracking and tracing

www.artraffic.com

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Tecsys

www.tecsys.com
800-922-8649

PRODUCT: TMS

PLATFORM: Licensed to user (installed locally), cloud-based

DESCRIPTION: Features transportation planning and execution software suitable to common carrier shipments or proprietary courier fleets.

TMC (a division of C.H. Robinson)

www.mytmc.com
866-331-2435

PRODUCT: Navisphere

PLATFORM: Cloud-based

DESCRIPTION: A single-instance technology platform that serves all modes and regions. Provides global visibility, mode/route optimization, shipment tender, freight payment, language/currency capabilities, and business intelligence.

Transporeon

www.transporeon.com
267-281-1555

PRODUCT: Transporeon

PLATFORM: Cloud-based

DESCRIPTION: Offers a global collaborative platform for supply chain communication. Allows shipments to be automatically based on predefined guidelines or based on spot market assignment.

Transportation Insight

www.transportationinsight.com
828-485-5000

PRODUCT: Insight TMS

PLATFORM: Cloud-based

DESCRIPTION: Blended proprietary and commercial platform offers order, mode, route, and carrier optimization; shipment rating, execution, and tracking; and process automation.

TransportGistics

www.transportgistics.com
631-567-4100

PRODUCT: TGI:TMS

PLATFORM: Licensed to user (installed locally), hosted on the vendor's website, cloud-based

DESCRIPTION: Provides simple, incremental solutions to improve, monitor, and enforce compliance among partners. Reduces, uncovers, and avoids excessive costs through planning, execution, and analytics.

TransTelligence

www.transtelligence.com
513-770-1102

PRODUCT: ViaTMS

PLATFORM: Cloud-based

DESCRIPTION: Provides customized systems, system integration, and strategic consulting for 3PLs.

Trimble Transportation

www.transportation.trimble.com
866-920-5174

PRODUCT: TMW.Suite, TruckMate, Access

PLATFORM: Licensed to user (installed locally), hosted on the vendor's website, cloud-based

DESCRIPTION: Provides real-time visibility and control of every operational area and process.

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UltraShipTMS

www.ultrashiptms.com
800-731-7512

PRODUCT: UltraShipTMS

PLATFORM: Cloud-based

DESCRIPTION: Features a single-source solution for transportation and private fleet management, optimization, scheduling, and settlement for high-volume shippers in food production, packaging, manufacturing, retail, and other industries.

UROUTE

www.uroute.net

PRODUCT: UROUTE

PLATFORM: Cloud-based

DESCRIPTION: Features procurement, visibility, bill audit, dynamic reports, multifacility scalability, and carrier-driver management functions.

Web Integrated Network

www.gowithwin.com
855-946-4739

PRODUCT: Web Integrated Network (WIN)

PLATFORM: Cloud-based

DESCRIPTION: A cost-effective, web-based transportation management system that puts users in total control of their North American shipping operations.

Zero Down

www.zdscs.com
800-785-7959

PRODUCT: TMS

PLATFORM: Cloud-based

DESCRIPTION: Features parcel and freight transportation management systems that allow users to obtain quotes from carriers and initiate and track shipments with one login.



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COVID-19

SUPPLY CHAIN RESOURCES & RECOVERY STRATEGIES

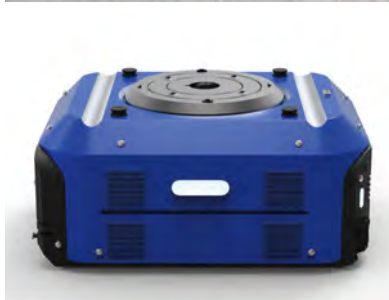
3 INNOVATIONS ON THE FAST TRACK

1. Delivery drones. Their deployment has been fast tracked to reduce the risk of exposure for drivers and bolster capacity to meet soaring demand for home deliveries. For example, UPS and CVS plan to use drones to deliver prescription medications to a Florida retirement community. Alphabet's drone delivery company, Wing, has also seen a strong increase in demand for drone deliveries, with volumes more than doubling at its test locations in the United States and Australia.

2. Autonomous vehicles. In April 2020, the Mayo Clinic announced it would use self-driving shuttles to move COVID-19 tests from a testing site to a processing lab in Florida to speed delivery and limit potential exposure.

3. Robotics solutions. Retailers are increasingly adopting technology to combat supply chain disruptions caused by the pandemic. In its latest earnings report, Target notes accelerated investments in robotic solutions to rapidly replenish in-demand products and monitor pricing on the sales floor. Grocers Albertsons and Stop & Shop are testing the use of robotics to process customer orders at their warehouses.

—Gaurang Shastri, Managing Director,
Lincoln International



"FOR RETAILERS, AN OPTION WORTH CONSIDERING IS TO SHIFT SLOWER-MOVING INVENTORY INTO A REVERSE-TO-FORWARD DISTRIBUTION MODEL, OR EVEN A REVERSE-TO-E-COMMERCE FLOW, KEEPING SALEABLE RETURNS AND OVERSTOCKS IN COMMERCE WITH A CHANCE TO SELL AT FULL PRICE."

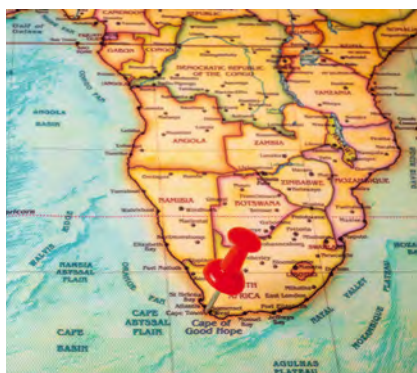
—Rob Zomok, President,
Global Operations,
Inmar Intelligence

"COMPANIES SHOULD TRY TO HAVE AT LEAST ONE DOMESTIC OPTION FOR PRODUCTION TO MITIGATE THE RISK OF A SHUTDOWN IN GLOBAL SHIPPING OR COUNTRY-LEVEL PRODUCTION."

—Jane Mosbacher Morris,
CEO and Founder,
To The Market

“SUPPLY CHAINS HAVE LARGELY BEEN RUN ON THE BASIS OF MINIMIZING COST PER PIECE. AFTER THE COVID-19 DISRUPTION, MANUFACTURERS AND RETAILERS WILL LOOK MORE TOWARD THE BEST PLACES TO SOURCE, BUILD, AND STORE THEIR GOODS AND NOT SIMPLY THE CHEAPEST PLACES. THIS WILL BE A MORE HOLISTIC VIEW.”

*—Ron Leibman,
Head, Transportation,
Logistics &
Supply Chain
Management Practice,
McCart & English*



CONTAINER LINES MAP OUT SOLUTIONS

While supply clearly outstrips demand, ocean carriers have been working hard to make adjustments to protect rates, aggressively withdrawing capacity from the market and adopting more creative strategies.

For example, on the Far East-Europe trade, some owners now send ships around the Cape of Good Hope rather than utilizing the Suez Canal. This takes longer, temporarily removing capacity, while also saving on Suez transit rates. As such, contracted rates are generally holding strong—with spot rates, despite a bleak outlook, also proving resilient for the time being.

—Patrik Berglund, CEO & Co-Founder, Xeneta

THE PRICE IS RIGHT

We are in the middle of an e-commerce boom, which could expose dangerous issues with pricing inconsistency across products, locations, and channels. That includes in-store, online, phone orders/direct sales, and third parties such as Amazon.

A majority of U.S. consumers have shopped for groceries online recently because of the COVID-19 pandemic, reports a recent survey by Fabric, a fulfillment company. Respondents say they'll keep up more than 50% of their online shopping even after life returns to a new normal where they can venture out of their homes.

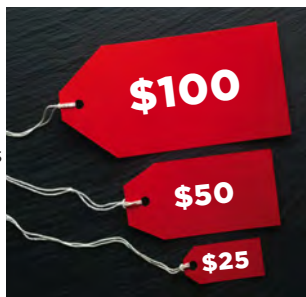
More online sales in the “next normal” means distributors and retailers will have to figure out how to measure price sensitivity and the impact of price changes on demand.

Online sales are more price sensitive, so that's tricky. Establishing pricing consistency will require deep and wide analysis of price sensitivity and customer willingness to pay across all products. Unless you have a team of 1,000 data scientists at the ready, you'll want to implement price optimization software.

Price optimization software allows you to quickly and accurately uncover valuable information across all products to maximize profitability as opposed to operating on a cost-plus basis.

For example, why is your higher-quality pipe fitting or oil filter priced lower than your lower-quality one? In a cost-plus pricing scenario where you are selling more of the higher-quality product, you may get a lower cost and end up with a lower price. That inconsistency will be both obvious and damaging online. A price optimization solution does the heavy lifting to identify “good-better-best” price tiering to optimize prices for profitability and make them consistent.

*—Cliff Isaacson, Executive Vice President, Product Strategy,
Blue Ridge*



5 WAYS TO MANUFACTURE GOODS OUTSIDE YOUR CORE EXPERTISE

Quickly ramping up manufacturing can be a delicate task with existing product lines. For completely new product lines, that task becomes daunting at best. Here are some techniques for success:

1 Collaborate in a safe place.

Executive committees for various supply chain conferences have formed COVID-19 task forces to discuss challenges and solicit assistance from experts at other member companies.

2 Extend relationships. For example, JD Logistics, one of the largest logistics providers within China's Wuhan province, is partnering globally with a supplier to provide that supplier's other customers with extensive on-the-ground expertise and infrastructure to make sure that critical shipments happen as quickly as possible.

3 Harness core competencies.

Closed factories are deploying their vast engineering talents to quickly retool lines and develop processes to ensure that critical goods are manufactured and flowing to the market.

4 Deploy manufacturing shifts.

Organizations are dividing their workforces into groups of shift workers that can swap in and out for one another. If one person in any given shift becomes ill, then that entire team can be quarantined and swapped out with another team.

5 Develop data science war rooms.

SWAT teams consisting of data engineers, data scientists, and supply chain modeling experts are rapidly setting up applications to help organizations harness artificial intelligence to drive decisions on how to effectively utilize manufacturing capacity for alternative products.

*—Matt Tichon,
Vice President of Industry
Strategy, LLamasoft*



GROCERY SUPPLY CHAIN SHOPS FOR SOLUTIONS

Grocery retailers have been working diligently to keep supply lines coming into stores, and best practices in sourcing and distribution are emerging among retail grocery stores coping with disruptions to normal supply lines.

Under normal circumstances, grocery retailers source from vetted manufacturers and large wholesalers. Additionally, some retailers work with contract manufacturers to create white-label products, and others produce products in their own manufacturing facilities.

COVID-19 has brought forth some problems with the current system, particularly around sourcing and distribution.

Long-term collaborative relationships with manufacturers have made it harder for retailers to quickly switch suppliers. Rigidity in sourcing means that when large consumer packaged goods (CPG) companies cannot scale production as quickly as is required, retailers are unable to quickly turn on an alternate source.

SWITCHING LANES

The problem is compounded by the chasm between the supply channels for food distributed to grocery stores and food distributed to restaurants, hospitals, schools, and hotels, and the near inability to switch flows from one channel to another. Suppliers who generally sell into food service have found it challenging to change their packaging to distribute it through grocery retail.

Efficiency-based distribution arrangements between large CPG manufacturers and grocery retailers create another layer of rigidity in the system. Large CPG manufacturers that provide a wide assortment of items to grocery retailers typically supply retail store-specific pallets to cross docks or distribution centers from which stock is delivered to specific retail stores. In some cases they deliver product directly to the store shelf, thus saving the retailer the cost of having to stock the item.

This model is extremely efficient for the retailer, but it limits the degrees of freedom in stock reallocation when supply is scarce and store-level demand has changed between the time the replenishment orders were created and actual delivery from the supplier.

While demand planning/tracking systems are able to identify demand surges, the tight coupling of flows with the selected

manufacturers limits the ability of a grocery retailer to respond and react to such surges quickly by sourcing from additional manufacturers or reallocating stock to other stores. To help alleviate this challenge, retailers can implement the following best practices:

- **Sourcing flexibility.** While deep relationships and extensive collaboration with manufacturers will still remain the cornerstone of retail supply chain management, having the flexibility to source from multiple suppliers, including food service providers in conjunction with copackers, on short notice, will regain importance.

New data integration technologies have made it easier and quicker to share demand projections and other forms of collaborative information with new suppliers. As a result, bringing new suppliers on board is easier both operationally and tactically if the overall strategy to guide this exists.

Sourcing and procurement teams should frequently revisit the triggers of when sourcing would switch on an additional source, and define what level of demand surge or supply shortfall would trigger this. Digital solutions and advanced analytics that dynamically readjust such triggers will gain popularity.

- **Pick to zero and quick stock reallocation capabilities.**

The trade-off between efficiency at the distribution center and flexibility will shift post-COVID-19 and more stock allocation decisions will be made at the distribution center level.

Distribution centers can also be used as a repacking station, perhaps taking certain products that were diverted from food service and repacking them for retail. Metrics should shift from cost per case shipped to include the additional workload at the distribution centers.

Grocery retail supply chain professionals who are able to make these strategic shifts will not only be better equipped to meet crises like COVID-19, but even during normal circumstances will be better at providing their customers an assortment of products from a multitude of suppliers, which meets customers' dynamic and shifting preferences.

—Prashant Yadav
AFFILIATE PROFESSOR OF TECHNOLOGY & OPERATIONS MANAGEMENT, INSEAD;
SENIOR FELLOW, CENTER FOR GLOBAL DEVELOPMENT

—Kirsten Curtis
BOARD MEMBER, PUREPLUS, A CPG COMPANY

EXPEDITING THE INEVITABLE

Post-COVID-19, it's critical that companies go back to the basics and shore up gaps in their IT and operations. For some, it will be more incremental changes; for others, it might be a total system overhaul. And for others it will mean leveraging their current systems to enable more efficient data analysis. In many ways, the COVID-19 crisis has expedited the inevitable—changes that were coming, but are now even more essential to strengthen the supply chain for the future.



DEVICE MODERNIZATION

Mobile technology is the lifeblood of operations, and companies that continue to hold on to legacy Windows Mobile-based hardware will find themselves quickly outpaced.

This is the time to trade up to Android. While it seems a bit counterintuitive, moving to new hardware will lower the total cost of ownership and create more flexibility as the supply chain continues to change at a rapid pace. Look for as-a-service options to help prioritize cash flow while continuing to innovate.

Companies need a way to effectively—and remotely—troubleshoot mobile device issues for their teams at the warehouse or in the field. New devices give more flexibility and allow for video learning and remote access. Companies can also outsource the management function of mobile devices to a supply chain partner, which frees up internal IT to focus on top-priority projects.

Companies that have already modernized devices can use this time to focus on data—improving the types of data capture and how to use that data toward continuous improvement initiatives.

—Shane Snyder, President,
Barcode, Inc.



SCENARIO PLANNING AND DEMAND SENSING

For life science industries, the current crisis demonstrates how crucial capabilities such as scenario planning are, since customers need and depend on their medications to be delivered on time. Even if one source shuts down, the supply chain will need to be resilient enough to efficiently pivot to respond.

Since the start of the pandemic, scenario-planning usage has spiked dramatically in the life sciences industry because these companies need to model responses quickly and often. Demand sensing will also be elevated, as companies will need to more closely monitor what true demand looks like.

Moving forward, companies across all industries will need to show the inner workings of their supply chain several tiers deep to ensure true visibility.

Life sciences organizations in particular will need to provide global visibility across all tiers so they can predict and respond to imminent or forecasted shortages of life-saving or life-sustaining medical treatments, vaccines, and equipment.

—Bill DuBois, Director,
Industry Marketing, Kinaxis



COLLABORATIVE FREIGHT TECHNOLOGY

The COVID-19 pandemic has revealed the importance of partnering with logistics providers that invest in cloud-based collaborative transportation management systems as well as automated tools to ensure each shipment is efficiently and effectively handled every time.

For example, does the logistics provider have an AI algorithm to identify that the truck driver is falling behind schedule without human intervention? Such an algorithm will automatically notify the appropriate users to help them take immediate action to avoid missing on-time delivery.

Using this example, shippers should also ask how the algorithm triggers this event. How is the truck plugged into the TMS? Is the driver plugged in via mobile application, electronic logging device, text message tracking, or an Internet of Things device tracker placed in the trailer? Are you sure the integration is robust enough? Can you demonstrate on a case-by-case scenario?

Achieving excellent supply chain management requires using AI-based systems and people working together, where the outcome will be greater than when each executes on its own.

—Nick Damanchev, CEO,
Archerhub

SUPPLY CHAIN PIVOTS

Working with suppliers to procure parts, such as elastic straps and third parties to streamline design, manufacturers are refashioning production lines once dedicated to churning out automobiles, zippers, and perfumes to produce face masks and ventilators. Addressing the need for personal protective equipment, makers of everything from jewelry to plastic film to plane interior components are repositioning production capacity.

Logistics service providers are staying in lockstep with these about-faces, completing expedited deliveries and rerouting shipments to the hardest-hit areas. Here are just a few examples:



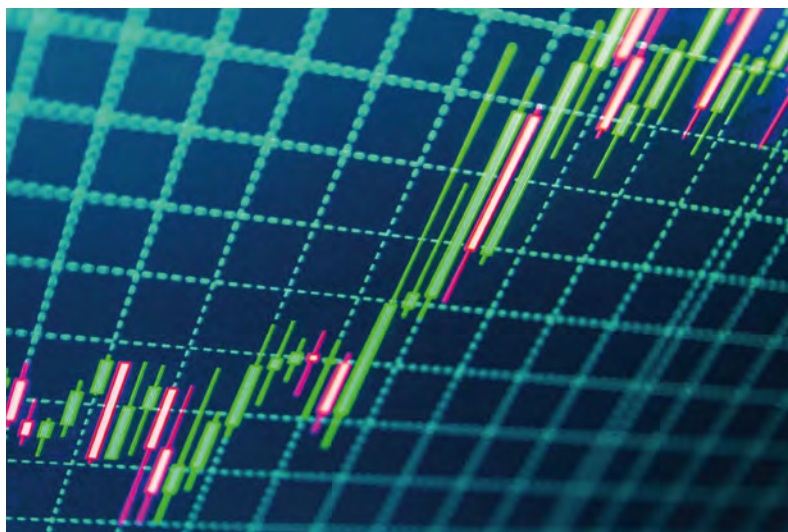
- Forklift truck maker Raymond utilized its facility in Greene, New York, to 3D print and assemble face shields. It made more than 2,000 face protectors for local hospitals and emergency responders.



- Lufthansa converted its Airbus A350 passenger aircraft to transport protective equipment from China to Munich Airport in Germany, operating two daily flights in April and May 2020.



- Organic vape juice producer Kai's Organics repurposed a portion of its production facility to make certified organic hospital-strength hand sanitizer. Logistics provider Capacity LLC transported the products from the e-liquid producer's California facility to New York.



DIGGING DEEP WITH DATA

Within a single product line, you may see demand for certain SKUs quickly spike up, while others decline steeply. This pattern can vary by channel, segment, and region during the COVID-19 crisis.

To help companies with production and transportation planning, supply chain forecasting and analytics techniques should address the following:

1 Forecasting models based on pre-crisis conditions are no longer relevant or reliable. Companies can't rely on the well-established techniques that suit them well in a steady-state environment. It is key to be able to discover new predictive patterns within the latest data refreshes, train useful models, and get models into use quickly.

A platform that can evaluate millions of factors in minutes can help data scientists build useful forecast models quickly, based on learnings from early impacted areas. Additionally, it can enable data scientists to quickly incorporate and discover useful predictive signals in external datasets, such as maps and demographics.

2 Typical reporting and business intelligence methods are revealing their blind spots. They provide an aggregated view of the business, which overlooks much of the underlying insights that are visible

only when one, two, or three levels of additional factors are considered.

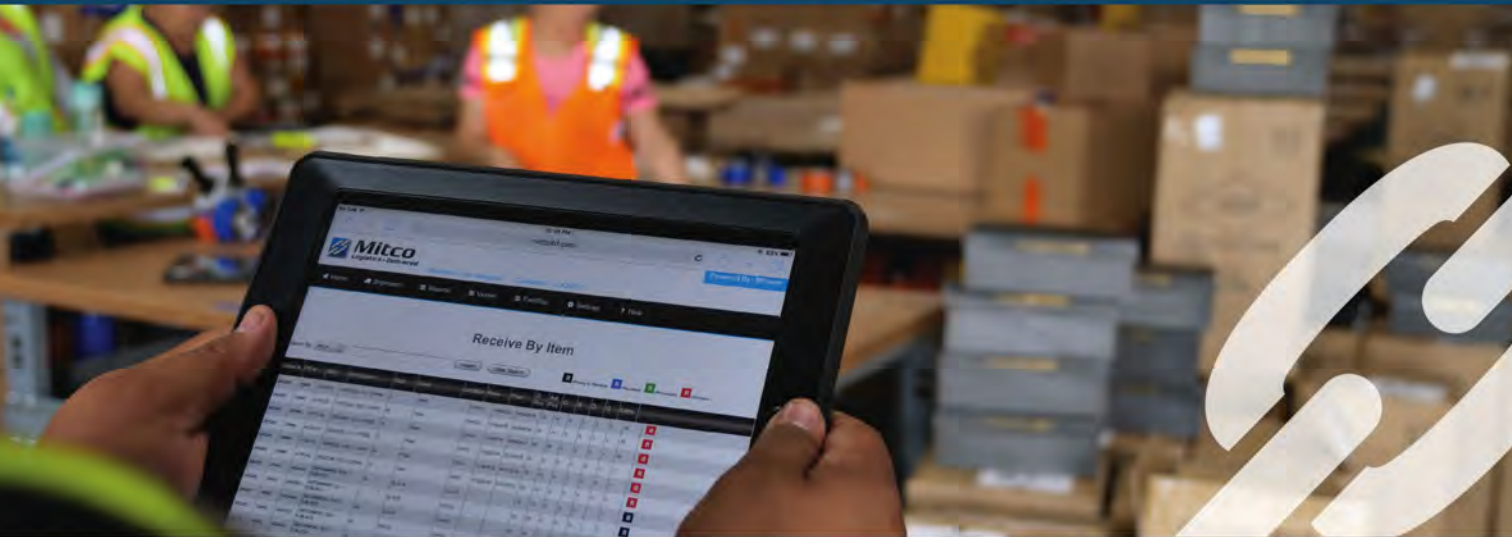
Take the example of a B2B distribution company: In a recent month, within a particular customer segment and region, demand for some SKUs increased dramatically while other SKUs plummeted. Standard reports showed no change in demand on aggregate, overshadowing the extreme SKU-level volatility in that segment and region.

The company missed this early alert, catching it only in the next cycle of reporting once it had become a major issue, and was weeks behind in making supply chain changes upstream.

Given the speed with which opportunities and threats are emerging, the ability to rapidly and exhaustively detect emerging trends is key. An AI-powered solution provides this level of exhaustive, multidimensional, and dynamic trend detection that cuts through the blind spots and noise of traditional reporting and provides timely and actionable intelligence, in near real time, to supply chain decision-makers.

Now more than ever, supply chains must react quickly and nimbly. Having the right insights at the right time, and refreshed, relevant forecasts, are key to getting their actions right.

—Mike Sterling, Director of Impact Management in the Americas, SparkBeyond



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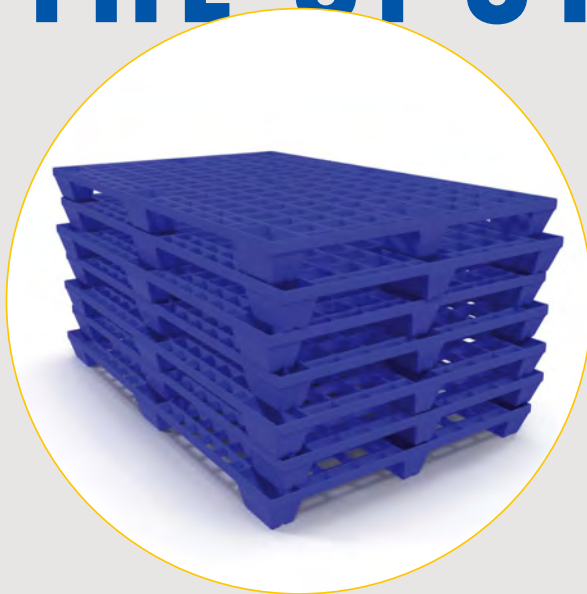
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CONSIDERED A CRUCIAL PART OF A SYSTEMS APPROACH TO THE SUPPLY CHAIN, PALLETS ARE FRONT AND CENTER IN COMPANIES' SUSTAINABILITY STRATEGIES.

PALLETS TAKE THE SPOTLIGHT



Before the advent of warehouse club stores, pallets were usually found behind the scenes. Today they're front and center in retail spaces, stacked with products and serving as merchandising fixtures.

Companies have to consider pallets as an important component in a systems approach to the supply chain. They're also a crucial part of many companies' sustainability strategies based on the

recyclability of materials and the use of the assets.

With more than 2 billion in circulation in the United States alone, pallets are no longer the hidden backbone of the supply chain. About 93% of all goods are shipped on pallets. There's an awareness of pallets from the point of production to consumption and return. They're seen as integral components of the supply chain that can be a competitive advantage or a high-cost hindrance if not managed properly.

Because pallets are ubiquitous, and there aren't alternatives in most cases, supply chain managers work to be as efficient as possible when it comes to selecting and managing their pallet portfolio.

While consumers have high expectations for service levels, they're also looking for brands and retailers that genuinely consider the environment in their operations.

Managing pallets sustainably helps companies meet consumer

expectations while reducing their environmental impact.

The increasing emphasis on a circular economy compared to a linear approach applies to pallets in two areas: operational efficiency and life cycle, which reflects the pallet's fate at the end of its useful life.

In a circular supply chain, pallets are loaded, sent to a destination, unloaded, and then returned to the point of loading for the next trip and reused as often and quickly as possible. At the end of their life cycle, pallets are repaired or recycled for another round of reuse. Using pallets in this manner generates tremendous economic and environmental benefits.

Companies are examining their pallet strategy to understand how it fits into overall operations to achieve greater efficiencies and lower costs. Pallet pools offer rented or leased pallets that move in a circular supply chain. Pallets move in a flow from production centers in



Plastic pallets from CABKA seamlessly fit into transport systems configured for wooden pallets. The lightweight plastic pallets deter product damage and reduce breakage rates.

MANAGING PALLET SUSTAINABLY HELPS COMPANIES MEET CONSUMER EXPECTATIONS.



the center of the country out to the coasts, and back again for reloading.



Repositioning pallet assets helps reduce the number of empty truck miles driven each year. Carriers appreciate having the backhaul to utilize their assets instead of deadheading.



Pallet pool operators can track pallets at the granular level to show users how much solid waste and carbon dioxide were saved in the circular economy.

By contrast, a linear life cycle results in the disposal of the asset at the end of its useful life. The linear approach is wasteful and inefficient both operationally and environmentally.

In some cases, pallets can flow only one way and are not part of a pool or circular operation. But even in these cases, the pallets can be repurposed once their initial journey is completed.

The materials that comprise the pallet also figure into the circular economy. Currently, the biggest battle is between wood and plastic, with other materials,

such as steel, making up a small portion of the market. However, pallets can also be made of different materials such as corrugated board and metal. They can be manufactured using both virgin and recycled materials.

SUSTAINABLY GROWN

Wood pallet makers tout the use of sustainably grown wood as a material that can be recycled or repurposed at the end of its life. Many pallet makers source new lumber from forests certified by the Forest Stewardship Council (FSC) or Sustainable Forest Initiative (SFI).

These certifications mean the trees are harvested at a rate lower than that of the new trees being produced. These forests are sustainable and are responsibly managed to provide environmental, social, and economic benefits.

Pallets of any material can be designed from the start to be repaired and recycled, which streamlines their life cycle and environmental impact. Wood pallets can be repaired and repainted if they're damaged, reducing the use

of new materials to keep the asset in working order. Heavy-duty wood block pallets can last up to 10 years if they are regularly maintained.

Industry research finds 95% of wooden pallets are recycled or recovered into usable materials. Wood pallets that no longer meet specs can be sold to the secondary market for repair. Or, they find other uses such as being ground up for mulch or biofuels.

RECYCLABILITY FACTOR

Plastic pallets, in many cases, are made from recycled materials or can be recycled at the end of their life cycle.

Plastic pallets can last up to 15 years without repair in some supply chains. At the end of its life, the pallet can be ground up, and the plastic reused for a new pallet or another product. Metal pallets can be recycled as well.

In the circular economy, sustainability is the core of the business model. Pallets designed and built for a long life cycle last and can be repaired more easily than products produced for a linear economy.

CABKA introducing one solution to many applications: The NestRack



Recycled



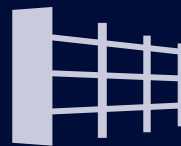
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Pallets built with sustainability in mind are also higher-quality units. They are more likely to be dimensionally consistent with standard sizes that align with materials handling equipment. With greater use of warehouse automation, out-of-spec pallets could cause significant material flow problems. Stable dimensions also reduce breakage

“At CABKA, recycling is a passion, not just in the use of the recycled plastics, but also in offering closed-loop solutions for our customers, so that they can actively participate in offering more sustainable solutions in their supply chain,” Russell says.

The company was an innovator as one of the first to use recycled plastic

and sanitize when necessary, and meet health and safety requirements for food and pharmaceutical uses. CABKA offers a line of hygienic plastic pallets with closed surfaces that keeps dirt from accumulating and makes cleaning fast and easy, Russell notes.



PLASTIC PALLETS ARE VALUED FOR THEIR HYGIENE. THEY ARE EASY TO CLEAN AND SANITIZE.

and resulting damage to the product that could be onboard.

INNOVATION IN PLASTIC PALLETS

Some companies are making the switch to plastic pallets to achieve sustainability goals as well as operational improvements.

For example, a national discount retailer switched to CABKA plastic pallets for internal use to reduce product damage and store-floor damage, says Steve Russell, CABKA’s vice president of sales and marketing.

CABKA is the largest plastic pallet producer in the world in terms of revenue and the second largest in terms of volume, with around 10 million pallets produced and sold per year. The company recycles 70% of materials in-house in the vertically integrated process from recycling to the final product.

to manufacture new products and was a pioneer in processing mixed plastics, which are usually difficult to recycle.

The CABKA process uses materials from industrial production scraps, packaging waste from private households, and worn-out plastic products. The company recycles and reshapes plastic waste into a diverse line of products, including export pallets, reusable pallets, pallet boxes, containers, and custom-made products. Overall, the company uses 23,000 tons of recycled plastic for its EcoProducts each year. Each ton of recycled plastic saves about 1.26 tons of carbon dioxide.

Companies can use their own scrap to make pallets. “For example, one coffee company sends plastic scraps to be recycled into pallets for use in their own warehouse,” Russell says.

Plastic pallets are also valued for their hygiene. They are easier to clean

DPB, a Dutch beverage manufacturers’ shared pallet pool, began replacing all its wooden pallets with plastic pallets in 2012. The pool had 800,000 wooden pallets in circulation. Operational costs were high from dirty chips and injury-prone splinters, heavy weight—particularly when wet—and disposing of damaged or soiled pallets.

The group adopted the BPP i9 from CABKA, a customized plastic pallet that seamlessly fit into existing storage and transport systems, which were configured for handling the wooden pallets. The forklift pockets, deck height, and blocks of the BPP i9 were the same dimensions as its wooden predecessor.

The plastic pallets were more than 30% lighter than the wood versions. The annual breakage rate fell from 25% to less than 6%. Overall, the pool participants experienced a reduced rental fee as well as a much lower rate of product damage.

The latest CABKA innovation is the NestRack, a nestable plastic pallet that is also suitable for high rack storage. While it has a net weight of only 22 lbs., it can carry up to 2,700 lbs. in racking, which is a revolutionary weight-to-load ratio. The runners ensure smooth transport on roller and chain conveyors and offer four-way access for forklift trucks. It’s available in both open or closed deck versions.

Driven by a desire for innovation and environmental responsibility, the pallet industry has embraced the circular economy whenever possible. Reducing waste in manufacturing, usage, and transportation delivers economic benefits while at the same time respecting the natural world.





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The image shows a 4x4 grid of 16 intermodal containers. The containers are arranged in four rows and four columns. The colors of the containers are as follows:

- Row 1: Blue, Green, Red, Green
- Row 2: Yellow, Red, Red, Yellow
- Row 3: Blue, Light Blue, Red, White
- Row 4: Blue, Maroon, Yellow, Yellow

Each container has a white label with black text. The labels provide identification and capacity information. The labels include codes like 'LGEU', 'WSCU', 'CATN', and 'M.G.W. TARE'. Some containers have a white circular mark on their doors. The containers are stacked on a concrete surface, and a metal bollard is visible in the foreground.



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INTERMODAL *LEANS IN*

**In a volatile period for supply chains,
intermodal proves attractive to
shippers seeking dependability.**



Intermodal has not been immune to the coronavirus pandemic and the damage it has inflicted on the global economy. But the sector appears positioned to endure the disruption caused by the outbreak while offering an attractive option to shippers as the supply chain regains its footing—and maybe even gaining new efficiencies that will further strengthen its appeal.

Intermodal in the United States was on the bleeding edge of the COVID-19 crisis because of its reliance on imports from other nations, particularly China, says Todd Tranausky, vice president, rail and intermodal, at FTR Transportation Intelligence. The Intermodal Association of North America (IANA) reported a 6.7% decline in volume in the first quarter of 2020.

A drop in volume is common throughout the economy. “No one is untouched by this pandemic,” Tranausky says.

“It’s a whole new ballgame for all partners in the intermodal supply chain as they try to weather the storm the best they can until volumes can stabilize and then grow again,” he adds.

INTERMODAL’S ENDURING APPEAL

Intermodal traditionally is a strong option for “companies whose shipping patterns can mesh well with rails, whose drays are not too long, and who have a green agenda,” says Anthony Hatch, analyst and consultant at ABH Consulting. Intermodal has an enduring appeal to shippers because of its inherent strengths in cost, capacity, and sustainability.

Until 2019, intermodal had been on the upswing, enjoying “a long run of year-over-year volume increases,” Tranausky says. Intermodal volumes declined 4.1% in 2019, driven in part by international trade issues, according to IANA. The 2019 slowdown may have steeled the sector for COVID-19.

“Intermodal was well prepared for this because of the disruption created by the trade war,” Tranausky says. “The sector is used to volatility.”

“We’ve experienced little to no disruption to the rail service during the recent crisis,” confirms Barb Slawter,

of “D” from the American Society of Civil Engineers in 2017, while rail earned a “B,” which would have been higher without the relative struggles of passenger rail.

“This is the benefit of self-funding,” Hatch says. “Where once the subsidization of the Interstate Highway System was a competitive problem for rail, the politicization of that process has made rail’s ability to act in its own interests (adding capacity) a major advantage.”

Infrastructure in the United States positions intermodal well for the present

and future, Tranausky agrees. In particular, he points to robust rail capacity and the flood of recent ambitious improvements at major ports.

“Infrastructure constraints will not hold back growth,” Tranausky says. “If you look at where volumes are versus where the theoretical ceiling is,

there’s plenty of room to run.”

Rail has four structural advantages over the highway given density and lengths of haul, among other factors: labor, fuel, infrastructure, and financial condition, notes Hatch. He says rail will need to rely on that financial condition advantage to navigate the COVID-19 crisis and to fund capacity and IT capability as Silicon Valley and others invest in new technology, particularly electric and autonomous vehicles, that could reduce the labor and fuel advantages.

Until 2019, intermodal volumes had been on the upswing. Last year’s slowdown likely helped the sector prepare for COVID-19 disruptions.

president of Optimodal, a subsidiary of Odyssey Logistics & Technology and a provider of bulk intermodal services. “This presents opportunity for shippers that want to use intermodal to get their products from Point A to Point B.”

Intermodal also appears to have the elements in place to rebound when global trade stabilizes. Rail and intermodal enjoy a clear infrastructure advantage over trucking in the United States, Hatch notes. He points out that highway infrastructure received a grade



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Odyssey Logistics & Technology sees increasing demand in certain areas of its intermodal business because of pandemic-related challenges. For instance, ISO containers present a flexible option for clients with unexpected storage needs.



“The future battlefield will be tech-driven,” Hatch says.

Although uncertainty marks the future, Slawter is among those who see upcoming developments in the trucking industry having ramifications for intermodal.

“Trucking capacity will likely be an issue as the economy begins to recover,” Slawter says. “We expect there will be a shift to intermodal as a solution to a capacity crunch.”

Weak active truck utilization and sharply lower diesel prices will increase pressure on intermodal as the year progresses, IANA says in its first quarter report for 2020. Tranausky believes the current crisis will make intermodal more efficient, particularly as it faces stiffer competition from trucking.

“Companies will have to get creative in how they move goods and how they create value for customers,” Tranausky says. “As the freight market tightens up in 2021, intermodal certainly has potential for significant growth as shippers look for transportation options to meet their needs in a tight capacity environment.”

Those new efficiencies will take different forms. “It will be different for



every piece of the intermodal supply chain, but companies will focus on gaining economies of scale, improving operational techniques, getting the most out of capacity, finding the quickest way to market, boosting reliability in the supply chain, and minimizing service disruptions and communicating with shippers when disruptions do happen,” Tranausky says.

“The rail markets have always been slow to adapt, slow to innovate,” he adds. “But necessity is the mother of all innovation. Intermodal is going to have to compete against a newly aggressive truckload market, and that will

A TRUSTED INTERMODAL PARTNER IN A CHALLENGING TIME

While the COVID-19 outbreak threw some supply chains into turmoil, Odyssey Logistics & Technology has proved to be a steadfast intermodal partner for its clients as they navigate unprecedented challenges.

“We’re with customers all the way, keeping them informed of the latest supply chain strategies, relaying the most updated and relevant industry news and serving as a valued partner,” says Ken Stratton, vice president of operations for intermodal marketing company Interdom, a subsidiary of

Odyssey Logistics & Technology. “We know that a partner with a strong carrier network, advanced technology capabilities, and a history of success in the freight

Odyssey’s intermodal solutions move long-haul shipments via rail, providing limited personal contact to keep workers safe and healthy during the pandemic.

industry can be a guiding light in these difficult times.”

Intermodal has offered dependability in a volatile period for many of Odyssey’s clients, according to Slawter. In the early days of the pandemic, Optimodal received an influx of intermodal solution requests because of fears that drivers could fall ill.

require innovation, additional visibility, and agility.” Those potential developments offer promise for shippers interested in intermodal and hint at the possibilities for growth in the sector.

“You will see a leaner, meaner, more competitive intermodal market,” Tranausky predicts.



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Duke Realty's 19 properties are located along the New Jersey Turnpike Corridor. Key to their appeal for intermodal shipping is convenient access to the Port of New York and New Jersey, including the Port Newark-Elizabeth Marine Terminal.



Those fears subsided, but Slawter says, “Shippers who turned to intermodal in the meantime continue to utilize this mode after it proved to be a cost-effective service that helps meet sustainability goals without sacrificing service levels.

“In fact, we’re seeing increasing demand in certain areas of our intermodal business,” Slawter says, because of pandemic-related challenges. For instance, ISO containers are a low-cost, flexible option for Odyssey clients with unexpected storage needs.

“Our forward storage capabilities are particularly beneficial as demand and

times, which tend to be the best lanes for intermodal,” she adds.

Similarly, Interdom’s ability to secure equipment options for its intermodal customers to keep freight moving has provided crucial value.

“For example, we have been successful in getting equipment from a variety of sources, including 53-foot containers, during a time when 40-foot equipment has become difficult to secure,” Stratton says. “Interdom has been able to cover the freight for our existing customers.”

Odyssey’s agility, collaborative approach, and creative thinking are crucial to helping clients increase logistics capacity and improve contingency planning during the outbreak.

“We listen to the needs of our clients and what challenges they are facing at the loading facilities and with

their customers,” Stratton says. “We also understand threats the current market may pose to supply chains.

“Based on feedback, we work with clients to find the best service plan by adjusting services, schedules, or departure plans,” he says.

Ultimately, Odyssey strives to help its clients adapt and thrive in the face of disruption.

New Jersey is one intermodal hot spot. Duke Realty’s 8 million square feet of Class A properties in the state offer intermodal connections.

operations come back online,” Slawter says. “Some of our receiving locations have shut or slowed down during this time and are unsure of exact reopening dates or how quickly full demand will return. Shippers are opting to hold ISO tanks locally so that a local point of supply is ready as needed.

“This is particularly relevant on extended haul lanes with longer transit

“We will remain constant and vigilant in securing the capacity to cover the freight, work on new business opportunities and, as always, be just a phone call away for our customers,” Stratton says. “Now more than ever, we will build on and grow those existing partner relationships.”

OFFERING SUPERIOR, WELL-CONNECTED PROPERTIES IN NEW JERSEY

With its bustling ports, highways, rail lines, and airports, New Jersey represents a critical intermodal hot spot in the United States. Duke Realty, a leading owner, developer, and manager of industrial properties with projects across the country, has built an impressive portfolio of 8 million square feet of Class A properties in New Jersey after entering the state in 2008.

The company’s 19 properties, which have 26 tenants, are all located along the New Jersey Turnpike Corridor, the major north/south highway serving the highly populous Northeast area, and boast easy connections to other major highways.

“Thanks to the superior location of our assets, users have quick, easy connectivity to the New York City metro

area and other Northeast population centers,” says Art Makris, senior vice president of Duke Realty’s Northeast region. “With 2,800 miles of interstates and highways, New Jersey infrastructure provides a connection to virtually every road network and major market in the country.”

Duke Realty’s New Jersey properties have been at or near full occupancy since 2008, with 100% of its in-service portfolio occupied at the end of the first quarter in 2020. Key to the appeal of the Duke Realty properties for intermodal shipping purposes is convenient access to the Port of New York and New Jersey, including the Port Newark-Elizabeth Marine Terminal, the busiest container terminal on the East Coast and the third-busiest in the country. In 2017, the Bayonne Bridge was raised to accommodate the world’s largest containerhips, a major milestone for the area.

In addition, air transport is readily available through the properties’ close proximity to several airports, including Newark Liberty and Teterboro.

Properties also have ready access to rail resources. For instance, Duke Realty’s property at 150 Old New Brunswick Road in Piscataway, New Jersey, offers rail connectivity. The 662,000-square-foot, state-of-the-art

speculative development will be available in 2020.

“This asset has an incredible infill location, just one block from I-287

development in New Jersey. “The building will feature leading-edge amenities, such as 40-foot clear height, cross-dock loading, and ample car and trailer parking.”

Duke Realty’s New Jersey properties are among the youngest in the market, with an average portfolio age of six years, providing a competitive advantage for tenants.

“Our assets incorporate the latest features for product storage and maneuverability,” Rosen says. “Functional ingress/egress routes have been incorporated, and proximity to highways and other transport modes are a priority.”

In addition to their physical assets, Duke Realty’s service quality helps explain how the company has conducted repeat leasing transactions with 61% of tenants and repeat build-to-suit developments with 65% of customers. The company’s crucial resources include in-house construction, asset/property management, and legal and financing services, providing a one-stop shop for clients.

“Duke Realty has tremendous construction experience having performed a variety of complicated construction projects, including multiple rail-connected projects, around the country,”

Makris says. “We have built a strong reputation for delivering on our promises and meeting our clients’ needs.” ■



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by Jennifer Baljko

Any company that has gone through a merger and acquisition knows how challenging it can be to integrate manual and disparate supply chain processes across the newly combined organization.

Now imagine how IT synchronization and supply chain complexity multiplies in the wake of four acquisitions in a short time. Extreme Networks knows that pain and has lived through it.

To avoid collapsing from this type of wide-scale integration, the networking hardware and software company had little choice but to transform all its supply chain practices. A shift from manual processes to agile, automated, and scalable order management as well as supply chain planning and execution solutions proved critical.

"We were running the business with spreadsheets and phone calls," recalls Norman Rice, chief operating officer at San Jose, California-based Extreme Networks. The company operated this way only a few years ago in 2018.

"We had to overcome this business model, and we did it by instituting more rigorous processes," he adds.

IT DON'T COME EASY

It hasn't been an easy task, but a nine-month focus on multifaceted supply chain improvements, headed by Jack Lyon, vice president of supply chain, and his team, has produced unexpected advantages. Most notably, Extreme Networks has been able to withstand the impact of trade war tariffs

and ride out the current global upheaval triggered by the COVID-19 outbreak.

"If Jack Lyon and his team had not done what they've done, and if we hadn't invested in fully automating and centralizing a vendor-managed inventory (VMI) process, we never would have been able to weather the tariffs storm," Rice says. "We would have been out of business from the tariffs, let alone COVID-19. The way Jack's team has been able to mitigate this risk with new systems, processes, and Supply Chain Center of Excellence activities has made it possible for our business to continue."

THE IMPETUS OF CHANGE

Back in 2016, Extreme Networks was considered a small competitor compared to networking equipment giants Cisco and Juniper. Fiscal year revenue totaled about \$140 million, and gross margins were 52.1%. Inventory was valued at more than \$60 million, and inventory turns were approximately 3.6.

The operation ran on spreadsheets and disparate systems that didn't talk to each other. Some portions of the company operated on an Oracle enterprise resource planning (ERP) platform, while other parts used standalone sales and operations planning solutions.

CASEBOOK STUDY

Taking It to the Extreme

CHALLENGE

Merging, integrating, and upgrading supply chain processes and practices in the wake of four major acquisitions that doubled revenue to about \$1 billion.

SOLUTION

- Realign the company's supply chain structure and IT solutions.
- Redesign supply chain processes.
- Develop an agile, scalable supply chain that incorporates a single global instance for planning and execution.
- Create a Supply Chain Center of Excellence and touchless EDI.
- Leverage VMI practices at its El Paso, Texas, distribution center.
- Consolidate six warehouses into one facility.
- Adopt scalability initiatives, including robotic process automation, duty/tariff drawback processes, factory direct fulfillment capabilities, product compliance automation, and real-time operational reporting.

RESULTS

- 92% reduction in product constraints (revenue that cannot be fulfilled within the quarter due to product availability).
- 51% reduction in quarterly distribution center run rate costs.
- Approximately 20% improvement in customer-request date performance.
- Increase in touchless EDI hardware order processing from 0% to 29% within two quarters.

NEXT STEPS

Considering ways to expand or streamline touchless EDI processes to improve direct-to-customer fulfillment, and expand the robotic automation process.

Three original design manufacturer (ODM) suppliers handled 85% to 90% of its production and Extreme Networks struggled to effectively manage an average of 5,000 transaction orders per quarter.

Around this time, Extreme Networks' executive team had to make a big choice: Be the buyer or be the bought. Most of the company's bread and butter offerings were focused on enterprise-level networking solutions, whose future was moving toward automation, cloud-based processes, and the Internet of Things. Extreme Networks had to diversify and scale if it wanted to survive.

"We needed to grow so we could achieve economies of scale in terms of buying power, competitiveness, footprint, and reach," says Rice. "So we set out, with very little currency, to consolidate the space."

Extreme Networks started its acquisition spree with Zebra Technologies, closing that deal in October 2016. The company then acquired Avaya's networking business in July 2017, and followed that with the addition of Brocade's Switching, Routing, and Analytics business from Broadcom in October 2017. Lastly, the company bought Aerohive Networks, closing its fourth significant deal in August 2019.

Today, the company's annual revenue tips up to about \$1 billion, and it serves nearly 50,000 customers worldwide. The

company counts nine ODMs as its main suppliers, and order transactions have increased to 25,000 per quarter.

Although revenue and orders have witnessed strong growth, the company holds its inventory level to about \$70 million—kept in check with recently deployed inventory management processes, which have also doubled inventory turns.

The company's ability to absorb this growth directly correlates to the supply chain initiatives it implemented from late 2018 to early 2019, the short pause between acquisitions, notes Lyon.

A SINGLE VERSION OF THE TRUTH

As Extreme Networks folded in the Zebra, Avaya, and Brocade business, it became clear that it had to address its business model. Running the expanded operations with manual workarounds, Band-Aid planning and execution approaches, a mishmash of technology, and Excel spreadsheets was no longer efficient or sustainable.

The company needed one version of the truth across all its units and a way to reduce supply chain complexity. The three acquisitions enabled the opportunity to modernize the supply chain; realign planning, order, and inventory management structures; redesign processes; integrate the best practices from each acquisition; and deploy new technology where needed.



Fully automating and centralizing a VMI process at its El Paso, Texas, distribution center enabled Extreme Networks to weather disruptions caused by the trade war tariffs and COVID-19 pandemic.

“We were able to do some amazing things in a short time,” Lyon says of the nine-month timeline to onboard sweeping changes and the smooth transition to integrating the Aerohive acquisition.

One of the first supply chain restructuring steps involved evaluating the mismatch in IT systems and processes across the new combined organization, choosing the best practices and platforms to carry forward, and identifying and filling the gaps.

For instance, Zebra excelled at managing its distributors and supply levels, and enforcing regulations and rules. Avaya’s supply chain strength was in visibility. Brocade had strong vendor VMI and hub centralization practices that Extreme Networks could further develop.

With this perspective, Extreme Networks began building its Supply Chain Center of Excellence (CoE). Filtering its review through the fundamental pillars of demand, supply, manufacturing, and customer service, a dedicated supply chain and IT team focused on transformational process and technology initiatives aimed at improving performance.

“The CoE oversaw how the organization flowed, from when the order management team received initial orders to when payments came in the door,” says Lyon. “We removed all the stovepipes of the supply chain to see how we could streamline it and make it more efficient. After that, we tackled process automation and optimization.”

CONSOLIDATING DATA FLOWS

The company conducted some trials with a few technology providers, and chose to go with the RapidResponse solution from Kinaxis, which had been working with Avaya for seven years prior to the acquisition. The platform became Extreme Networks’ end-to-end global demand, supply, and inventory management tool.

The technology consolidates multiple data flows from multiple sources and gives Extreme Networks complete



After implementing the Kinaxis RapidResponse solution, Extreme Networks improved the productivity of its planning workforce, allowing it to focus on optimizing inventory levels to reduce carrying costs. This, in turn, expedites service delivery to improve customer satisfaction.

supply chain visibility, which, in turn, allows the company to better plan and execute on-demand, supply, and inventory fluctuations.

Extreme Networks then partnered with five of its key distributors to establish a touchless electronic data exchange (EDI) ordering process—a much-needed transition from the manual processes that had a significant number of human touch points.

The touchless EDI allows orders to be submitted electronically through Extreme Networks’ Oracle-based ERP system and automatically validated, booked, and sent to the third-party logistics provider for fulfillment.

Starting from zero, the company moved about 29% of its hardware orders through the touchless process within two quarters of its rollout. And while the touchless EDI transactions have increased, Extreme Networks plans to reexamine how it can better manage, automate, and streamline the higher volume of direct-to-customer fulfillment requests it receives.

In addition to the Kinaxis deployment and the touchless EDI shift, Extreme Networks also leveraged the VMI technology Brocade used with its outsourced provider, a subsidiary of Foxconn, at its distribution center in El Paso, Texas. As a result, Extreme Networks consolidated its two legacy

warehouses and Avaya’s three warehouses into Brocade’s technologically advanced site. The company now does VMI with eight or nine of its key ODM suppliers.

“These moves went a long way toward helping us reduce inventory in addition to the efficiencies and process improvements we realized with the Kinaxis solution,” says Lyon. “They work in parallel to streamline and augment our metrics from a supply chain perspective.”

THE PAYOFF

Several metrics have seen a boost since Extreme Networks embarked on its supply chain restructuring. The company reports a 92% reduction in product constraints (or revenue that cannot be fulfilled within a quarter because of product availability constraints); a 51% reduction in quarterly distribution center run rate costs, and an approximate 20% improvement in customer request date performance.

The supply chain investment is also paying off as the world deals with the fallout caused by the COVID-19 pandemic. Because Extreme Networks improved its inventory and supply chain visibility capabilities, Rice says the company is in a better position to anticipate, manage, and adjust for supply and demand fluctuations. It hopes to see minimal disruption as factories, suppliers, and customers come back online. ■

IN THIS SECTION:

DC Management – Furniture Transport & Logistics

DISTRIBUTION CENTER MANAGEMENT



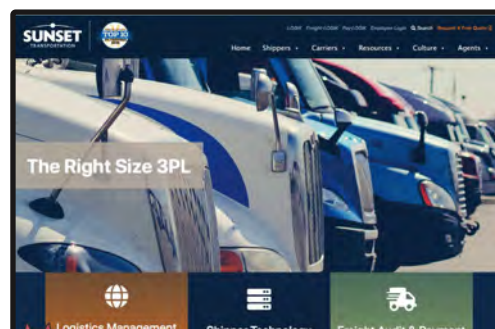
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FREIGHT PAYMENT/AUDIT SERVICES

SUNSET TRANSPORTATION • www.sunsettrans.com

Sunset Transportation isn't just another 3PL. We are driven by the right-size fit for each business, using all levels of global and domestic supply chain resources and services. Our culture allows customers to feel like family, while offering advanced TMS solutions, reporting, and shipment reliability. Our approach is simple: through analysis of historical shipping data, we identify opportunities for optimization, service improvement, and technology enhancements. All this is done with five promises we make to every customer, every day: savings, visibility, data-driven decisions, continuous improvement, and relationships. Sunset is the right size 3PL for your growing business.



FULFILLMENT



SADDLE CREEK LOGISTICS SERVICES • www.sclogistics.com

Saddle Creek is an omnichannel supply chain solutions company providing a variety of integrated logistics services, including warehousing, fulfillment and transportation. Our custom solutions leverage advanced operational methods and sophisticated technologies to help retailers, manufacturers and e-commerce companies get products where they need to be quickly, cost-effectively and seamlessly. For more information, visit www.sclogistics.com.

FURNITURE TRANSPORT & LOGISTICS

NORTH CAROLINA STATE PORTS AUTHORITY • www.ncports.com

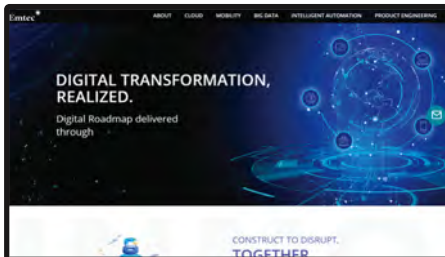
North Carolina Ports has convenient locations in Wilmington and Morehead City, plus an inland port in Charlotte. Our customer-focused approach offers shippers excellent port communication and customized service. Customers experience the fastest turn times on the United States East Coast, with Wilmington featuring three neo-Panamax cranes and a new, 101,000-square-foot, on-terminal storage facility that can accommodate more customers than ever.



IN THIS SECTION:

Logistics IT - Supply Chain Mgmt./Optimization

LOGISTICS IT

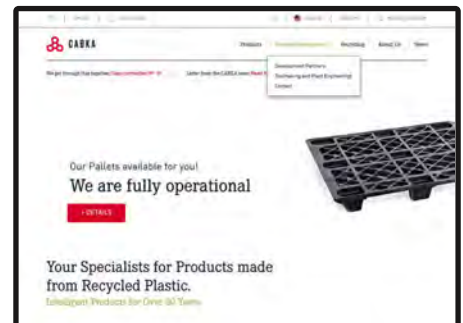
EMTEC • www.emtecinc.com

Emtec is an IT consultancy helping logistics and supply chain clients drive transformation and growth initiatives through the latest digital technologies. These initiatives are aimed at employee empowerment, accelerating innovation and delivering amazing client experiences. Emtec Digital provides technology advisory, applications, analytics, and support services leveraging intelligent automation, cognitive services, cloud, data analytics, and mobility. We help clients in areas like automating and optimizing performance for 3PL, real-time fleet management, scheduling-routing, demand predictions, dynamic pricing, etc.

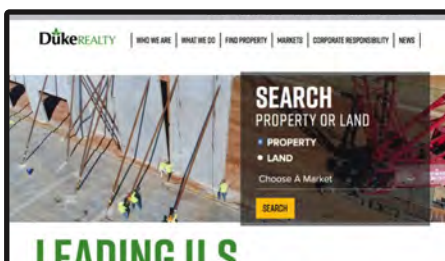
PALLETES

CABKA NORTH AMERICA • pallets.cabka.com

CABKA North America manufactures custom and standard plastic pallets, boxes, and containers. Products include nestable and hygienic pallets that are available in various dimensions, load capacities, and configurations. Available in recycled to high grade materials, applications include meat processing, pharmaceutical, beverage, brewing, automotive, mining, pooling, food, and healthcare.



REAL ESTATE

DUKE REALTY • www.dukerealty.com

Duke Realty Corporation owns and operates approximately 156 million rentable square feet of industrial properties in 20 major U.S. logistics markets. Duke Realty is publicly traded on the NYSE under the symbol DRE and is listed on the S&P 500 Index. The company maintains a Baa1 rating from Moody's Investor Service and a BBB+ rating from Standard & Poor's Financial Services.

SUPPLY CHAIN MANAGEMENT/OPTIMIZATION

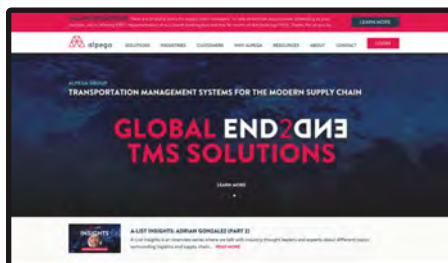
MPO • www.mpo.com

MPO is the world's only unified cloud supply chain platform that combines Distributed Order Management, Transportation Management, and Control Tower capabilities. The software enables companies to delight customers, maximize revenue, and minimize costs. MPO complements existing enterprise systems to orchestrate orders, inventory, and transportation, across networks of business partners.



IN THIS SECTION: TMS

TMS



ALPEGA NORTH AMERICA • www.alpegagroup.com

Alpega's cloud-based TMS solutions connect supply chain partners across logistics ecosystems via a SaaS platform to collaboratively manage end-2-end transportation activities. Global, flexible and modular, Alpega solutions address the needs of simple to complex logistics networks and can stand-alone, integrate, and scale appropriately. Through collaboration with trading partners, increased visibility across networks, and improved asset utilization, companies can reduce freight spend and carbon footprint—providing an efficient, sustainable logistics IT solution for today's supply chain.

AR TRAFFIC CONSULTANTS • www.artraffic.com

AR Traffic has been providing shippers with advanced transportation management software and third-party logistics services since 1964.

All its products and services are designed to improve your efficiency, accuracy, record-keeping, control and auditability as well as to lower your freight costs. For a free study to show how you can cut costs, improve customer service, and streamline your business, visit the website today.



enVISTA • www.envistacorp.com

enVista is a leading global transportation spend management solutions company with experts around the globe who help clients reduce cost and improve visibility throughout their worldwide operations. enVista's audit and payment service utilizes myShipINFO®, our proprietary, transportation cost management platform, which includes unit of measure, currency conversions, multi-lingual translations, and VAT calculations to ensure carrier compliance for global shippers and 3PLs.

FORTIGO • www.fortigo.com

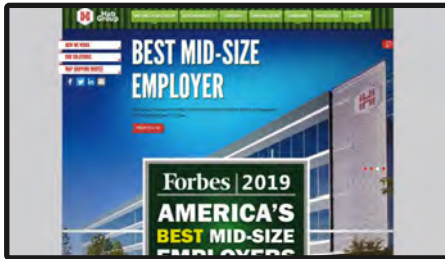
Fortigo's team of experts specializes in logistics optimization and enterprise web-based software. For companies seeking to reduce costs, improve customer satisfaction, and increase profitability, Fortigo automates, optimizes, and audits logistics decisions. Fortigo plugs into established supply chain applications and provides rapid return on investment by optimizing and deploying closed-loop logistics processes, minimizing ship-to-order times and streamlining collaboration with logistics providers.



IN THIS SECTION:

TMS

TMS

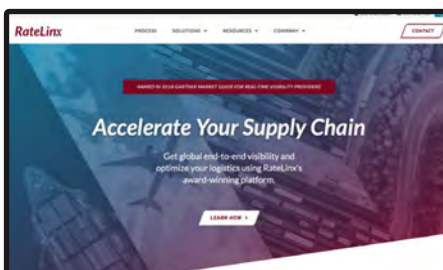
**HUB GROUP • www.hubgroup.com**

Hub's extensive service network—built over many years—enables it to provide innovative transportation solutions that are versatile, flexible, and designed to deliver maximum efficiency. With this advantage, Hub Group is able to collaborate with customers daily to help them meet their transportation challenges. With intermodal, highway, and logistics transportation offerings, the Hub Network is your single source—coast to coast, border to border. Visit the website to learn what Hub can do for you.

PRINCETON TMX • www.princetonmx.com

Princeton TMX offers a transportation management solution utilizing the most modern software available. It empowers shippers to focus their resources on exceptions, while providing management with the tools to better analyze and minimize transportation expenses. Princeton TMX products are offered as a Software as a Service (SaaS) solution.

These solutions are integrated with customers' systems to create a seamless experience for users. Princeton TMX's software modules are configurable to meet customers' specific business requirements.

**RATELINX • www.ratelinx.com**

RateLinX delivers all your logistics data in one cloud-based platform with accurate data, advanced analytics, and reports to power visibility across orders, tracking, and invoices. The PayLinX module uses AI-driven data quality to enable freight spend control and real-time visibility, eliminating exceptions, and rate tolerances. Improve decision making and carrier partnerships with PayLinX. Accelerate your supply chain and connect with other RateLinX modules to maximize your visibility and savings.

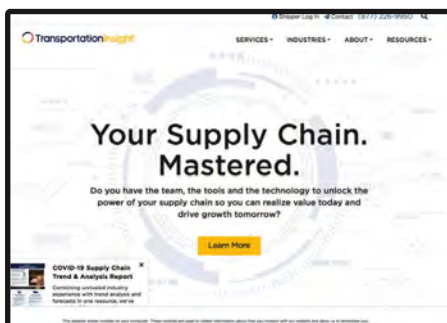
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IN THIS SECTION: TMS – Warehousing

TMS



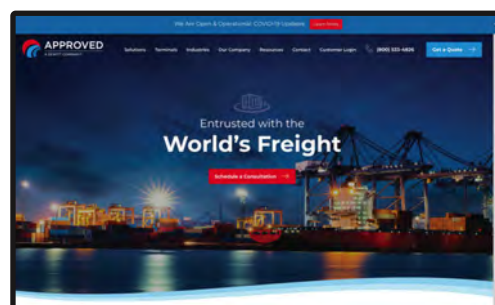
TRANSPORTATION INSIGHT • www.transportationinsight.com

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WAREHOUSING

APPROVED FREIGHT FORWARDERS • www.approvedforwarders.com

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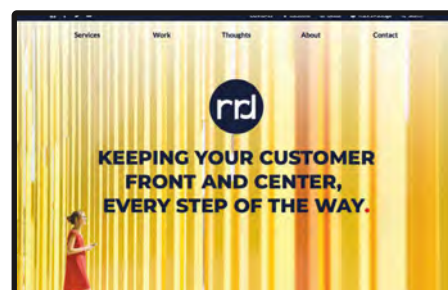


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IN THIS SECTION:

Warehousing – Workbenches

WAREHOUSING

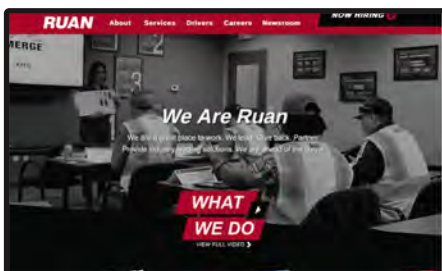
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Over land, on the water, in the air—or in any combination—Lynden has been helping customers solve transportation problems for almost a century. Operating in such challenging areas as Alaska, Western Canada and Russia, as well as other areas around the globe, Lynden has built a reputation of superior service to diverse industries.

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Phoenix Logistics listens carefully to your logistics needs and responds with innovative solutions. By implementing technology, materials handling equipment, and specialized personnel in a perfectly matched and ideally located facility,

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bit.ly/COVIDContinuity

Business Continuity Requires an Enterprise Approach to Shipping from Home

Offered by Pierbridge

Instead of managing four offices, companies must now manage 4,000 as employees work from home during the COVID-19 pandemic—all without a centralized mailroom. This e-book shows how a cloud-based, multicarrier management solution can maintain centralized control while giving employees the tools to efficiently ship materials from home.

Supply Chain Insights

whitepapers



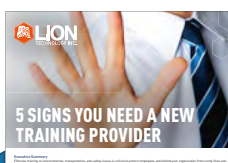
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bit.ly/GlbTranz12102019EB

How Do Your 3PL Relationships Measure Up?

Offered by GlobalTranz

Supply chain leaders often seek to drive more value from their relationships with third-party logistics (3PL) providers, but what they often lack is a framework outlining the relationship types and benefits. This research, based on interviews with global organizations and more than 100 inquiries on the topic of management, sets out that framework and guides leaders on how to apply it.



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5 Signs You Need A New Training Provider

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Training employees to manage and ship dangerous chemicals is not a rote exercise intended to check off a box—one mistake can lead to serious injury, death, evacuations, hospitalizations, highway closures, and lasting environmental contamination. Make sure your personnel training meets high standards when it comes to quality, accuracy, and knowledge retention.



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To be successful during disruption, businesses must plan and practice *before* the event. Then, when the event occurs, your team must be able to gather and share accurate data quickly. Download this free whitepaper to learn how supply chain leaders can rise to the challenge with a one-team approach during disruptive events like COVID-19.

podcast



Steve Syfan

Keeping Truckers Safe in the Face of COVID-19

Guest: Steve Syfan, Executive Vice President, Syfan Logistics

Truckers always step up without hesitation to keep freight moving, whether it means weathering hurricanes and icy roads or driving into COVID-19 hot spots. Steve Syfan, executive vice president of Syfan Logistics, shares how his company is striving to keep workers safe and stop the spread of COVID-19 while delivering essential items.



[IN FOCUS]

SPOTLIGHT

Labeling Solutions

> ASG Cold Store Labels:

These labels from ASG Services support warehouse labeling in operational freezers where adhesives tend to freeze and alternatives are costly. Featuring a reinforced adhesive, the labels can be applied in temperatures as low as -65°F. ASG's software processes variable data to create these multi-field freezer labels.



> **SATO America PV3:** The mobile 3-inch thermal printer is designed for warehouse use and offers a large roll capacity, long battery life, and a built-in dispenser. Made of polycarbonate and rubber overmolding, the device can withstand drop impacts of up to 6.9 feet. Designed to eliminate mislabeling and increase order accuracy, the PV3 features fast data processing and printing speeds up to 5 inches per second as well as connectivity across multiple networks.

> **Software Spectrum:** This software solution allows companies to maintain continuous labeling operations across multiple sites. It can be deployed to company locations with each running independently and synchronizing to the central location when needed to access standard and approved label content and templates. In the event of a shutdown or supply chain disruption, remote facilities can maintain uptime until the connection is restored.



> Monarch Pathfinder 6059:

This intelligent one-piece inventory management tool from Avery Dennison allows users to quickly and accurately capture inbound shipment data as well as print and apply routing labels to individual packages. The device offers both an RFID and non-RFID model. The handheld Pathfinder can encode RFID technology into the inlay of a label and can print the encoded label to support product tracking and transparency throughout the supply chain.

> Clean Release Removable Label:

ID Label's new solution has an advanced adhesive that clings tightly to virtually any surface and stays securely in place for years but is easily removable and reusable without leaving behind any residue. The label lets companies remove and relabel warehouse locations and containers as inventory and information changes, eliminating the need to scrape off old labeling and clean and treat racks, beams, totes, and shelves.



> M2Smart Data Device: This handheld device from ACD Group lets users customize its modules depending on their supply chain needs. For instance, users can choose a printer module for labeling and an RFID module for tracking inventory. With an integrated scanner and camera, the device comes with a slide mechanism to enable modules to be swapped in without any tools, supporting multiple functions and addressing chain-of-custody concerns.

> Confidex Ferrowave Classic: Part of the new Confidex Go family of RFID labels for logistics applications, the Ferrowave Classic is ideal for labeling metallic foils and liquid containers. In particular, the label is designed for tagging automotive components and consumer packages. Confidex Go labels can be scanned from all angles and feature an eco-friendly paper-based structure.



> FP2 Thermal Barcode Printer:

The new barcode printer from Toshiba America Business Solutions is lightweight and portable, producing high-speed (up to 6 inches per second) labels and 2-inch receipts for logistics, materials handling, and retail applications. One-step, drop-in media loading optimizes productivity. The printer produces shipping and markdown labels at the point of application to save time retrieving labels from a central area.



[IN FOCUS]

INBRIEF

New Services and Solutions

>PRODUCTS

> **Southworth Products'** Model GTU-500 Gaylord filter moves parcels from gaylords and large containers onto conveyors and automated sortation systems. The filter tilts loads to provide controlled emptying, and its pan-style platform sits flush with the floor when lowered, allowing hand pallet trucks to place and retrieve gaylords.

> Materials handling products manufacturer **Steel King Industries** released the SK Scrap Hopper, an industrial steel container with a 4,000-pound capacity and corrugated steel sides. Its heavy-duty swivel casters and push handle make it easy to maneuver and position.

> **Atlas Molded Products** released the DuraTherm Fold Flat, a 100% recyclable foam cooler that folds flat for transportation, storage, and reuse. Its interlocking hinge allows a complete thermal seal without tape or film in a box, and reduces the space needed to store empty coolers.

>SERVICES

> **The Port of Savannah** added container slots totaling nearly 5,000 TEUs of space, allowing greater scheduling flexibility for the

36 containership services that call on the port. Its Garden City Terminal also provides on-terminal rail service from CSX and Norfolk Southern, three major truck gates, and 50 truck lanes.

> **APM Terminals** made storage space available for importers facing unexpected demand. Storage is available at its five North American terminals: Los Angeles, California; Elizabeth, New Jersey; Mobile, Alabama; Miami, Florida; and Lazaro Cardenas, Mexico.

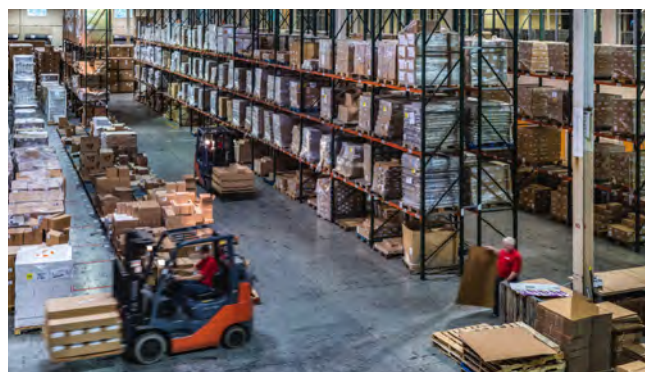
> **Kerry Logistics Network** moved its airfreight division to a new facility near London Heathrow Airport. The facility provides a temperature-controlled bonded warehouse, including deep frozen storage, pick-and-pack machinery, and vacuum cooling, to meet delivery schedules and shelf-life requirements.

>TECHNOLOGY

> **Sewio**, a real-time location technology solution, is providing free consulting and software licenses to help manufacturers implement its employee safety technology. The system tracks employees' locations to help prevent the spread of COVID-19 by monitoring those who come into contact with an infected person.



> **Beumer Group** developed the BG Sorter Compact Cross-Belt, suitable for small, light shipments as well as parcels weighing up to 26 pounds. The gentle sorter can handle fragile goods and packaging that are difficult for conventional equipment to handle, such as smooth plastic film.



> **Averitt Express** opened an international distribution center to service the Port of Houston. Located fewer than five miles from the Barbour's Cut and Bayport Container Terminals, the facility features 250,000 square feet of enclosed space.



> **DHL Global Forwarding** launched a 100-ton weekly airfreight service for organizations and governments shipping goods from China to Africa and the Middle East. DHL will consolidate cargo from across China into Guangzhou and transport it via Dubai to destinations across Africa and the Middle East in two to three days.

> **Presto Lifts** created the P3 Operator Controlled Load Leveler to increase productivity and improve worker safety during manual pallet loading. The unit can be raised or lowered to position the top layer of boxes at the most accessible height. The platform has an integrated turntable that allows users to work from one spot.



> **Virgin Atlantic**

Cargo now operates weekly flights from Heathrow Airport to Shanghai, China. The U.K. Department of Health and Social Care will use cargo capacity on two flights to deliver personal protective equipment and medical supplies.



> **Elemica**, a cloud-based digital supply network, added new features to its suites to enhance product safety and customer experiences. The features include improved shipment visibility, track and trace, electronic proof of delivery, visual route progress, and self-service data enrichments.

> Responding to demand spikes caused by COVID-19, final-mile platform **OneRail** introduced QuickStart, a service that helps retailers launch and scale deliveries nationwide at no cost. When consumers place an order, the platform automatically dispatches it to a courier and provides tracking and data to clients and consumers.

> **Roadrunner Freight** released a technology that digitizes the paper bill-of-lading process, helping less-than-truckload shippers electronically submit shipping documents. The technology enables digital rate requests, bill-of-lading creation, document sharing, shipping label creation, and pickup requests.

> **TRANSPORTATION**

> **Dachser Americas** expanded its less-than-containerload (LCL) service to provide more reliable schedules, expedited transit times, and improved visibility to meet increased demand.

> **cargo-partner** expanded its LCL rail transport as COVID-19 causes capacity shortages. The logistics provider started two weekly flights between Duisburg, Germany, and Hefei, China, as well as between Linz, Austria, and Xi'an, China.

> **Delta Cargo** initiated international charters to help shippers transport cargo during the COVID-19 outbreak. A total of 13 U.S. airports and more than 70 airports globally participate in the program.

> **Logistics Plus** offers a FAST-BOAT shipping service to help importers transport critical shipments from China, providing expedited customs clearance, transloading, and delivery to any U.S. location.

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Demand distortion

Significant, short-term change in product demand due to drastically different consumer behavior.



Floating storage

Using containerships to store product while weathering demand disturbances.

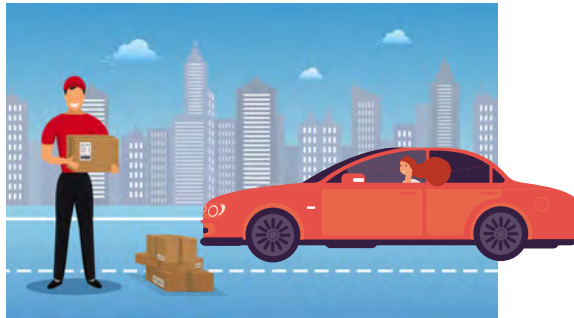


Pivot

Quickly execute a sharp move away from normal manufacturing or logistics operations to address an immediate need for a product or service.

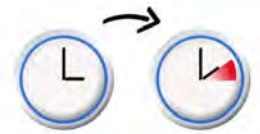
THE LAST MILE

Logistics Outside the Box



BODFC

Buy-online-deliver-from-curb model used for e-commerce fulfillment to minimize contact between consumer and retail employee.



Redeploy

To transition workers into new shifts or duties in response to changing demand.



Hyperlocal logistics

Sharpened focus on residences as the final point of destination for distribution operations.



Buffer stock or Emergency inventory

Excess product in storage beyond what just-in-time strategies call for, to prepare for supply chain disruption.

Logistics Lexicon

FOR THE TIMES
[PART 2]



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