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April 2020

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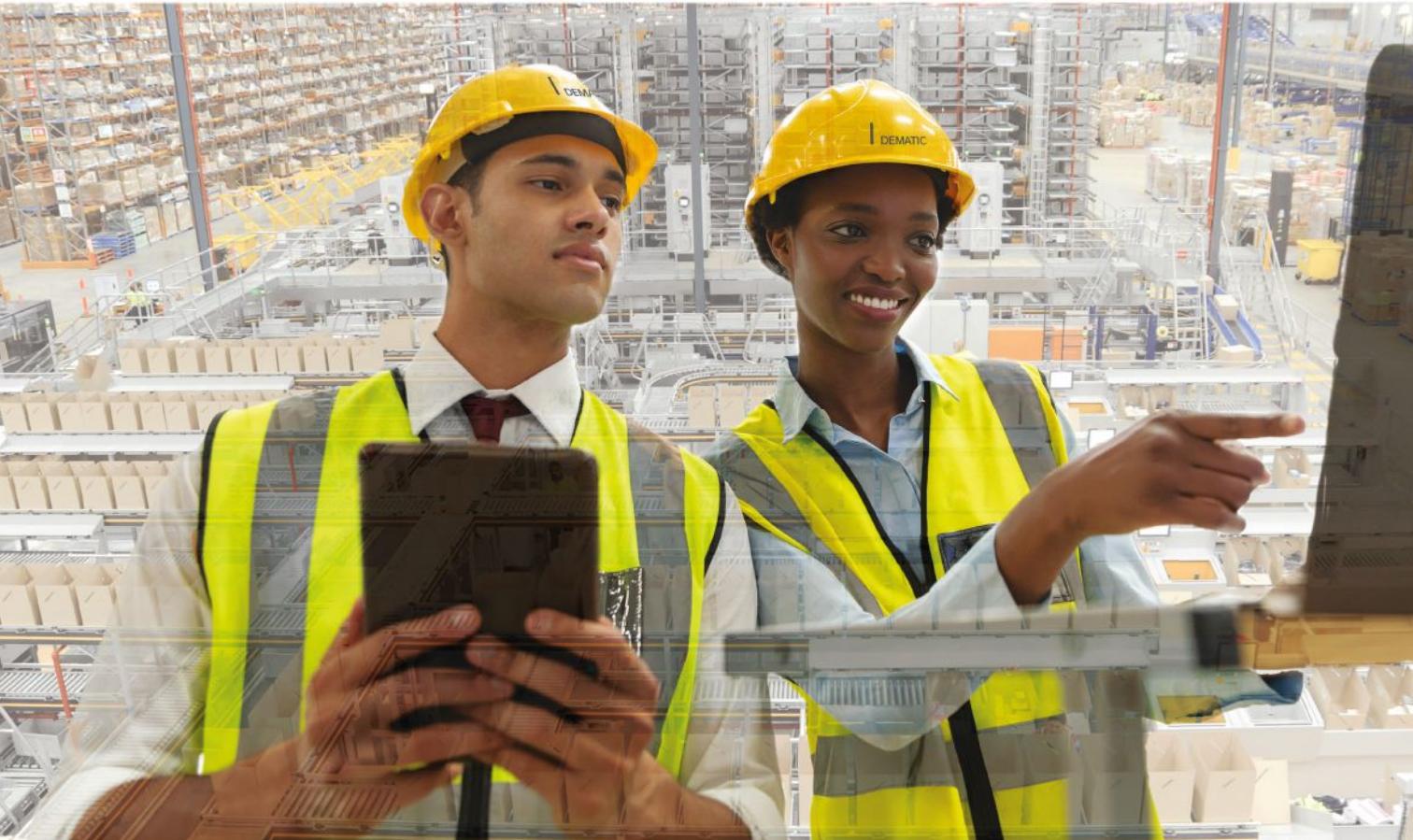
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supply chain director
for Varner AS

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MHI coordinates with ALAN to respond to Covid-19 pandemic



MHI is coordinating with the American Logistics Aid Network (ALAN) on supply chain continuity and critical healthcare resources in response to the Covid-19 pandemic. ALAN is working with multiple government and private sector organizations including Healthcare Ready to strengthen healthcare supply chains through collaboration with public health and private

sectors. Currently, there is a dire shortage of personal protective equipment and cleaning and disinfecting supplies. If you are able to donate any of these items, visit the ALAN donation form atalanaid.org/offerinkind/.

According to the National Business Emergency Operations Center, acute stock-outs in stores and online continue across the United States as prolonged, heightened consumer demand has

caused distribution backlogs slowing resupply efforts. Private sector supply chains are running at high freight volume, but overall capacity remains normal; there are no current shortages reported on the production side. However, deliveries are expected to be impacted by state and local restrictions, inhibiting the ability of businesses and supply chains to continue service to affected communities.

Fetch Robotics announces integrated fulfillment solution with Zebra Technologies

Fetch Robotics announced a collaboration with Zebra Technologies to optimize and automate warehouse



picking processes through the integration of Fetch's autonomous mobile robots (AMRs) and Zebra's FulfillmentEdge software.

The solution optimizes picking across multiple orders for piece, case and pallet workflows. By dynamically optimizing and orchestrating the movement of warehouse workers and robots, FulfillmentEdge and Fetch AMRs enable collaborative picking for faster, more accurate fulfillment while minimizing workers' non-value-added movement.

The solution dispatches workers and robots collaboratively in optimized pick paths across multiple orders, turning manual material movement into productive picking time. Worker and AMR movements can also interleave other tasks like replenishment.

In addition, FulfillmentEdge can direct Fetch AMRs to other non-picking operations such as removal of recycling, reverse logistics and restocking of packing stations to maximize robot utilization. The solution also makes it easier to train workers for new workflows, reducing training and onboarding time up to 90%.

Packsize and 6 River Systems collaborate

During Modex, on-demand packaging technology provider Packsize showcased a next-generation integration with fulfillment solution provider 6 River Systems. The demonstration highlighted accelerated automation in the warehouse and provided tips for attaining flexible packaging solutions in retail locations.



Representing a ship-from-store environment, a Packsize iQ3 combined with 6 River Systems' collaborative mobile robot called Chuck. By integrating directly into a company's warehouse management system, right-sized cartons can be created and paired with Chuck to help operators minimize walking while ensuring a sustainable box for every order. The collaboration can make labor more efficient and reduce material and shipping-related costs, while optimizing fulfillment in a small footprint.

According to joint customer Larry Emmert, vice president of operations at Legend Valve, "The integrated solution has had an immediate positive impact on our productivity, packaging and transportation costs. We would not have realized these improvements without a tightly integrated solution delivered from both of these partners."

Vecna Robotics expands partnership with UniCarriers Americas

Vecna Robotics, a materials handling automation provider, announced an expansion of its partnership with UniCarriers Americas, part of the Mitsubishi Logisnext family companies.

Through this partnership, UniCarriers will manufacture and promote their pallet jacks running Vecna Robotics' Pivotal automation software.

This alliance enables Vecna Robotics to satisfy demand for automation solutions among its customers, which include some of the largest retailers, 3PLs and manufacturers in North America. Vecna Robotics is also working with UCA to leverage UniCarriers'



Authorized Dealer network of 125 dealers throughout the Americas. Through this support network, customers can expect rapid response times in the field, further improving the already best-in-class uptime offered by Vecna Robotics autonomous mobile robots (AMRs).

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COVER STORY



Anders Eriksson,
Varner AS supply
chain director



System walk
through,
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Photos courtesy of Swisslog

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MANUFACTURING



60 seconds with...
Russ Meller,
Fortna Inc.

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Modern Materials Handling® (ISSN 0026-8038) is published monthly by Peerless Media, LLC, 111 Speen Street, Suite 200, Framingham, MA 01701. Annual subscription rates for non-qualified subscribers: USA \$139, Canada \$219, Other International \$269. Single copies are available for \$20. Send all subscription inquiries to *Modern Materials Handling*, PO Box 677, Northbrook, IL 60065-0677 USA. Periodicals postage paid at Framingham, MA and additional mailing offices. POSTMASTER: Send address changes to: *Modern Materials Handling*, PO Box 677, Northbrook, IL 60065-0677. Reproduction of this magazine in whole or part without written permission of the publisher is prohibited. All rights reserved. ©2020 Peerless Media, LLC.

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THIS MONTH IN MODERN

MICHAEL LEVANS
GROUP EDITORIAL
DIRECTOR



Investment will need to stay strong

One safe assessment in the wake of the pandemic is that investment in warehouse/DC software and automation is only going to remain robust through 2020 and beyond. While our annual "Warehouse and Distribution Center (DC) Equipment Survey" was fielded over January and February, our research team contends that the emphasis on faster, more efficient e-commerce fulfillment will only be magnified by the current situation.

"As we adjust to the new normal that's coming in the near term, it's clear e-commerce fulfillment will remain vital," says editor at large Roberto Michel, who puts context around all of the findings starting on page 26. "That's why I'm confident that longer term, the survey's overall direction—healthy investment in warehouse automation and logistics optimization—will hold true."

Norm Saenz, managing director of supply chain strategy and logistics at consulting firm St. Onge, a partner in our survey, agrees. Over the first few weeks, he was seeing the impact of the pandemic pushing many industries—such as grocery and food distributors as well as medical supply companies—to the limits of their capabilities, while others were experiencing a drastic slowdown in their demand. "Those retailers and others are now, more than ever, relying on e-commerce fulfillment capabilities," says Saenz. "The surge in pent-up demand is going to have companies looking hard at automation, so they might need less square footage and better control on labor costs."

According to Don Derewecki, a senior consultant with St. Onge, the concepts that were

emerging prior to the pandemic and trending high in our survey are sure to see wider adoption and will continue to accelerate into the future.

"For example, the increased use of 'cobots' and autonomous mobile robots to cope with surges will help make businesses less dependent on seasonal and emergency staffing," says Derewecki. "At that same time, the need for 'hyperlocal' micro-fulfillment centers, particularly inside grocery stores to fulfill online orders for either customer pickup at the store or delivery to the customer, will only gain more attention."

It may be tough to remember how we were all feeling before the virus spread, but few of the key findings may jog your memory. Among the key spending findings was a drop in those saying they were "holding off" on investing. This year, only 8% said they were holding off, compared to 15% last year.

When asked how 2020 spending would compare to 2019, 36% expect an increase in investment while 57% expect it to stay level—pretty much right on track with our 2019 findings when 54% said it would stay the same. One area that's bound to see an uptick from our survey numbers will be the percentage of those who put 3PLs to work—it stood pat at 16% this year.

"I believe companies may look to hold more inventory," adds Saenz, "and this would result in companies looking for additional warehouse space and more labor, so they'll be turning to 3PLs. However, since I believe there's going to be a lot of companies looking to revitalize their supply chains, each company will have their own journey to define the areas of operation that need to be strengthened." ■



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NEWS & TRENDS

MODEX NEWS

Defying the odds, Modex celebrates MHI's 75th year

In the face of adversity, MHI welcomed more than 16,000 attendees, celebrated its 75th anniversary and crowned the winners of the annual MHI Innovation Awards.

BY JOSH BOND, SENIOR EDITOR

MANUFACTURING AND SUPPLY CHAIN professionals converged on Atlanta's Georgia World Congress Center in March for Modex 2020, enjoying elbow bumps and valuable face time even as news of the coronavirus was growing.

Modex exhibitors noted high visitor engagement, noting that attendees were serious buyers looking for solutions for their manufacturing and supply chain operations.

"I was pleasantly surprised and encouraged by the attendance, given Covid-19 concerns," said George Prest, MHI CEO. "More importantly, attendees had immediate needs for supply chain equipment and technologies and had buying plans in hand. We were very thankful for the 894 exhibitors that were on display. It says a lot about our industry and how we



come together. The supply chain will be critically important during these challenging times."

Because of the number of registered attendees who could not attend Modex, plans are underway to create a virtual Modex 365 expe-

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Live," came with timely jokes and occasionally pushed beyond the PG-13 threshold.

Jost quipped that Modex persevered in the face of a global pandemic even as Boston canceled St. Patrick's Day celebrations, "which is like canceling Christmas at the North Pole." Citing the MHI website, Jost said he couldn't think of a better time to meet face to face with visitors from more than 150 countries.

"I honestly can't figure out what this event is about," Jost admitted. "I looked at the Show Daily and saw topics like robots, data and analytics. Then I saw Nikki Haley and Peyton Manning and an advertisement for shelves. I only came because I thought Modex was the name of the vaccine."

The dominant trend at Modex was digital supply chain solutions, including automation, robotics, artificial intelligence, autonomous vehicles, augmented reality, the Internet of Things and data analytics.

These trends were also evident in Modex Supply Chain Conference sessions which included 140 educational seminars and four keynotes. On March 9, Former U.N. Ambassador Nikki Haley spoke about her experiences in leadership and government. Emotive's Olivier Ouillier discussed how neurotechnology can improve supply chain workplace safety and productivity through data aggregation and analysis during the March 10 keynote.

On March 11, MHI's George W. Prest and Deloitte's Thomas Boykin

released the findings of the "2020 MHI Annual Industry Report: Embracing the Digital Mindset: Connecting Data, Talent and Technology in Digital Supply Chains" during a panel discussion with a keynote panel of industry thought leaders.

The March 11 afternoon keynote featured Archie and Peyton Manning who delighted the audience with funny and poignant accounts of their take on football, teamwork and leadership.

During Industry Night, MHI announced the winners of several awards including the 2020 MHI Innovation Awards. The MHI Innovation Awards serve to educate and provide valuable insights on the latest manufacturing and supply chain innovative products and services.

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— Tim Jablon, President
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Best Innovation of an Existing Product:

OPEX for Perfect Pick HD & Sure Sort Micro-Fulfillment Solution

Best IT Innovation:

Yard Management Solutions for Yard Management Solutions

The MHI Young Professionals Network (YPN) honored recipients with its annual awards. John Rosenberger from The Raymond Corporation was awarded the 2020 MHI YPN Mentor Award and Lisa Richardson from Hytrol was awarded the 2020 MHI YPN Outstanding Young Professionals Award.

Modex Student Days introduced 124 high school and university students and educators from 23 schools to career opportunities in material handling, supply chain and logistics through hands-on learning and networking with industry professionals. This year's Student Days combined an interactive educational session with a dynamic guided tour of the show floor.

The next MHI-sponsored trade event will be ProMat 2021 held April

12-15 at Chicago's McCormick Place. For more information on exhibiting at ProMat, or to register as an attendee, visit promatshow.com. The next Modex will be held at the Georgia World Congress Center in March 28-31, 2022.

Based on the information from the WHO, CDC and local authorities at the time with regard to Covid-19, Modex 2020 was held as scheduled March 9-12 with 894 exhibits covering 355,790 net square feet. Adding in show floor theaters and networking areas, the total footprint was 900,000 square feet. While registrations for Modex totaled 33,460, representing an 8% increase over Modex 2018, actual attendance was 49% of registration due to Covid-19 travel restrictions. ■



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SUPPLY CHAIN ANALYSIS

Modex 2020: MRO, ML and AI

BY BOB TREBILCOCK, EXECUTIVE EDITOR

There's a lot of buzz around Artificial Intelligence and Machine Learning. One promising area has been demand planning. Another has been MRO. The idea is that by putting sensors on motors, gears and other critical components that measure conditions like heat, voltage output and vibration, a technician can better predict when that piece of equipment might fail.

So where are we? That was one of the questions I put to Phil Jones, Target's director of supply chain engineering, and Phil Gilkes, a regional maintenance manager with Dollar Tree, during a symposium put on by the National Center for Supply

Chain Automation. The framework for that question was an asset management maturity model Jones put together, illustrating the progression from an MRO organization. According to Jones and Gilkes, condition based and predictive maintenance is the goal, but, both organizations are somewhere between Level 0 and Level 2. Both are investigating putting sensors on machines to monitor conditions, but neither was there yet—or not beyond pilots. And, these are two large organizations with a network of DCs and experience with automation.

One of the challenges for the MRO industry to get to that Level 4 is data. To produce reliable and actionable results, AI and ML need lots of data. Otherwise, the risk is that the system "will start flagging issues that aren't really issues," noted John Sorensen,

senior vice president of lifecycle performance services at MHS. Where does a progressive maintenance team start? Sorensen and Rob Schmidt, MHS's senior vice president of distribution and fulfillment, recommended a crawl, walk, run, sprint approach.

Don't try to put sensors on every motor and gear. Start by categorizing components and equipment according to criticality. Running until it breaks might be appropriate for some pieces of equipment, if spare parts are in inventory and the it's is easy to fix. A limited number of sensors might be appropriate on more critical items, like a PLC. Finally, a broad array of sensors can begin to gather important operating data in bulk on critical items where reliability counts. Sorensen added, "You might just need a data set of 200 sensors to begin the journey." ■

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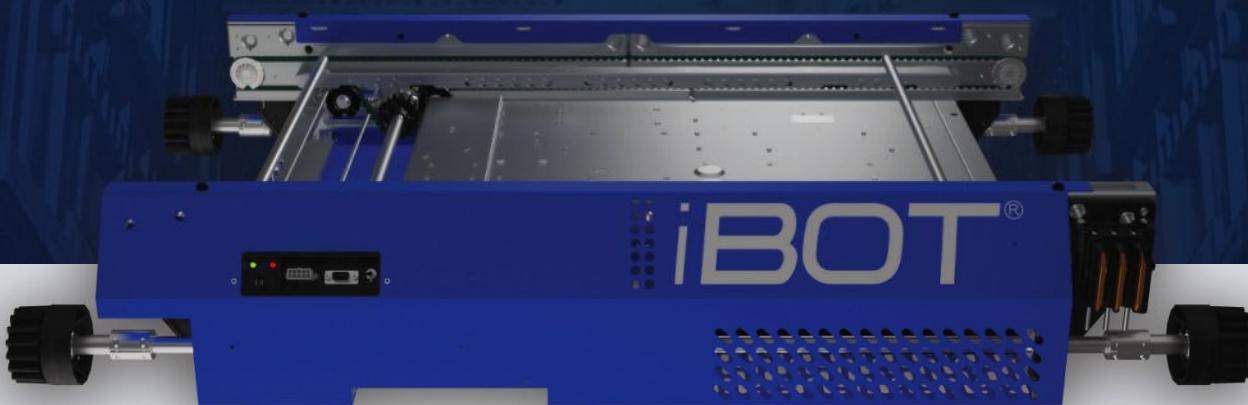
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Slow and steady wins the rates

Careful planning and incremental development are the surest way to ensure fleet management initiatives produce the desired results.

By **Josh Bond**, Senior Editor

With several years of practice under its belt, the lift truck community has settled on some general best practices for the adoption and refinement of fleet management technologies. All the same, the process remains a deeply unique one for each fleet, requiring an integration of technology and culture. Collin Rush, general manager of InfoLink customer support for Crown Equipment, recommends approaching the challenge incrementally, but holistically.

"My advice to someone on their first day with fleet management is that they really need to think about best practices and start small with things like access control, compliance and inspection checklists," Rush says. "To be successful, you have to have standard operating procedures in place and make sure managers enforce them."

Rush encounters customers at all stages of the telematics journey. At the introductory level, customers tend to pursue data around a specific application and look for what an out-of-the-box package can provide. As they work to get more out of it, they look at analytics. Many don't have business intelligence tools in-house, so they lean on their dealer. Then, more sophisticated large retailers just need the data and will do their own analytics. A fourth category consists of customers who don't want to manage forklifts at all.

Crown offers an optional program that can benefit customers at all stages. A pre-go-live meeting introduces them to best practices to ensure they hit the ground running when they flip the switch. This is the time to upload operator credentials and set rules like the response to forklift impacts of various severity. A post-go-live meeting includes a system check and any coaching needed to get back on track, followed by a 90-day business review.

"Ninety percent are focused on compliance and access control," Rush says. "A year in, they start to be comfortable



with the system and want to get into productivity, utilization and energy management.

For example, one customer using a pallet truck with remote control functionality combined telematics data and warehouse management system data into their analytics. This allowed them to measure, for instance, the impact on pick rate if an operator uses the remote feature a certain percent of the time. They found that 50% to 60% remote control usage increased the overall pick rate by 12%. "Operators are the hottest commodity out there," Rush adds, "so that means they need to hire 12% fewer operators."

Proactive dispatch is becoming more popular and is one of the steps a dealer can handle. To use a telematics module, the operator needs a certification in the system. A lot of customers will certify all operators on the same day, Rush says. "A year later, if the customer forgets to re-certify, they wake up one day and nobody can operate a lift truck," he says. "Crown can monitor that, let them know these things are coming and help them prepare."

Rush reiterates the need for planning before implementing telematics. He's seen arguments between the safety group's concerns and the operations group's productivity goals. "Frankly, they have to work it out between themselves to come to agreement," he says. "It comes back to best practices, and the more you can establish up front, the less debate you have to have going forward." ■

Josh Bond is Modern's senior editor and can be reached at jbond@peerlessmedia.com

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The place of pallets in the world of sustainability

When Barron's named CHEP's parent company Brambles the most sustainable company globally, we wanted to hear more.

By Gary Forger, Contributing Editor

Sustainability is a tricky subject. There are just so many different ways to look at it. Not long ago, I did a story for *Modern* on sustainable packaging. It included reusable and recyclable plastic solutions and single use, recyclable paper and cardboard solutions. At least one supplier of the latter didn't think anything of the former should be included in the article because it was plastic and by (their) definition was not sustainable. Yes, but...

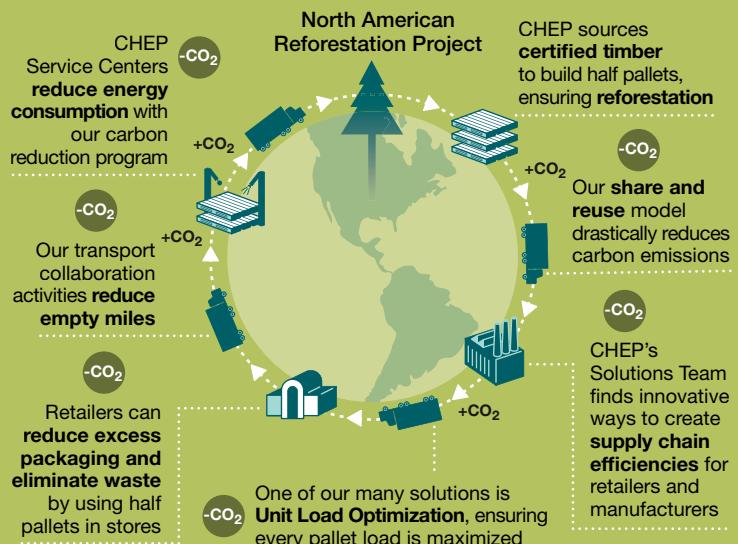
And, we all know the story that certain municipalities mix together recyclables and garbage and landfill it all. Nothing gets recycled even though many thoughtful people took the time and effort to separate the two.

That said, we all agree that sustainability is worth pursuing. In February, Dow Jones' Barron's publication named Brambles the most sustainable company globally. That's quite a distinction for the parent company of CHEP, pallet supplier to 59 countries.

"The pallet is an enabler," explains Jason Adlam, vice president of business development at CHEP USA. Ask him to expand and Adlam says wooden pallets are both sustainable and reduce cost. They're sustainable because they can be reused and recycled. In CHEP's case, the pallets are part of a circular business model called pooling, which continuously moves pallets through the supply chain again and again and again. Furthermore, these pallets reduce cost because they increase shipping efficien-

Bringing sustainability full circle— The carbon neutral half pallet

All of these efforts reduce carbon, the remaining emissions are now offset, creating a **carbon neutral platform**



Source: CHEP

cies and minimize waste.

"That's a double win. And, people's understanding of this has accelerated in the past couple of years," he continues. But, there's more.

While CHEP has more than 110 million pooled pallets and containers in North America, it has most specifically a line of pooled half pallets that are carbon neutral. The illustration (above) details how a pallet is carbon neutral.

Half pallets not only simplify shipping, but are suitable for in-store display and are retail ready when they arrive. You've probably seen them at the grocery store, but may

not have realized their importance.

One example is Jel-Sert's Otter Pops popsicles on store-ready pallets. These 40 x 24-inch half-pallets weren't Jel-Sert's first choice, says Adlam. Instead, the company started with full size (48 x 40 inch) pallets. However, the size of the packages didn't fit well on the full pallets and they often arrived damaged. The product fit much better on the half pallets, he adds.

There's another benefit, too. Just Jel-Sert's use of these half pallets for Otter Pops and other products will save 230,000 pounds of CO₂ emissions annually. Impressive.

In fact, CHEP has a program called Zero Waste World. The idea is threefold: solve packaging challenges, reduce empty transport miles of empty over-the-road trucks, and reduce process inefficiency.

Progress is already being made. The Jel-Sert solution is just one example of the first goal. Meanwhile, the target, says Adlam, is to outright eliminate many empty truckloads a year. As to improved process efficiency, an



increase of just 4% to 6% in product visibility alone would save \$1.9 trillion globally, he says citing a study by Cisco.

When you hear numbers like these, who knows how big this sustainability thing could be. ■

Gary Forger is a contributing editor with Modern and can be reached at gforger@gmail.com.

A photograph of the G20 ZPA Motor Control Module. It is a black rectangular device with several ports and cables attached. On the left side, there are two black connectors. On the right side, there are two more black connectors and some smaller wires. The module itself has a few small labels and a 'CE' mark.

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Editor's note: This story on Varner's automated retail distribution center in Vänersborg, Sweden, is a continuation of our look at global order fulfillment, and our second set in Scandinavia.

Building the world's best warehouse

That was the goal of Scandinavian retailer Varner. The result is a most highly automated, omni-channel retail distribution center, that is also flexible, cost-effective, ergonomic and sustainable.

BY BOB TREBILCOCK, EXECUTIVE EDITOR

“From the start of the project, we declared that we wanted to build the best warehouse in the world.” So says Anders Eriksson, the supply chain director for Varner AS, one of Scandinavia’s largest retailers. Eriksson oversaw the design and implementation of a new 500,000-square-foot, omni-channel distribution center in Vänersborg, Sweden. “Of course, it’s impossible to know or measure if it is the best warehouse in the world,” he adds, “but it was important for us to challenge ourselves and our partner.”

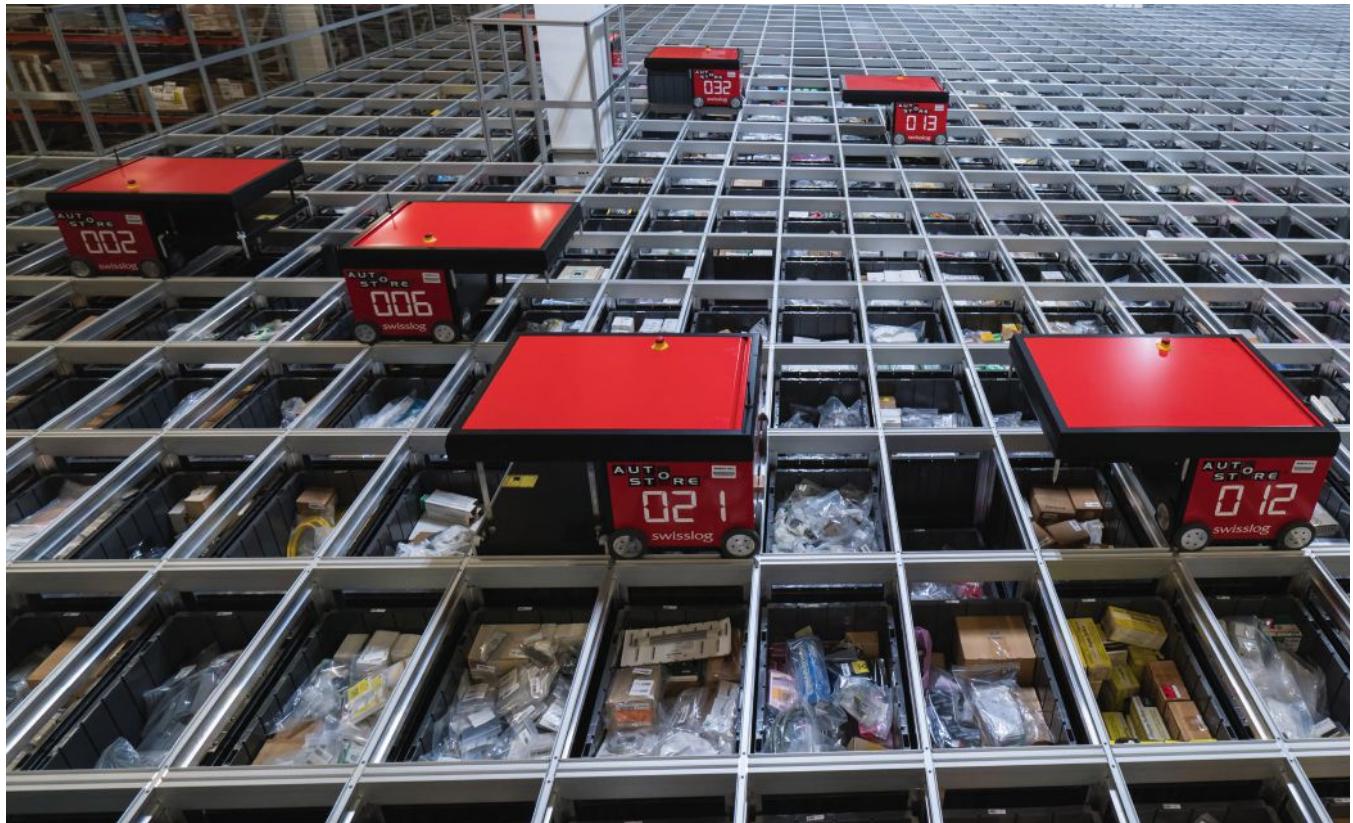
Did they succeed? As Eriksson notes, it’s tough to say. But the final design, developed in conjunction with a system integrator (Swisslog, swisslog.com), is one of the most highly automated and flexible retail distribution centers we have come across at *Modern*. The facility can handle the store replenishment needs

of 10 unique retail chains, each with its own go-to-market strategy, along with a fast-growing e-commerce business. The materials handling systems address robotic palletizing and depalletizing, automated pallet storage, automated case storage, automated garment-on-hanger (GOH) storage and robotic goods-to-person piece picking. What’s more, it was designed not only with growth in mind, but also to be ergonomic and sustainable.

The solution features a representation of most of the tools from the materials handling tool box, including:

- A cross-belt sortation system capable of handling 6,000 cases per hour.
- A seven-crane pallet handling automated storage and retrieval system (AS/RS) with 48,000 pallet locations.
- A 22-crane case handling mini-

Photos courtesy of Swisslog



The primary picking engine for e-commerce and store replenishment orders is a goods-to-person robotic solution like this one. The facility also features a garment-on-hanger area (not shown).

load AS/RS with space to store approximately 500,000 cartons.

- An AutoStore goods-to-person picking system, currently being expanded to 12 decanting stations, with 224 robots and the capacity to store 116,300 bins serving 24 pick stations.
- A three-level garment-on-hanger storage and pick mezzanine.
- Automated palletizing and depalletizing.
- Automated packaging and bagging.

Eriksson's take on the facility: "We have a state-of-the-art facility and a supply chain organization that is well equipped, highly competent and prepared for the future."

Taking control

In 1962, Frank Varner, a budding Norwegian retailer, opened his first store on

Thorvald Meyersgate in Grünerløkka, Oslo. Named for the founder, the Frank Varner store became a huge success. Three years later, Varner opened another store in Oslo and one in nearby Trondheim. In 1967, Varner coined the name Dressmann in connection with another new store opening in Oslo. In the ensuing years, Dressmann stores opened at a record pace across Norway.

Today, Varner is a family-owned, value-driven fashion retailer and one of the largest fashion retailers in Scandinavia, with an estimated \$1.2 billion U.S. in revenue in 2018. The company describes itself as "a progressive workplace... [that thrives] on innovative business development with the customer in constant focus" and adds that through its innovative omni-channel retailing strategy, its goal "is to become the leading data and tech-driven fashion com-

pany in Scandinavia."

With nearly 11,000 employees and 1,400 stores across seven countries, Varner has 10 retail chains operating under their own unique brands, including Cubus, Dressmann, Dressmann XL, Bik Bok, Carlings, Volt, Urban, WOW, Levi's Store, Nike Store and Days Like This. While the majority of the stores are located in Norway, Sweden and Finland, Varner also operates stores in Iceland, Denmark, Austria and Germany. All of the stores and e-commerce customers are supplied from the central logistics center in Vänersborg.

Planning for the new facility began in 2013. Prior to that, each of the retail chains operated their own distribution networks independent of each other. These operated from 10 different manual warehouses in Northern Europe, all

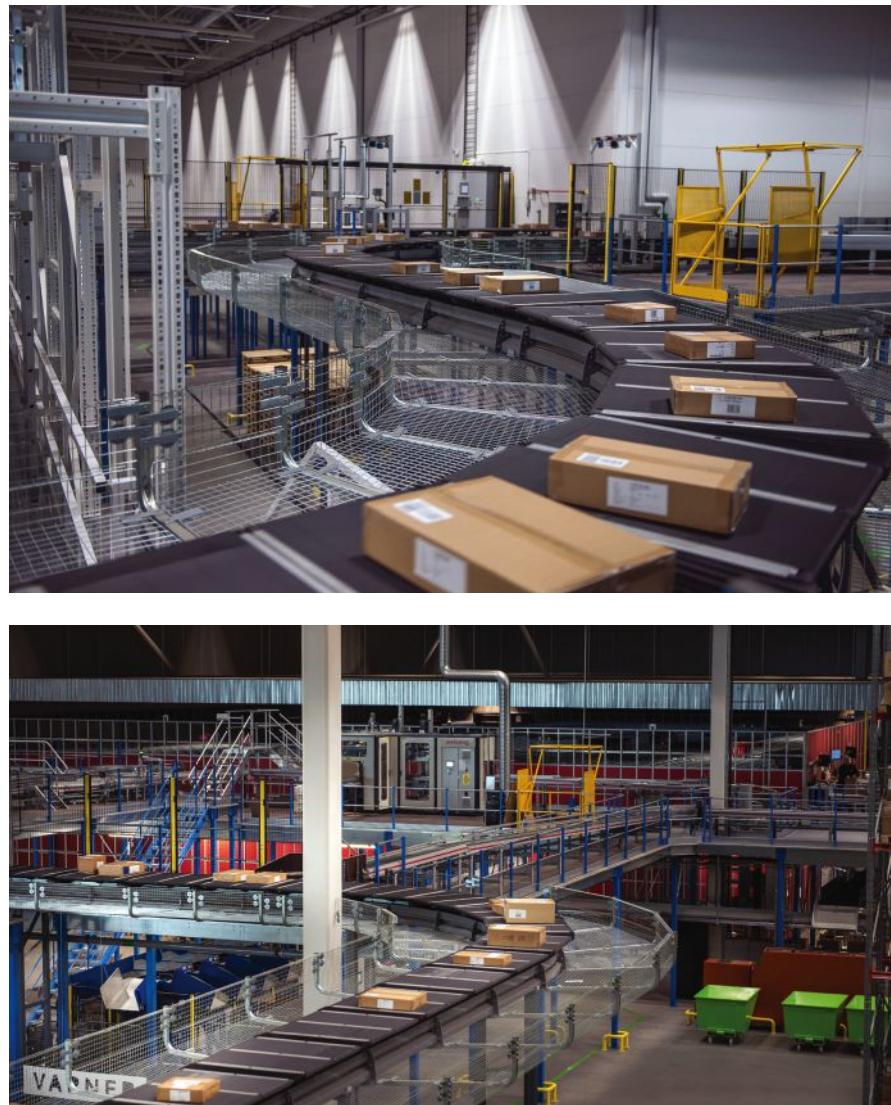
operated by 3PLs. While the supply chain had evolved over the years, it had become too complex and inefficient to address Varner's changing needs. What's more, Varner did not have the level of control it wanted over its supply chain.

"Fashion retailing is a highly competitive business, so you have to constantly cut costs and improve your quality and control in the supply chain," Eriksson notes. The idea, then, for the new facility was to bring all of Varner's distribution, including e-commerce order fulfillment, under one centrally located roof that would enable efficient last-mile delivery and cut lead times for smaller and more frequent store deliveries, resulting in less back stock in the stores.

"When we decided to centralize all of our products into one warehouse, the main driver was to become more efficient and minimize our store stock," Eriksson says. All of those factors pointed toward automation, as did the tight labor market in Norway and Sweden.

In addition to design questions, the retailer needed a central location to serve all of its growing markets. "We did a center of gravity analysis, and it became clear that the warehouse should be located somewhere in the western part of Sweden, near the harbor of Gothenburg, but still close to Norway, where the company is headquartered," says Eriksson. In Vänersborg, the company not only found the proximity to the port and its markets, but also a lot of suitable land was available for the warehouse and an additional lot for future expansion if needed.

Varner worked with its systems engineer partner for nearly two years to conduct a conceptual study, design the solution and select the partner for the project. Swisslog, which conducted the original study and design process on a consulting basis before winning

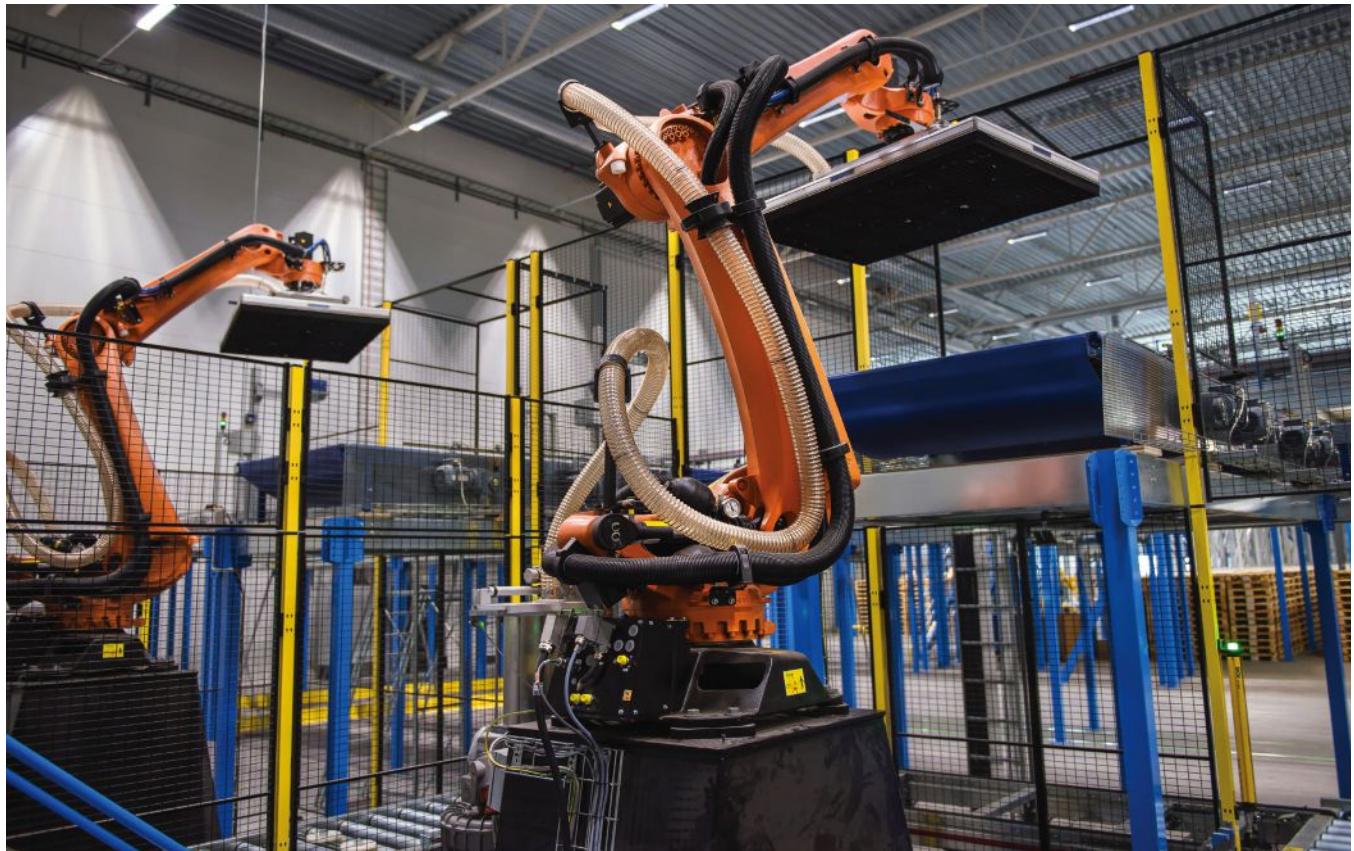


A conveyor and cross-belt sortation system that begins in receiving routes product to the different automated storage, picking and packing areas.

the contract, notes that it devoted some 8,000 hours developing three different concepts before it was selected as the implementation partner. The build and implementation phase got underway in the middle of 2014 and was completed mid-2016. The robotic goods-to-person picking area is currently under expansion, growing from 60,000 bins to 115,000 bins to meet the growing e-commerce channel as well as more strategic store replenishment.

"Part of our company culture is to be

very involved with our partners during the development phase, and the warehouse project was no exception," says Eriksson. "We participated actively and learned a lot about warehouse automation. We felt comfortable that we had chosen a great solution." He adds that during the course of the project, Varner made considerable changes to the way it replenishes its stores, and that the solution proved flexible enough to adapt to the changes along with the company's growth.



Robots palletize inbound cartons for storage in the high-bay AS/RS and depalletize cartons destined for a mini-load buffer storage area.

Automation by design

The new distribution center has been described as a “complete solution that handles today’s demands for omni-channel” and “supply chain operations on the customer’s terms, whether they buy in the store or online.”

It balances the need for speed and accuracy; handling goods at the pallet, carton, each and hanger levels; and to minimize labor given the low employment rates and relatively high wages in Norway and Sweden. Receiving, palletizing and depalletizing, storage, picking and packing, and labeling have been automated to the extent possible. For that reason, the facility is able to operate with 80 to 100 employees—a relatively low number given the size of the facility and the number of cartons handled per hour.

There are five areas of automation:

1. A cross-belt sortation area near receiving;

2. Robots palletize and depalletize cartons depending on where they are needed next;

3. Buffer storage at the pallet level and case-level storage are automated;

4. A robotic goods-to-person picking area further breaks down cartons into unit level totes for piece picking; and

5. Garments that are handled on hangers are processed in the three-level pick module.

The cross-belt sorter is essentially the traffic director for the facility, making sure cartons get to the right area in the facility based on where they’re most needed, from crossdocking inbound merchandise to an outbound truck to replenishing the robotic goods-to-person picking area.

The mini-load, which is automatically replenished by the pallet warehouse,

is the main engine for carton flow—it brings cartons out of storage on an as-needed basis and sends them to the area where there is demand. That could be a full carton that goes to shipping or a carton that will be decanted into a tote to replenish the robotic goods-to-person picking area.

The robotic goods-to-person picking area creates single and multi-line orders for e-commerce fulfillment as well as mixed SKU cases for store replenishment. Once a shipping carton or e-commerce package is complete, the items are sorted by the cross-belt or a bag sorter to the right area.

And, the garment-in-hanger area combines automated storage with conventional picking in a three-level pick module for items that aren’t handled in cartons or totes.

MOUNTS BUILT AS RUGGED AS THE ENVIRONMENT THEY WORK IN



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While Varner operates the facility, the retailer has outsourced monitoring and maintenance to Swisslog.

The additional data, as well as the quality of the data, collected by the automated system has been a bonus benefit. "We improved the quality of our logistics data and we have a better understanding of the importance of data quality" as a result, Eriksson notes.

While Varner employees are responsible for the warehouse operations, the retailer has outsourced maintenance of the automation and the warehouse management and control systems to Swisslog. "We are still in charge of the logistics center, but seven technicians from Swisslog work full-time in maintenance and their IT specialists support the warehouse management system," Eriksson explains. Swisslog is also responsible for training associates when needed. The reason is that "we don't gain

any economies of scale doing service and maintenance with our own staff, so it was an easy decision to outsource those functions," he says.

The facility has been running for four years, with a major expansion of the goods-to-person picking area underway. Whether it's the best retail DC in the world may be difficult to answer, but for one of Northern Europe's leading retailers, it is "a world-class facility that we use as a precision tool for inventory management to deliver the correct items to our stores, when they need them," Eriksson says. "And, we have the warehouse capacity we need for the foreseeable future. We no longer talk about the limitations of our supply chain, just about how well everything runs." ■

Automating fashion distribution

The 500,000-square-foot distribution center in Sweden handles fast-fashion store replenishment and e-commerce fulfillment in a highly automated setting.

Varner's distribution center was centrally located in Sweden for access to ports and the retailer's network of stores and customers across seven European countries. Processes were designed to manage pallets, cartons and item-level units and piece picking for e-commerce fulfillment and garments on hanger.

The facility is divided into several processing areas.

High-bay AS/RS: The high-bay area provides bulk buffer storage for 50,000 pallets. The product stored here represents a limited number of SKUs purchased in large quantities for one of Varner's value chains and stored at the pallet level. When floor-loaded contain-

ers arrive at receiving (1) from the port, cartons are unloaded onto extendable conveyor (2) and transported to a cross-belt sortation area (3). The cartons are sorted by SKU to a robotic palletizer (4). Pallets are automatically stretch wrapped and then conveyed to the automated storage and retrieval system (AS/RS) (5) for temporary storage.

When product is retrieved from the AS/RS, it's conveyed to a manual processing area where the stretch-wrap is removed. The pallets are then automatically depalletized and the cartons are conveyed to the mini-load storage system (6), which is the facility's main order fulfillment engine for store replenishment.

Carton receiving: The carton receiv-

Varner,
Vänersborg, Sweden

SIZE: 500,000 square feet
ITEMS: Owns 10 retail chains. Fashion retail.
SKUS: 50,000
SHIFTS PER DAY/DAYS PER WEEK:
2 shifts, 6 days

ing area can sort 6,000 cartons per hour. Cartons for which there is immediate demand are crossdocked to shipping (7) into an outgoing truck for store delivery.

Mini-load system: Cartons destined for storage are conveyed to a mini-load storage area (6) serviced by 22 cranes and with storage capacity for 500,000 cartons. The mini-load serves as the primary carton order fulfillment system for the facility. When Varner's enterprise resource planning (ERP) system assembles orders, they are sent to the warehouse management system (WMS). Cartons are then retrieved from the

mini-load and sent either to the shipping area, where they are loaded onto a truck, or to the robotic goods-to-person picking area (8).

Robotic goods-to-person picking:

Cartons destined for the goods-to-person picking area may come directly from receiving or from the mini-load system. Cartons go first to a decant area (9), where the contents are emptied into a tote and conveyed to the upper level for storage and handling by the robots. Where there is demand for product, the robots remove a tote from storage and send them to one of the workstations. All stations can fill e-commerce orders and orders for mixed SKU cartons for store replenishment. Items for store replenishment are picked into a corrugated container. Once all of the items for that container have been picked, a lid is automatically added, the box is labeled and then conveyed and sorted into an outbound truck. Items for e-commerce orders are put into one of 40 different polybags. Finished bags are then conveyed to a bag sorter and sorted into a roller cage.

Garment-on-hanger (GOH) area: Some incoming cartons are sorted directly to the GOH area (10). There, they are decanted onto hangers that are inducted onto the GOH system. The area serves a three-level pick module. Associates are directed by voice to pick items. Those items are placed on a central conveyor line, delivered to a labeling area and then loaded onto trucks. ■

System suppliers

SYSTEM DESIGN, INTEGRATION & GENERAL CONTRACTOR; LIGHT GOODS & PALLET CONVEYOR SYSTEMS; MINI-LOAD AS/RS, PALLET-HANDLING AS/RS, WMS, WCS & WES: Swisslog

CROSS-BELT SORTATION: Beumer

ROBOTIC GOODS-TO-PERSON PICKING: AutoStore

ROBOTIC DEPALLETIZING: Kuka Robotics

ROBOTIC PALLETIZING: Qimrox

AUTOMATIC CARTON ERECTION & CLOSING: Jomet

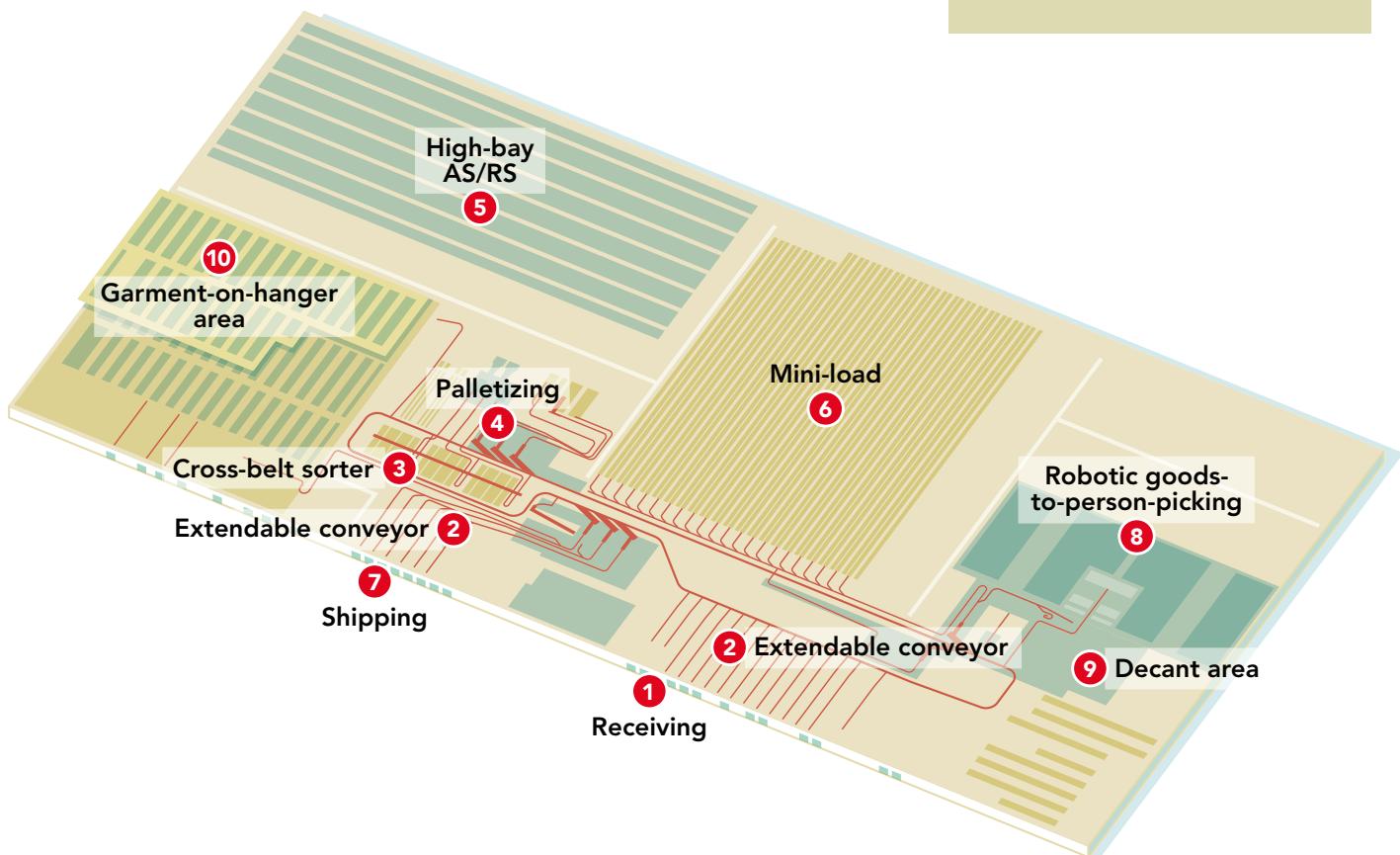
E-COMMERCE BAG SORTATION: Qubica

MINI-LOAD RACK SYSTEM: Bito Storage Solutions

PALLET RACKING: Stow

ORDER RELEASE MODULE FOR SORTING INCOMING CASES: Dynamic Logistic Systems

TELESCOPING CONVEYORS FOR LOADING AND UNLOADING: Caljan



2020 Warehouse/DC Equipment Survey: Making the right moves to offset pressures

The percentage of respondents “holding off” on investments dropped modestly, and the overall spending outlook remains steady. The survey’s big picture has respondents staying close to the high bar for spending set in recent years, while layering in select investments to help solve for top challenges like tighter cycle times, additional customer requirements and the need to maximize available workforce.

BY ROBERTO MICHEL, EDITOR AT LARGE

In some ways, 2020’s “Annual Warehouse and Distribution Center (DC) Equipment Survey” points to a bit of a plateau in spending on equipment and systems. However, that plateau comes after years of healthy investments in distribution centers.

Budgets aren’t skyrocketing, but

respondents are well aware of the need to continue to invest to be able to address pressures like tighter cycle times and a scarce labor pool. With many smaller companies in the respondent mix, investment in traditional equipment remains strong, even though there are positives in the survey for

newer technologies like robotics.

Norm Saenz, managing director with St. Onge, a supply chain engineering and consulting company that works in partnership with *Modern Materials Handling* on the study results, believes that the survey shows many positives, but also reflects the reality that many organizations need to layer in some traditional equipment, systems and processes before rushing into technologies like mobile robots, drones or artificial intelligence (AI) applications.

“The future is bright, with the availability of some great technologies for organizations, but the application must fit the particular needs, budget and operational readiness of a business for investments to be successful,” says Saenz.

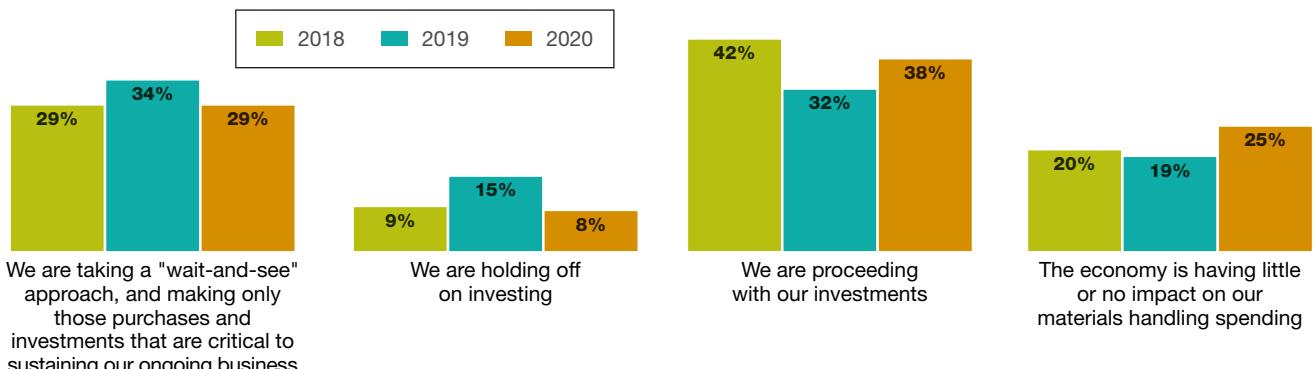
Peerless Research Group’s (PRG) annual survey was conducted in Janu-

2020 respondent demographics

Peerless Research Group’s (PRG) e-mail survey questionnaire was sent to readers of *Modern Materials Handling* and *Logistics Management* in January of 2020 and early February of 2020, yielding 145 qualified respondents. The respondents were from sites whose primary activity is corporate headquarters (38%), warehouse/distribution (26%), manufacturing (24%), and warehousing

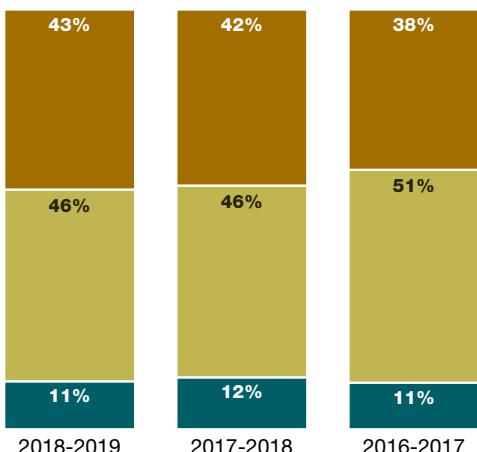
supporting manufacturing (10%). The median revenue of responding companies is \$58 million, while the average is \$268 million, compared with an average of \$324 last year, and a median of \$84. Qualified respondents—managers and personnel involved in the purchase decision process for materials handling solutions—hold influence over an average of 125,335 square feet of DC space.

How is the present state of the economy affecting your spending on materials handling equipment technologies services and solutions?

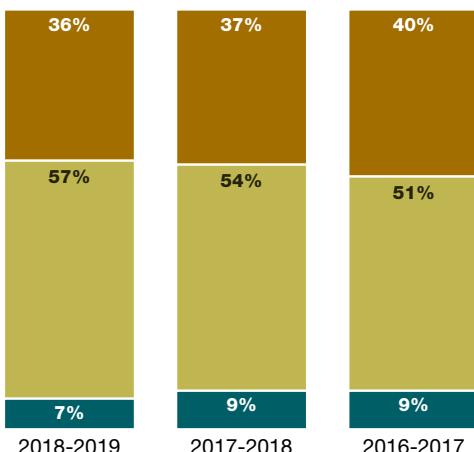


Source: Peerless Research Group (PRG)

How did your company's spending on materials handling solutions in 2019 compare with 2018? And, by what percentage?



How do you expect your company's spending on materials handling solutions in 2020 to compare with 2019? And, by what percentage?



■ Increase
■ Stay about the same
■ Decrease

ary and early February of 2020, before the supply chain concerns from coronavirus. Among the key spending findings was a drop in those saying they were "holding off" on investing given the state of the economy. This year, only 8% said they were holding off, compared to 15% last year.

Other 2020 highlights include:

- When asked how 2020 spending would compare to 2019, 36% expect an increase and 57% expect it to stay

level. This is a bit more cautious than last year, when 37% expected increased spending, and 54% said it would stay the same.

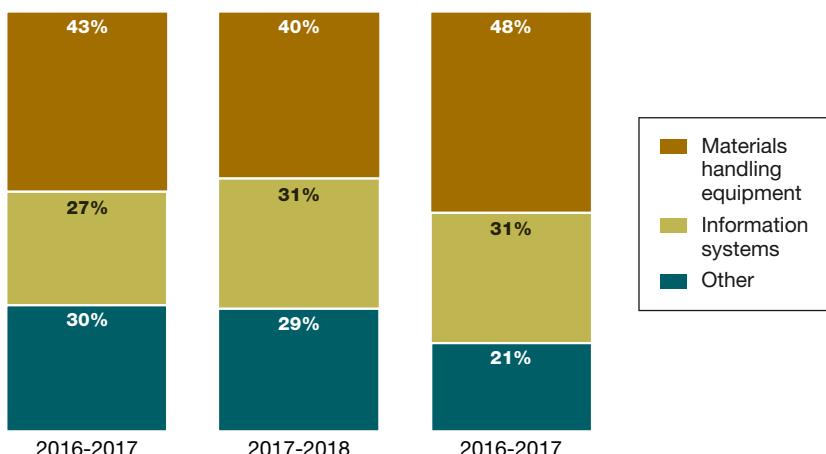
- When asked about spending expectations over the next two to three years, those foreseeing increased spending dipped, from 53% last year, to 48% this year.

- Spending indications on third-party logistics services stayed steady, even after last year's increased indica-

tions around 3PL services.

- Spending on some traditional equipment categories such as lift trucks and dock equipment stayed steady or grew, while several information systems (IS) categories saw declines. The answers related to robotics were less bullish than last year, but 9% said they currently use robotics, and 19% will consider them during the next 24 months.
- Respondents projected a growing

What percentage of your overall spending during the next 12 months will be on equipment, systems or other?



a point now when most managers have experience with warehouse systems and software, so there is more fundamental knowledge on how to use these systems. “Clearly, people in industry realize that pressures like faster turnaround time are only going to intensify, and that’s going to require a higher level of control over their operations,” he says.

Spend trends

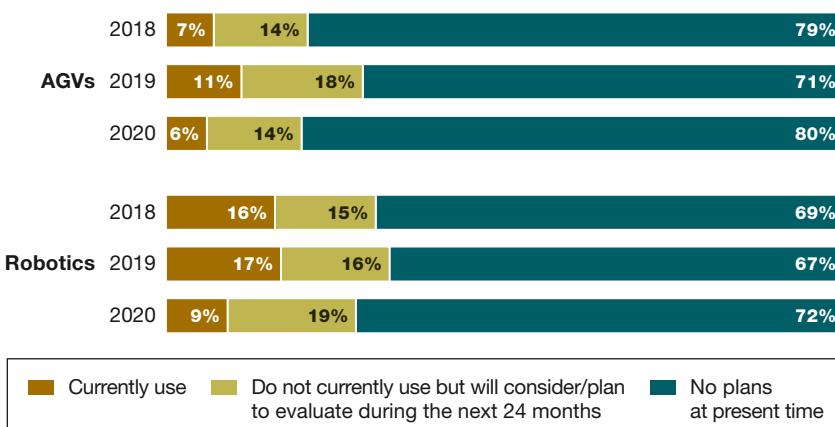
The 2020 survey showed the overall trend to be healthy, matching the positive spend outlooks of recent years, with some fluctuations. As stated previously, a smaller percentage is holding back on spending due to the state of the economy while 42% are proceeding with investments, up from 32% last year. Those taking a “wait-and-see approach” also declined, from 34% in 2019 to 29% this year.

For those “proceeding with investments,” the survey also asked “on what,” providing broad categories to choose from such as materials handling equipment, IS, conveyors and sortation, robotics, automatic guided vehicles (AGVs), and new this year, “other” as a category. Perhaps partly due to the “other” choice, only 50% indicated plans for IS apps, down from 58% in 2019. This question also found that 22% plan to spend on robotics, down from 40% last year, and nearly as high as the 24% indicating conveyors and sortation.

When asked how spending for the year that just ended (2019) compared to the previous year, 43% said it increased, up 1% from last year, while 46% said it stayed about the same as last year.

Looking to expectations for 2020 spending versus 2019, 36% expect an increase, whereas last year, 37% expected an increase. A majority (57%) expect this year’s spending to stay

Does your company currently use or are you considering automatic guided vehicles and/or robotics technologies for materials handling applications?



Source: Peerless Research Group (PRG)

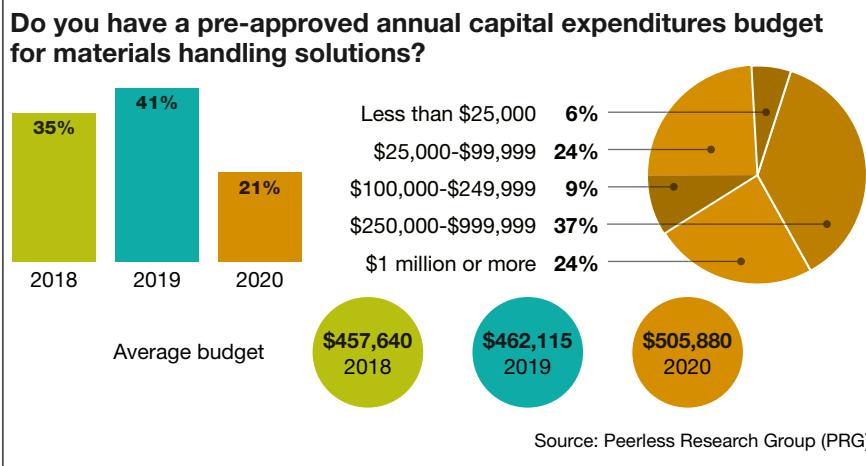
need to automate the measuring of cycle time performance. Respondents also foresee the need for more automation in the way they gauge issues such as on-time shipping and dock-to-stock cycle time.

Overall, the 2020 survey reflects an industry willing to keep up on spending and taking steps to meet ever-increasing fulfillment pressures.

“It’s a fairly cautious outlook, but

clearly, people are still going to spend money appropriate to their budgets and operational needs,” says Donald Derewecki, a senior consultant with St. Onge. “Another positive is that the cost of much of this functionality keeps coming down, making solutions more affordable for mid-sized or relatively small companies.”

According to Derewecki, we’re also at



about the same, a bit higher than last year's 54%. And for those expecting an increase or decrease, the survey examined by what percentage. This revealed that the median increase was 15%, while the median decrease was 30%.

Every year brings a new respondent mix, so dollar findings naturally fluctuate. That said, when asked to pick dollar ranges for total spending over the next 12 months, 5% said their company will spend \$2.5 million or more, with a total of 20% spending higher than \$500,000. Many respondents also had modest spending projections, with 43% at

\$99,000 or less.

Average anticipated spending over the next 12 months is \$355,175, down from \$400,00 in 2019, but higher than 2018's average. Median anticipated spending for 2020 is \$97,905, up slightly from \$82,435 last year. For 2020, 36% have an approved budget, and of these, 24% have a budget of \$1 million or more. The average budget reached \$505,880 this year.

"The respondents are generally optimistic on spending, as seen by the finding that just 8% will hold off on spending," says Derewecki.

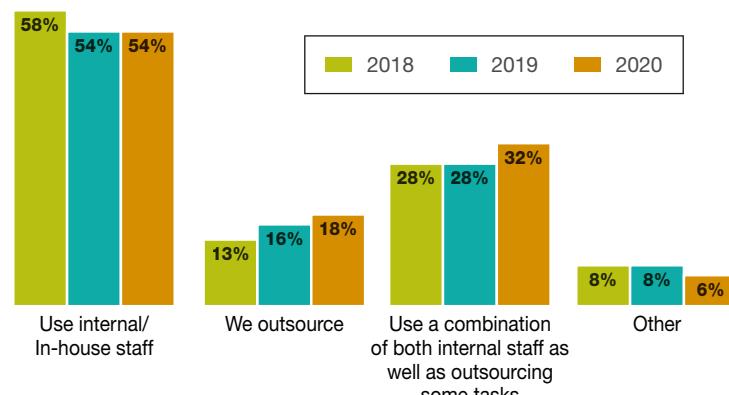
Investment trends

While the last few years have seen gains across various software and technology categories, this year, some of the IS categories declined, with the increases more frequently seen in equipment categories. Of course, in these days of smart, Cloud-connected assets, even traditional equipment can involve technology.

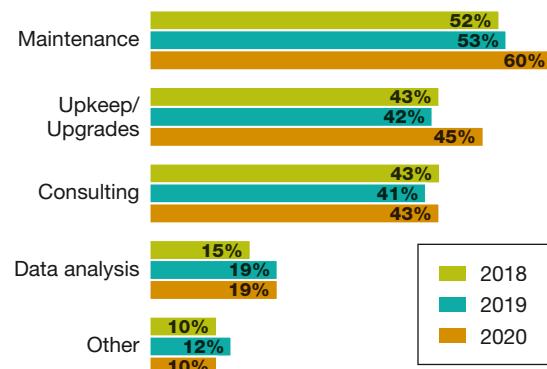
When asked what percentage of overall spending will be on either materials handling equipment, IS, or "other" over the next 12 months, 48% is for equipment, 31% on IS, and 21% on other. Last year, this breakdown was 40% on equipment, 31% on IS, and 29% on other.

Looking at projected 12-month spend for specific categories of equipment/systems, 27% said that they will invest in dock equipment, up from 24% last year. Percentages also bumped up for power transmission including motors, order picking & fulfillment equipment, and automated storage including carousels and vertical lift modules. Spending on lift trucks remained fairly steady, with 46% indicating plans, just 2% lower than

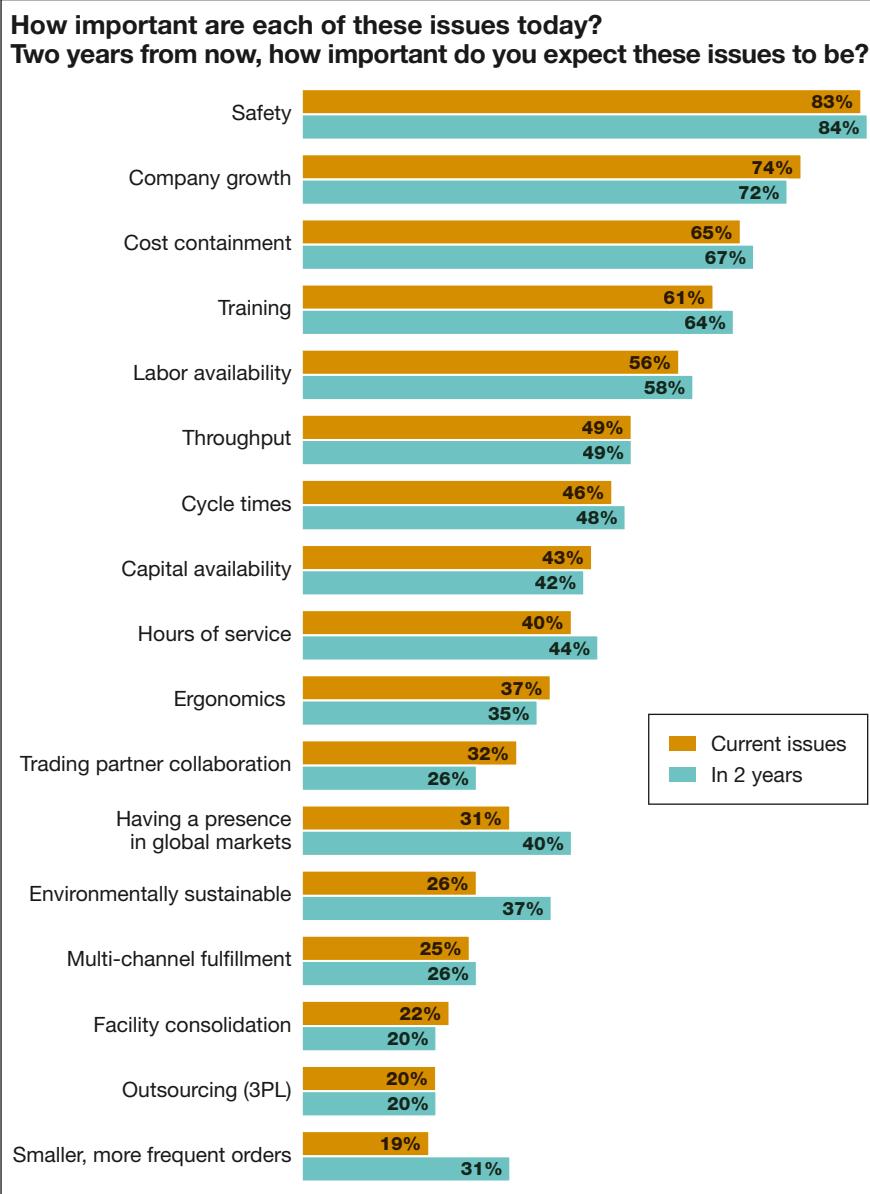
How are you currently maintaining your automated materials handling systems?



What role are your vendors and maintenance suppliers playing in maintaining your automated systems?



Source: Peerless Research Group (PRG)



from 29% last year.

Saenz notes that for many companies, investment in equipment categories like new lift trucks, dock equipment, or more basic IS areas like bar coding, can be logical improvements if they are coming from older equipment, legacy methods like paper-based pick lists or are expanding.

"There are still many companies that have to make some moves into the more traditional equipment and systems categories—things that have been around for many years—but will help them gain efficiencies and deal with issues like the labor shortage," says Saenz. "Even the companies forging ahead with the more advanced solutions have to continually evaluate whether they have the right item master data, material flow and processes in place so that when they do layer in the newer technology, it can be effective."

Robotic & mobile tech

Even though many respondents weren't from big operations with large budgets, the findings on robots reflect significant activity. For 2020, 9% currently use robotics, down from 17% last year, but 19% are evaluating robotics, up 3% from last year. Additionally, in a separate question that asked those respondents moving ahead with investments in which categories they shall consider, 22% said robotics.

The survey also asked about applications for robotics. Growth applications included packaging (up by 2%), transportation of goods within DCs (up to 18% versus 7% last year), and truck unloading, up by 4%. Palletizing and pick and place remain the two most frequently cited applications for robotics. Mobile autonomous pick to cart held steady at 21%.

last year. Additionally, 16% say they plan to use 3PLs, same as last year.

For projected 12-month spend on IS, several categories were down slightly. One exception is asset management systems, with 26% indicating plans, up from 20% last. Those saying they would spend on transportation management system (TMS) software also stayed level, and 12% have warehouse execution system

(WES) plans, down 1% from 2019's 13%.

When respondents were asked about broad areas of spending over the next 18 months, most areas were down, with the exception of maintenance services—up 5% to 42%—as well as outsourcing/3PL services, which stayed steady at 13%. This year, only 20% checked enterprise applications as a category for investments over the next 18 months, down



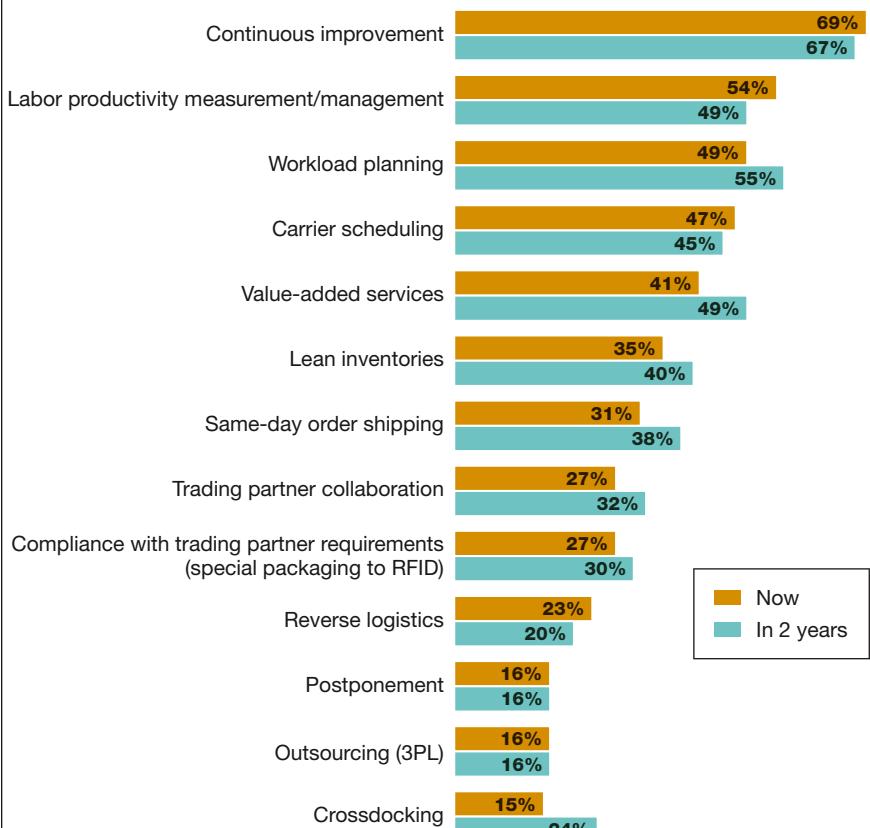
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Source: Peerless Research Group (PRG)

The survey also asked about AGV use and applications. AGV use was at 6% this year, with 14% evaluating. This was down compared to 2019, but nearly identical to the AGV use level from 2018. Uses for AGVs on the rise included palletizing (up 4%), depalletizing (up 8%) and packaging, up by 8%.

"The survey has some positive findings on robotics," Derewecki says. "When you consider the respondent mix, it can be seen as fairly strong uptake level."

When it comes to mobile technologies, 55% either use or have plans for mobile solutions of some type, up from 52% last year. When asked for

current use of and plans for specific types of devices, 53% currently use bar code scanners, and 43% plan to deploy bar code scanners during the next 12 months.

Smart phones and tablets were reported in use by 73%, but only 53% had plans for more during the coming 12 months. One mobile technology forecasted for increased deployment is global positioning system (GPS) technology—in use by 18% currently, but with 28% planning to deploy within 12 months.

The survey's findings regarding equipment maintenance showed an increase in outsourcing. This year,

18% said they outsource maintenance of automated systems, up 2% from last year. Additionally, 32% use a combination of internal staff as well as outsourcing for some tasks. Given the increasing level of software and specialized knowledge with today's automation, this slight uptick is not surprising.

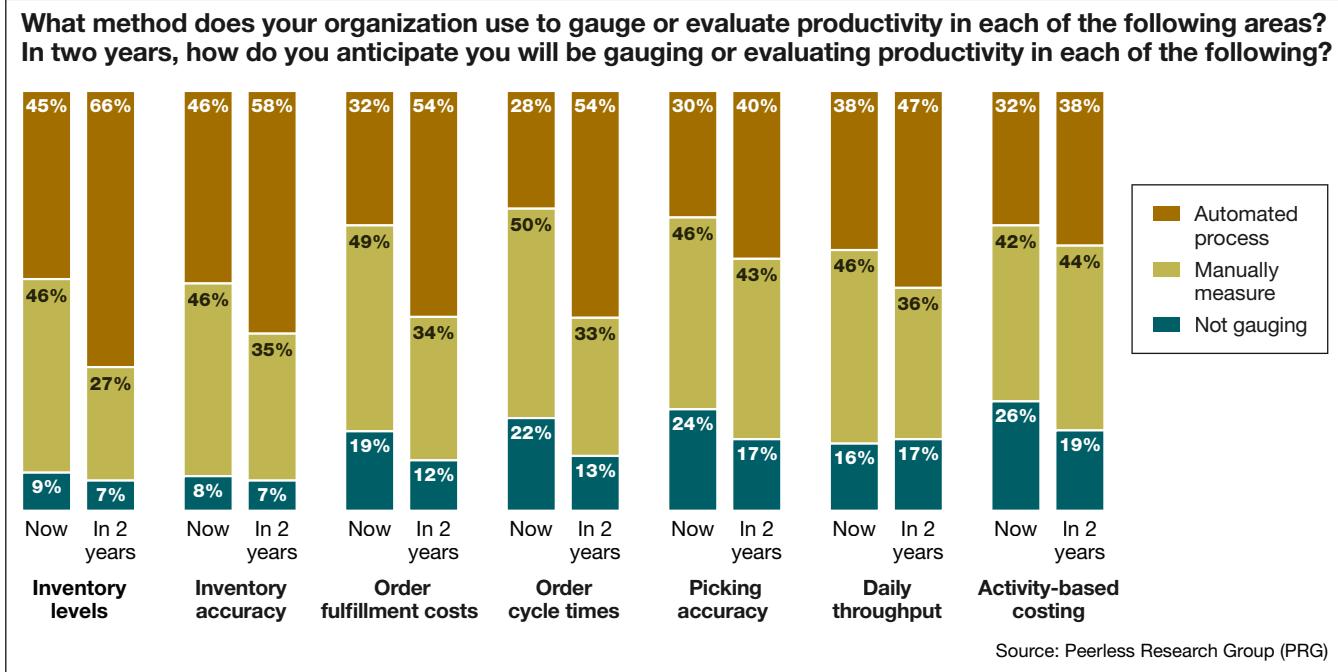
E-commerce trends

When asked for the most common method of fulfilling online orders today, and what the most common method would be in two years, 23% said filling online orders from DCs was currently the most common method, rising to 26% in two years.

Buy online and ship to customer from a store is the most common method for 13% today, rising to 18% in two years. Buy online, ship to customer from vendor is the most common method for 14% today, and rises to 18% in two years. The buy online, pick up in store (BOPIS) method is the most common for just 3% of respondents, with 4% foreseeing BOPIS as the most common in two years.

The survey also asked if e-commerce activity will or is already prompting change in where distribution and manufacturing activities take place. This year, 46% said e-commerce is prompting more distribution functions in manufacturing, up from 42% last year. Meanwhile, 36% said they will perform more manufacturing functions in distribution sites, down from 41% in 2019.

When asked "where does your packaging and fulfillment occur," the most commonly cited place is a warehouse. This year, 49% said packaging and fulfillment occur at a warehouse, up from 46% last year. Additionally, 20% said



packaging and fulfillment take place at a “fulfillment center,” compared to 15% last year, while 17% said that these processes take place in a DC, down from 25% last year. Another 32% said these processes occur in a manufacturing site, down from 37% in 2019. Finally, 9% said these processes occur in retail stores, up from 7% last year.

Pressures related to e-commerce such as tighter delivery windows and the labor crunch are reflected in the survey. When asked about the most important issues affecting DCs today and also two years from now, traditional concerns such as safety, growth and cost containment remain the leading areas, but labor availability also is a top concern. Today, 56% said that labor availability is a very important issue, with this rising to 58% in two years. Cycle times also rises by 2% in two years. Smaller, more frequent orders is rated as very important by 19% today, but this rises to 31% in two years.

When it comes to DC best prac-

tices now versus in two years, the top three practices seen as highly important today are continuous improvement, labor productivity management and workload planning. A bit surprisingly, respondents see labor productivity management as declining in importance two years from now (from 54% today to 49% in two years), though workload planning increases from 49% today to 55% in two years.

Other best practices seen as growing in importance in two years include value-added services, same-day order shipping, and crossdocking. “These results are consistent with what we see among our clients, particularly the growing interest in workload planning and value-added services,” says Derewecki. “Labor availability is a highly important concern for the companies we work with, and it’s surprising to me that it isn’t ranked a bit higher. Of course, if you’re concerned about workload planning, you’re concerned how many people you need to run your operation.”

Respondents are also interested in more fully automating the way they gauge the performance of key processes. The survey found only 28% have automated measurement of order cycle time, but 54% expect to have this automated in two years. Another 32% automate the evaluation of order fulfillment costs today, but 54% anticipate automating this in two years.

Similarly, dock-to-stock time is gauged in an automated way by only 18% today, but this increases to 35% in two years. Today, 42% have automated on-time shipping performance visibility. This rises to an anticipated 59% in two years.

Moves to improve

As the survey closed before coronavirus escalated, and North America had a mild winter, supply chain risk concern was muted. This year, 52% said they had a plan for identifying and mitigating risk, down from last year’s 54%, but ahead of the 45% who had

such a program in 2018.

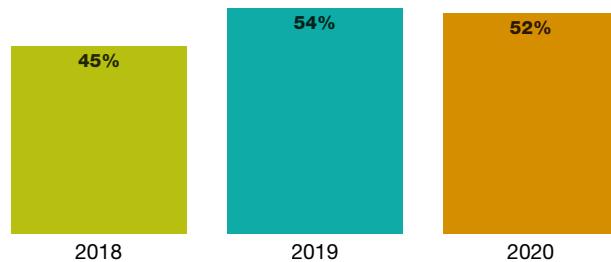
The top three risks being planned for were in-house production or operations risks (60%); logistics risks (57%) and supplier risks (47%). Last year, the percentages were higher for logistics risk (69%) and supplier risks (62%). Economic and financial volatility as a risk factor declined from 34% last year to 30% this year, equal to its 2018 level.

With the many operational challenges and logistics risks that organizations face, finding a path to improved performance seems daunting. Some challenges, like the extremely tight labor market or global trade disruption can't be controlled, only mitigated. The right approach to dealing with these pressures, agree Saenz and Derewecki, is continuous improvement and figuring out which of an operation's systems and processes need improvement.

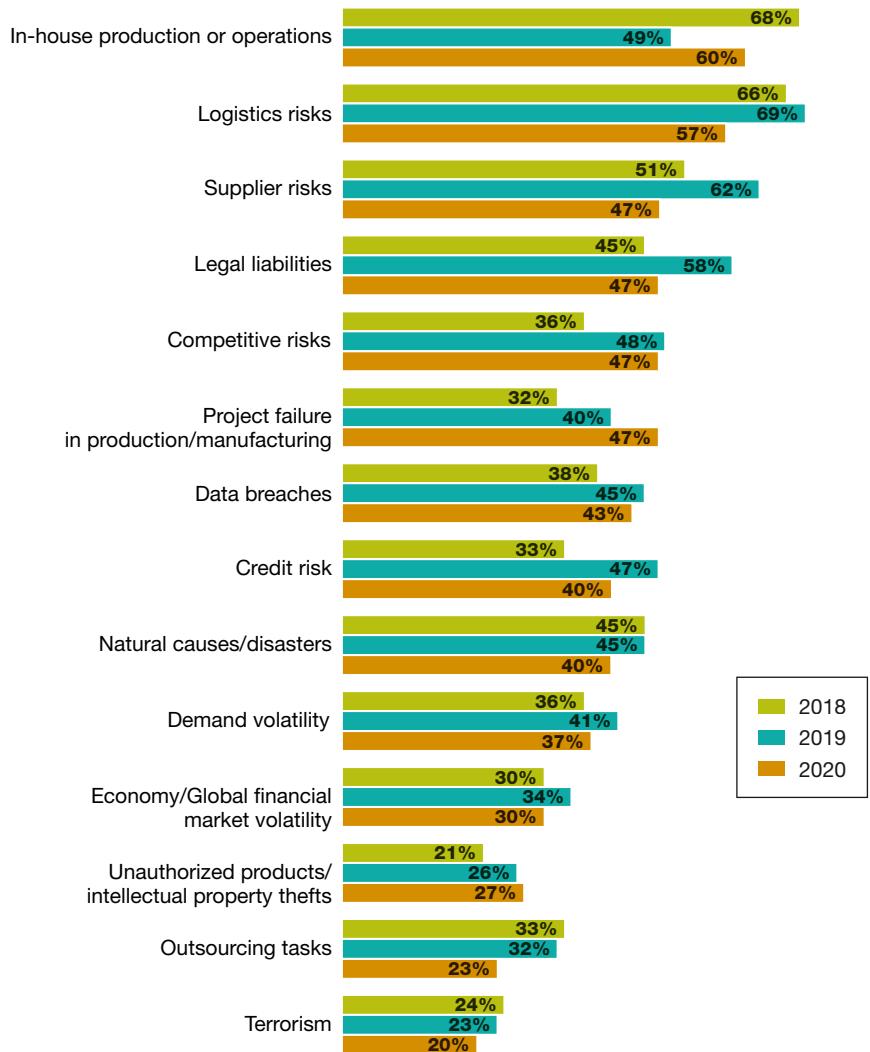
As Saenz explains, the right mix of investments varies not only according to budgetary constraints, but how solid an organization is on fundamentals, which can include aspects like having a good material flow, or having accurate item master data in their systems for details like the cubic volume of goods. These foundational elements should come before the shiny, new technologies, Saenz advises.

"Some of the traditional equipment investments can seem boring, but they can be the saving grace for an operation," adds Saenz. "It's all about continuous improvement and managers making the right decisions for their business. You have to walk before you can sprint, and find your way to the right mix of investments for your operation."

Do you have a plan for identifying, analyzing and reducing or eliminating exposures to risks in your materials handling, transportation and/or logistics operations?



In which areas?



Source: Peerless Research Group (PRG)

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MODEX IN REVIEW

With more than 900 exhibitors, 150 informational seminars, and 370,000 square feet of expo space, Modex 2020 focused on best-in-class solutions for manufacturing and supply chain operations. The coronavirus outbreak impacted attendance, but there was a steady stream of attendees across the four-day event. Show sponsor MHI is looking ahead to a record-breaking ProMat 2021—the industry's premier supply chain event. ProMat will be held at McCormick Place in Chicago, April 12-15, 2021.

MHS launches new software, predictive maintenance solutions for warehouses

MHS launched a new warehouse software solution built to address the challenges distribution and fulfillment centers face as a result of e-commerce growth. Comprising template-based modules for equipment control, inventory management and order fulfillment functions, MHS Helix works in customized configurations according to each facility's unique requirements.

"With DCs becoming increasingly complex, getting all the processes aligned using traditional warehouse software systems can result in runaway complexity, with several layers of software, redundancy and one-off customizations," said Tab Fischbach, senior vice president of business

development for distribution and fulfillment. "Our approach with Helix is to keep things simple, with ready-made modules that allow businesses to scale with new functionality while maintaining a single, lean platform."

The company also launched MHS Insights, a condition-based maintenance solution that monitors assets through IoT sensors and system data to provide timely maintenance recommendations and strategic health assessments.



Tab Fischbach, senior VP of business development for distribution and fulfillment at MHS, explains how to keep modernization simple.

RightHand Robotics showcases RightPick2



RightHand Robotics showed its RightPick2 autonomous robotic piece-picking platform, which

Yaro Tenzer, CEO and co-founder of RightHand Robotics, explains how the RightPick2 learns successful picking technique.

handles the picking and placing of individual items as part of a range of warehouse workflows and processes. RightPick2 combines new skills based on RightPick.AI, the AI-enabled vision and motion control software with deep learning.

The system can pick and place thousands of SKUs,



fulfilling orders at high speeds while playing an integral role in consistent order management. "RightPick2 sets a new standard for speed and dependability," said Leif Jentoft, co-founder of RightHand Robotics.

As a materials handling automation company, Right-Hand Robotics is streamlining order fulfillment with flex-

ible, data-driven picking solutions, bringing dependability and scalability to fast growing retail markets.

"Being able to reliably pick a wide range of items at a high rate helps distribution and fulfillment centers improve overall customer experience," Jentoft added, making them more competitive in the global marketplace.

Vanderlande shows scalable solutions

Vanderlande demonstrated Evolutions, the next generation of scalable solutions built to meet the challenges of today's warehouses and DCs. These modular solutions help solve demanding customer expectations such as speed, accuracy and flexibility. The components of Evolutions—FASTPICK, AIRPICK, and STOREPICK—were developed specifically for the e-commerce, fashion and food-retail markets.

"At Modex, attendees can see the latest designs and solutions that we're presenting to the marketplace," said Jerry

Johnson, business development manager at Vanderlande, "and get a feel for the speed, accuracy, flexibility that these solutions drive throughout the entire order and delivery process."

Working with technology, software and lifecycle services, Vanderlande is evolving with its customers to create a next generation of flexible and scalable solutions. The company's offerings include the Adapto shuttle, pocket sorters, goods-on-hanger solutions, and automated case picking technology.

FastFetch unveils carton selection system

FastFetch presented its latest patent-pending solution, the IntelliPack Shipping Cost Optimization System. Using artificial intelligence, the system can determine a set of more than 40 carton sizes (to be used in packing) by examining historical order data.

Using the dimensions of items in an order, the system also decreases shipping costs, packing labor, corrugated material and dunnage, as it selects the carton sizes best suited to pack items—with minimal wasted space—from the set of more than 40.

After scanning an order bar code before or after picking, the system then quickly computes (in less than a second) the best carton size for the order items and indicates that carton, using a segment of LED lights.

"As a result, customers' typical ROI payback period is less than 3 months," said Garry Harper, VP, sales and marketing, FastFetch.

Frazier demonstrates three new structural designs

Frazier Industrial demonstrated three new wire screen designs. Available in reverse, standard and structural pallet support options, the new products use an internal flare "tuck-in" style, as opposed to the industry's current external flare style.

According to EVP Domenick Jellimo, the products help solve two major issues—warping wire beds and jagged pieces of wire—commonly associated with the industry's current design.

"The biggest warehousing challenges faced with the current design are wires bending under the weight of products and being torn apart by fork trucks when loading," said Jellimo.

The new "tuck-in" design eliminates these risks, provides greater safety across the warehouse operation, and is more cost effective than other options. It provides value in any warehouse setting and is particularly useful in environments that rely on hand-stacking or egress with tunnels as part of their applications.



Domenick Jellimo, EVP



Knapp presents the perfect blend of robotics and AI



Knapp discussed its strong business growth over the last year, gave an overview of its latest products, and showed how a partnership with Covariant is helping it create AI-enabled robots for the fulfillment environment.

Knapp's executives gave the audience an update on the OSR Shuttle Evo, of which the company has sold more than 15,000 units since introducing it two years ago. Launched

Heimo Robosch (left), EVP sales, and Josef Mentzer, CEO Knapp North America.

last year, the Pick-It-Easy Evo offers a modular option that can be adapted to any facility.

Knapp's PIE Robot is Cloud integrated and features self-learning capabilities that build and enhance its SKU database. "These features have not been available in the market until today," said Kevin Reader, director of business development and marketing, "and have lifted real world success rates for fully automated order picking from 20% to 95% or more."

Sealed Air exhibits automatic filling and sealing machine

Sealed Air displayed the Autobag 650 Horizontal Wide Bagging System, an automatic filling and sealing machine that can run up to 16-inch wide bags.

Configured ergonomically for left- or right-hand access, the system offers users a large load area for order preparation, along with a highly compressed design that diminishes floor space. In addition, it has a 24-inch conveyor with an open-space design, so users have unlimited access, as well as easy transition, onto other conveyance systems.

Often used with Autobag pre-opened bags-on-a-roll or bags-in-a-box and AutoLabel Thermal Transfer Ribbon, the



From left: Chris Rempe, VP of marketing, Autobag; Fadi Haddad, product manager, Autobag; and Nick Pacak, regional sales director, Sealed Air, with the Autobag 650 Horizontal Wide Bagging System.

system also features an adjustable pass-through length of up to 6 inches, leading to high packaging efficiency.

"Simply put, the system is ushering in the next evolution of wide bag packaging," said Chris Rempe, VP of marketing for Autobag.



Michael Field, president and CEO of The Raymond Corp., highlights the autonomous tuggers, carts, pallet shuttles and analytics solutions that enable granular visibility, enhanced control and repeatable performance.

The Raymond Corp. demonstrates suite of warehouse solutions

The Raymond Corporation exhibited a portfolio of intelligent warehouse solutions to help customers determine the best path toward automation. Using telematics and real-time locating systems, the solutions gather valuable operational data and connect directly with entire fleets, assets and workforces.

The optimized warehouse creates more space for product, increases workforce productivity, and leverages lift trucks for the best suitable task. Using Raymond Lean Management (RLM), warehouses can be optimized by standardizing work, tracking

KPIs and supporting continuous improvements.

After optimizing, Raymond offers products and solutions that can automate a variety of tasks for greater speed and accuracy. "At Raymond, we believe that continuous optimization is key to getting the most out of an operation," said Michael Field, Raymond's CEO. "As an end-to-end intralogistics solutions provider, Raymond can help customers understand the path toward automation and the processes required to meet their specific needs."

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The United States needs to begin preparing for a new normal in its relationship with the UK and the EU. That is to say, U.S. shippers will soon be dealing with each as two separate entities when it comes to trade policy, relationship building and logistics process.

As we edge closer to a prospective resolution to the Brexit saga, many UK ports are actually gearing up for an increase in business with the United States in the future. And if the UK is able to agree on a deal with the Trump administration, then shipping volumes could rise substantially in both directions, painting a positive picture on each side of the Atlantic.

It's an attractive notion for the UK, as it would see a reduction in existing tariffs, especially on its \$11 billion of automotive goods shipped from the U.S. To this end, an initial "light" deal could be achieved by November to deliver short-term political gains for President Trump on the eve of an election as well as Prime Minister Boris Johnson who is still looking to win favor during his tenure.

However, positivity should be tempered if not put to one side before this potential development. In order to capitalize on any impending opportunity, a host of logistical pitfalls driven by EU friction need to be negotiated.

According to John Manners-Bell, founder and CEO of the London-based analyst firm Transport Intelligence Ltd., one layer of complexity for U.S. shippers is that they currently use European distribution centers based in the Netherlands or Belgium to supply the UK. To tap into UK opportunity, the EU linchpin needs to be addressed.

"New documentation will be needed to export outside of the single market, and there may be delays at ports depending on the future deal between



the UK and EU," says Manners-Bell. "Of course, if President Trump does not get his way in negotiations with the remaining members of the EU—and countries such as France show little sign of backing down—then trans-Atlantic volumes to mainland European ports could well be hit by a trade war."

New formalities in a protectionist environment

There is a very real and growing concern among shippers based in mainland Europe about this potential trade

war with the U.S. Now that progress has been made with China and a new NAFTA agreement has been passed, it's expected that President Trump will turn his attentions this way instead.

"Tensions over digital tax, steel and Airbus subsidies have escalated, and Trump has made it clear that tariffs on European automotive manufacturers may be in the offing," says Manners-Bell. "This could be just the first step as tariffs and counter-tariffs are imposed."

It's a variable that couldn't come at a more precarious time, as the concept

State of European Logistics 2020

EMBRACING EU UNCERTAINTY

In the wake of Brexit and continuing trade struggles across the continent, U.S. shippers are urged to be flexible as new formalities take hold.

BY MATTHEW STAFF, UK CORRESPONDENT

of free trade and globalization in general comes under threat. Protectionism and a more insular economic outlook is beginning to take hold amid a wider economic slowdown, which could present a significant danger to trade as tariff and non-tariff barriers are increased.

"The expectation and administrative burden placed on logistics providers and carriers has never been higher," says Paul Carroll, general manager of UK Customs at supply chain software provider BluJay Solutions. "Traditional EU buyers and sellers who have little to

no customs knowledge or infrastructure are now looking to their supply chain and distribution partners to leverage dispatch and shipment data to discharge these new border formalities."

Reactions on each continent

That being said, European logistics service providers themselves are benefiting from a surge in cross-border, e-commerce volumes, according to Nick Bailey, Transport Intelligence's head of research.

"As a result, the balance of business

is shifting from relationships with large shippers to dealing with growing, but unpredictable volumes from small e-traders," says Bailey. "Some of the largest logistics operators have realized that it's in their interests to ensure that small- and medium-sized enterprises [SMEs] have the same access to frictionless trade practices as the large corporates. A lot of effort is being put into developing measures that reduce bureaucracy, and global logistics providers are helping to frame the discussion with customs authorities, other border control

agencies and, of course, politicians."

By trying to open up more nimble sub-sectors of logistics and shipping across Europe, it's hoped that greater adaptability will be achieved when some of the current unknowns spring to life. Ultimately, however, operators both big and small are hanging on the word of EU and U.S. regulatory bodies for more sustainable forecasts, who show no

means, for the next few months at any rate, worries over the future relationship can be kicked down the road," adds Manners-Bell. "The UK, albeit outside of the EU's institutions, will remain in the single market until the end of 2020. For freight operators, this means 12 months of largely business as usual."

From a European perspective on its impact across the Atlantic, there's

For U.S. shippers, the probability of facing further checks, amended criteria, more disputes and wavering tariffs will arise despite new UK opportunity.

immediate signs of a breakthrough.

"Although mechanisms for discussion on convergence exist, disputes are handled through the WTO," notes Manners-Bell. "Cases ongoing presently include complaints about access to the EU market for U.S. exporters of tech, biogen, aircraft, steel and agricultural products. President Trump's lack of confidence in the WTO means that a bilateral approach to future disputes may lead to rising trade tension."

Manners-Bell adds that the EU has already highlighted that it's looking at ways in which it can purchase more U.S. goods in order to address its large trade surplus (\$169 billion in 2018)—a similar move to that undertaken by China ahead of its deal with the U.S. However, the UK's geopolitical standing isn't resolved just yet.

And then there's Brexit...

In this regard, the message to U.S. shippers remains "wait and see." While a seeming breakthrough at the start of this year ignited a little more consumer and investor confidence, it doesn't change the regulatory landscape too much.

"At present EU-UK relations have entered into a transition period which

an equally frustrating level of uncertainty for the longer-term. "Except, of course, that there will be no alignment between the UK government and EU regulations—that is a certainty," adds Lukas Kinigadner, CEO and co-founder of Anyline, an optical character recognition technology provider that has seen first-hand how a trade war can influence trends through its clients in the United States and Asia.

"Brexit is now happening, but without knowing how the legislation will play out, it's wise for shippers to prepare now to optimize shipments for EU and non-EU entry points, for example, as a possible scenario," adds Michiel de Neef, product manager of the BluJay LSP Platform.

Digital agility could offset prolonged volatility

In much the same way as Europe is trying to ignite its SME segment, a more pronounced adoption of digitization may be pivotal for U.S. shippers in reacting quickly to any future relationships with both the UK and the EU. And, indeed, to more effectively organize for divergence in UK and EU trade.

"First, having tools to remove

manual data entry and paper-based processes will help mitigate the risk of delays," Kinigadner says.

According to de Neef, we might also see certain products being directed to either EU or non-EU ports based on tariffs. "In these cases, we might see a favoring of raw materials over finished products to incentivize local production," he says. "A prospective tariff war may well provide optimization possibilities to those that can react quickly."

For U.S. shippers, the probability of facing further checks, amended criteria, more disputes and wavering tariffs will arise despite new UK opportunity. On one hand, the regulations that exist between Europe and the UK serve as a hurdle; while on the other, the U.S.'s own volatility with the EU would have created a barrier with or without Brexit.

However, this challenging situation may also inject a bit of acceleration into practices and methods that the sector has not always been renowned for embracing. As demonstrated by the EU's intended diversification of impetus, when agility and organization are of critical importance amid a new normal of uncertainty, the U.S. could also see this as an opportunity to introspect, enhance local industry, and to more concordently digitize its supply chain.

"In these times of uncertainty, shippers on both sides of the Atlantic can take back some control of their own data," Kinigadner concludes. "Businesses taking proactive steps to harness digitization will be better able to handle volatility in the future, while providing an improved service to their end-customers today." •

Matthew Staff is a UK correspondent
for Logistics Management



Tompkins Robotics' t-Sort tackles micro-fulfillment

Tompkins Robotics can set up its t-Sort unit and parcel sortation system in a customer facility just as fast as it set it up for Modex.

According to Mike Futch, president of Tompkins Robotics, the system can break down and set up within a single shift, allowing customers with limited space to respond to daily busy periods by wheeling out the platform and loading it with mobile robots. Afterward, a 1,000-square-foot sorter, for example, can be collapsed to about 100 square feet for storage, perhaps in an empty pallet rack bay.

A micro-fulfillment solution could easily sort 2,500 units per hour and larger systems can handle 50,000 per hour. The system can also fit into whatever space is available, whether it's shaped like a U, L or Z. The system serves both outbound and inbound flow, and is capable of sequencing replenishment not just by aisle, but by the front left third of an aisle, for example.

For grocery handling, Tompkins is developing a version of their tilt-tray sorter robot with an underside capable of cleaning the surface of the platform. ■

Mike Futch, president of Tompkins Robotics, outlines the variety of options and flexibility of the modular, collapsible T-Sort.



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What does innovation

Modern talked to six companies in our industry to find out how innovation is influencing the market today and how they expect it to affect the future.



mean to you?

BY GARY FORGER,
CONTRIBUTING EDITOR

That sounds like an ice breaker at a corporate meeting. And, it could be. But it's a much more fundamental question to managing forward the disruptions occurring daily within the four walls of distribution and manufacturing.

Innovation is a key influence as to how you and your colleagues approach your business today and into the future. Innovation is also central to how materials handling suppliers think and what they think about. Ultimately, innovation is the sum of all the moving parts that transform challenges into opportunities for greatness, separating your company from competitors.

But, as we all know, innovation is tough. It doesn't just happen. It requires grit and an ability to zig when you've been more comfortable zagging. That isn't easy, but it is manageable. In short, innovation is something you need to make a part of your company's genetic code. Here are what six companies say innovation means to each of them.

Fergal Glynn, vice president of marketing, 6 River Systems

Innovation means proactivity and collaboration. When pragmatic solutions are



Fergal Glynn

presented proactively, it's possible to dig into a solution that shows the underlying innovation a company needs to bring to the market. Tomorrow's challenges can only be addressed if engineers, data scientists, marketers and others come together to discuss the current situation and collaborate on solutions. It's all about optimizing every process in the supply chain.

Faster warehouse fulfillment is depen-

dent on new technologies that generate both immediate and long-term value for the operation. Almost by definition, these technologies and related design principles almost require out-of-the-box thinking to make innovation successful.

The two greatest measures here are increased efficiencies and competitive edge. When warehouse leaders prioritize technological innovation, they're typically replacing outdated systems with more intelligent and advanced systems. Efficiencies skyrocket. When that happens, a company's competitive edge follows suit. They naturally begin to outpace their competitors. And, this can lead to more customers and more success overall.

Such success also helps to attract a broader, more qualified talent pool.

Prospective employees are always looking for innovative companies as well as more fun and unique ways to perform their jobs. People are drawn to new technologies that can help in their day-to-day work environment.

John Santagate, vice president of robotics, HighJump/Körber Supply Chain

Making a meaningful change is what innovation is all about. It requires taking risk, thinking outside the box and having the courage to do something that hasn't been done before. And while most



John Santagate

think of innovation as a big thing, often more subtle innovations have an even bigger impact.

Take how Netflix changed the entertainment content delivery industry. By changing the delivery mechanism and fulfillment model, the company completely eliminated an established market, built a new one and still continues to evolve. That's meaningful change.

Innovation comes in three different forms in supply chain: product, operational and ecosystem.

Product innovation is not just about new products, but step change to existing products. It also includes shifts in delivery models of the products and development of new ranges of product offerings.

Operational innovation requires agility and an ability to adapt rapidly to market demands and shifts by evolving existing operational models. We can make our customers better by mobilizing them around a new technology.

Ecosystem innovation allows us to identify and adapt new, valuable opportunities for our customers. It lets us first identify when and where we need to improve the robustness of our partner's ecosystem and extend into new ventures through non-traditional channels.

Companies need to take a whiteboard approach to the disruptions occurring in materials handling today. Rethinking traditional processes is essential and so are new technologies. Key ones here include robotics, artificial intelligence, spatial awareness, 3D printing and autonomous vehicles. It's a guarantee that materials handling operations today will look a lot different with a new approach to process design and acceptance of a new, more sophisticated technology stack.

Bill Abington, executive vice president of operations, & Paul Ancona, vice president of engineering, Medline Industries

Our customers look to Medline to collaborate on and implement strategic initiatives that help them meet the big-



Bill Abington

gest challenges in healthcare. Innovation can take many forms from multiple small changes within a process to a radical redesign of the entire process.

We do this by solving an existing problem in our own

supply chain or our customer's supply chain. The second approach is to document and flow-chart a process within a supply chain to find areas of inefficiency or higher error rates and then make changes. The third is the most radical approach—a complete disruption by sending our experts to partner with customers and take a whiteboard approach to find a new solution.

Fortunately, new technologies, such as Internet of Things, artificial intelligence and digitization to name three, enable old problems to be approached in new ways. We have a strong bias to embrace and adapt new technology, rather than get disrupted by the technology of others. Key materials handling technologies range from automated goods-to-person systems to robots and autonomous lift trucks.

Ultimately, continuous improvement is the name of the game. There is no end to the game. If you don't continue to think out of the box, adapt and challenge the norm, you will find yourself out of the game before you know it. Disrup-

tion is the new norm. Don't be afraid of new technology. Don't be afraid of failure. And, don't be afraid of change. Everything that we try may not work, but it helps point us in the right direction to find something that does work.

John Rosenberger, director of iWarehouse Gateway and Global Telematics, The Raymond Corporation

At the top of the innovation pyramid sits worker safety and comfort. To make that possible, the lift truck increasingly has to help drivers better understand their surroundings at all times. Traditionally, that ability has focused on the design of the truck hardware. And that is still the case; however, information and software are taking on new importance to improving pro-



John Rosenberger

ductivity while keeping drivers comfortable and everyone safe.

In fact, technology on our trucks is changing much faster than the hardware. However, it's the hardware that is becoming an information platform. We are entering a time when on-board as well as wearable technology offers a more in-depth and granular view of the operating environment. Gut feel is being replaced by real data.

And when companies network that data, they can leverage it to develop solutions to operating challenges across a facility. The days of each truck as an independent piece of equipment are fading quickly. It's now all about the fleet. Plus, we're now in a position to offer software as a service (SaaS) that can be turned on for peak periods and turned off when

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that data is not much needed. Different functionality and features can now be an operating expense versus capital expense using SaaS.

These and other innovations are essential to embracing the changing

operating environment of warehouses and DCs. As e-commerce grows, we are developing ways to optimize operations before introducing automation. Connecting your data sources to provide a more complete view of your operations

is a key first step, followed by using this data to find areas that may benefit from operator assist technologies like pick-to-light or zoning and positioning. Another optimization step can be realized through shared autonomy, using people to manage exceptions and automation to handle the rest. It's a matter of taking advantage of people, hardware and information and using connected devices for the safety, comfort and productivity of all.

Chris Arnold, president and COO, TREW Automation

Innovation is all about challenging the status quo. It starts with a vision of a better solution, then looking at the application of data, practices, requirements, hardware and software that could be used to deliver on meaningful results, to create. As an industry, we are data rich and information poor, and our client's operations are needing to evolve quickly to meet tomorrow's challenges. Innovation is what will push us forward, but it doesn't always have to be in one giant leap. Innovation can take many small steps along the way often in simply a different direction. We, as an industry, need to help logistics operations find the wisdom and insights in the data.



Chris Arnold

I'm describing this as I attend the RILA (Retail Industry Leaders Association) conference. The retail landscape is transforming where e-commerce, store retail, store fulfillment, and BOPUS (buy online pick up in store) are now becoming singularly focused as simply commerce with little to no distinction. To keep pace with the many shifts in retail, materi-



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als handling must continually innovate. There's heavy pressure to improve what happens in the DC as well as in logistics and the overall supply chain.

It's important to realize that this is not just about building a better, smarter conveyor. It's about creating a new operating system by looking at alternatives to how things run today. You need to build software from the bottom up to take advantage of the data, processes and equipment allowing for the unlocking meaningful operational potential. System integration innovation is all about putting all the pieces together differently to create a perfect patchwork quilt that anticipates problems, corrects them even before they occur, and ultimately delights the customer. We must continually create ecosystems that deliver meaningful improvements and results for all.

Mark Wheeler, director of Supply Chain Solutions, Zebra

You've got to keep your eye on the ball and drive toward value while being open to change to be innovative today. For



Mark Wheeler

technology-driven change, we're in a particularly dynamic time that will challenge everyone in the supply chain. They will question their practices and the tools used to run them. Systems of

reality that sense the physical world and provide a true real-time visibility will power much of this transformation.

Getting there requires collaboration across the supply chain, observing current practices and jointly innovating to create new tools to improve operations. Traditionally, various systems have offered glimpses into the location or

condition of an item. New systems will increasingly sense the environment more directly and completely.

Such innovation will bring with it greater visibility that will allow new levels of optimization and keen operational

insights. Machine learning, in particular, will significantly improve overall performance. This new level of operational visibility will enable execution systems that can adapt to operations that are constantly in a state of change. ■

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New Automation Technology

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Technology lifts overhead handling to new heights

With sights set on ergonomics and worker turnover, makers and users of cranes, hoists and other lift assist technologies are letting the data guide the way.

BY JOSH BOND, SENIOR EDITOR

Supporting and retaining your warehouse employees may be the best way to address the labor shortage. Although technology investments tend to focus on the relentless need to increase productivity, it's a delicate balance between employee optimization and burnout. An injury, whether isolated or cumulative, creates another unfilled position. Other workers might leave a strenuous job before it gets to that point, lured by even a relatively small paycheck bump.

In this climate, safety and ergonomic improvements are weighted much more heavily in purchasing decisions. Overhead lift assist technologies like cranes, hoists and vacuum lifters are a growing segment as employers seek to improve working conditions. Grant Welch, manager of handling systems applications engineers for Schmalz, says customer focus varies from reducing turnover to preventing injuries or speeding throughput, but one theme is consistent.

"Things are trending more toward safety than they ever used to," Welch says. An automotive type manufacturer's concerns and ROI calculations are different than, say, a mom-

and-pop wood shop, "but I would say more and more are following the European countries in terms of being very safety conscious. For attracting and retaining employees, quality of life can be a big differentiator."

As a result, Welch says more companies are requiring lifters for lower weights, even for 15 pounds, because lifting 2,000 units per day adds up. "They're now looking at the total tonnage a person is handling and then building requirements around that," he adds.

That said, new equipment or smart features are only part of the battle. From design to deployment and beyond, worker input is essential.

"We definitely run into folks who get mad at their operators for not using a tool they spent good money on, but they still have productivity rates to hit," Welch says. "If you're going to incentivize them to put out as much as possible, they'll grab bags by hand if it's faster."

Modern reached out to several suppliers of overhead handling technologies to explore the ways the latest equipment, or upgrades to classics, are finding the sweet spot between speed and user friendliness.



Safety-conscious employers looking to retain their workforces are offering lift assist equipment as job quality differentiators.

Tailor the tool to the task

Customization and a growing menu of options are becoming the norm for materials handling technologies. Although they are among the simplest equipment, lift assist technologies are along for the

ride. Connectivity features are increasingly standard and can be added on to existing cranes, hoists and positioners.

Customers are looking to leverage more data, or fill in data "holes," according to Jeff McNeil, vice president of market-

ing and innovation for Gorbel. An expensive machine and sophisticated conveyor will collect lots of data, but if the lifting device between them isn't smart, it's hard to paint a complete picture of the process.

"Many end users still assume there are only two extremes: handling 80-pound bags by hand or using robots. But, there's now a spectrum with more options in the middle," McNeil says.

Growing companies tend to move incrementally, McNeil says, and new solutions aim to support them along the way. A machine shop might start with a prime focus on customers as opposed to efficiency, and will be drawn to multi-purpose equipment like a forklift for lifting, loading and unloading.

"When operated safely, they are wonderful, but they're not the most efficient use of space or manpower, and not always the safest," McNeil says. "There's an evolution for many of our customers toward efficiency and ergonomics. As business gets better and labor or space constraints tighter, they can't afford forklift-sized aisles in the facility and near the machines."

Joe McCabe is the engineering manager for Columbus McKinnon's newly formed automation division, which is developing solutions to enable customers to make gradual transitions now and going forward. He says when upgrading or designing replacement equipment on a crane, many users are now trying to make their equipment "automation-ready" for future use.

"To that end, we use diagnostic and analytics solutions that collect, organize and analyze data from measurement points throughout the equipment, from the incoming power, through the control systems and out to the driven loads," McCabe explains.

Reports might include:

- analysis of power consumption and quality;

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The decision to deploy lift assist equipment might be based on the total weight handled over the course of a shift, as opposed to individual items.

- variable frequency drive currents and fault histories;
- vibration and temperature feedback from drives, component enclosures, motors and bearings;
- gearbox oil viscosity;
- cycle counts of motor starts, stops and brake actuation; and
- total distance of motion.

Taken together, these data points help to build trending histories to aid in the budgeting and scheduling of preventative and predictive maintenance activities. Remote access on smart devices and PCs allows users and technicians to view equipment status in real time, or configure text and e-mail alerts about production, alarms or faults.

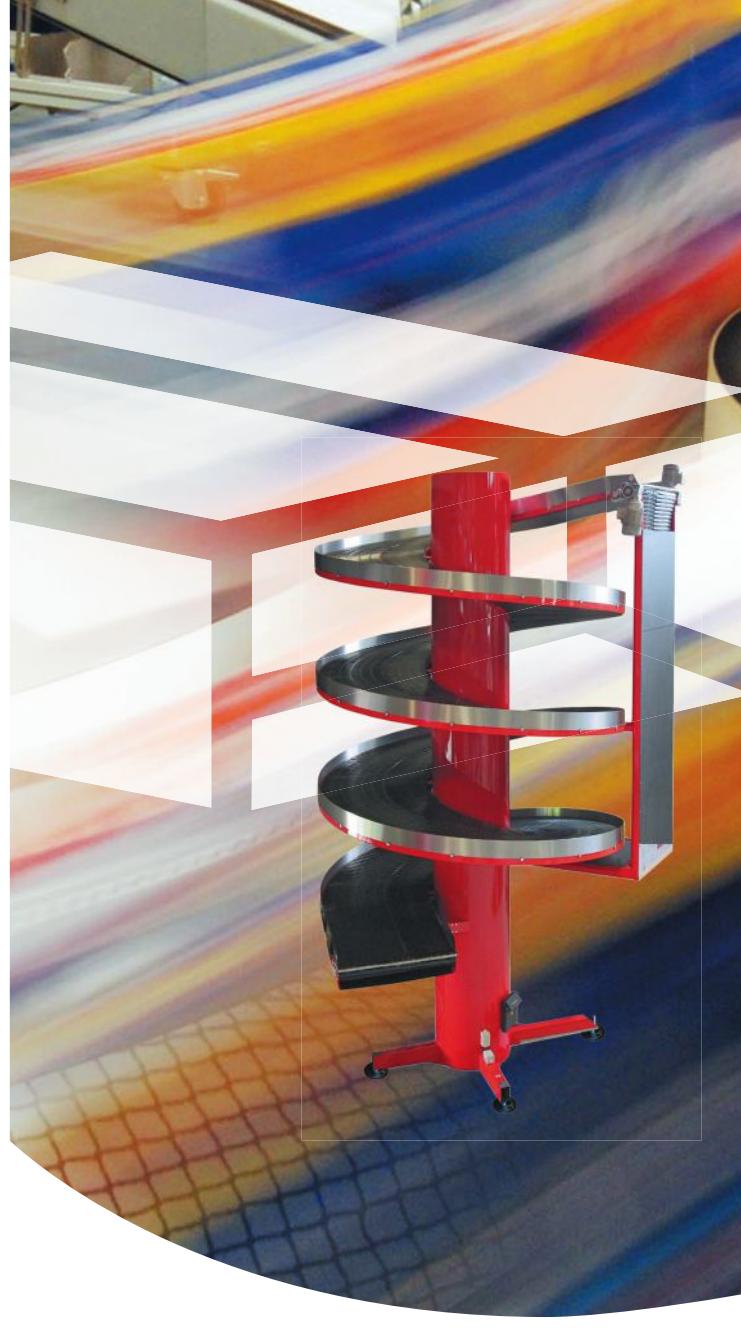
"In many cases, PLC hardware and network communications are an easy way to support future upgrades, but it's important to have a plan," McCabe says. "Users should start internal conversations early to fully understand how existing equipment is utilized and to determine the cost and benefits of each upgrade for a favorable ROI."

Get a feel for the application

Ergonomics are the central factor driving innovation, but it goes beyond physical concerns like how workers place their hands on equipment, bend at the waist, or strain their eyes to see controls. Instead of single- or dual-speed motors, the latest hoists are often servo-based, providing a range of speeds, increased precision and reduced maintenance.

"A traditional hoist has no intelligence, so it can't stop an operator from slamming down onto a machine," McNeil explains. "Ergonomics might be great, but quality and cost elements are not always addressed."

Servo control enables users to set limits depending on context. If a load is suspended over a machine, sensors will detect its position and prevent the operator from lowering beyond a certain point. These rules can even be load-specific, with one threshold for part X and another for part Y. For precision movement, the system can automatically drop to



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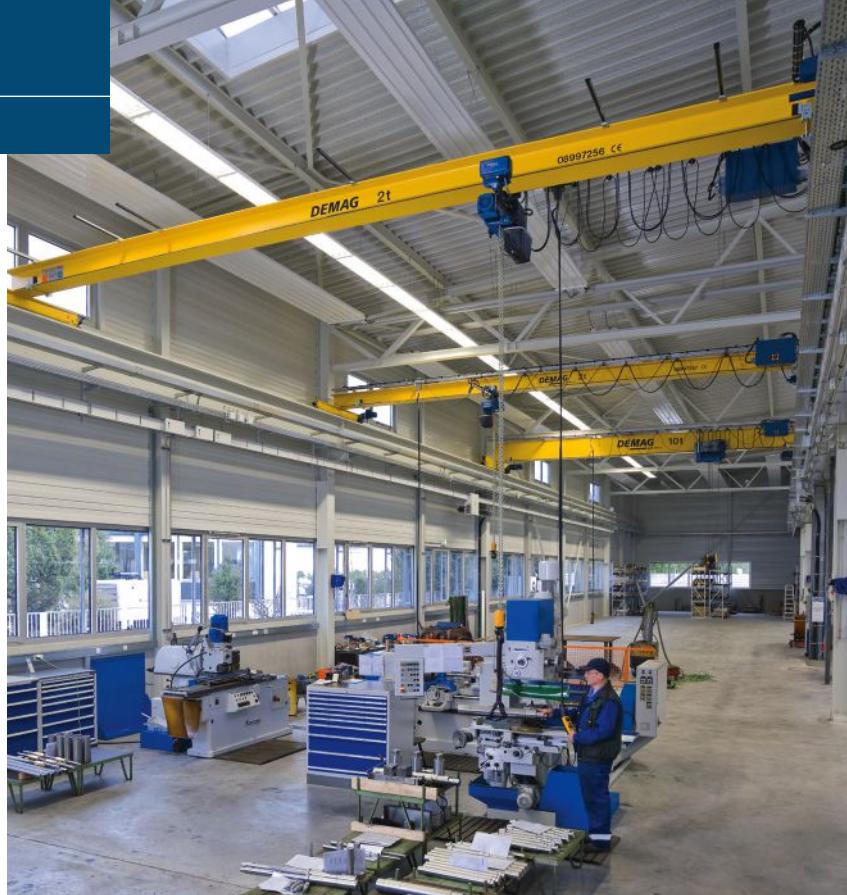


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creep speed when a few inches away from its destination. McNeil describes a “float” function enabling an operator to take both hands off the controls and guide an item into position as though it were weightless.

“The idea is to use technology to simulate and amplify a worker’s ability to take uncertainty out of the process,” McNeil adds. “Technology can leverage the operator’s eyes, dexterity and intelligence without allowing them to harm themselves, machines or parts.”

Martin Marincic, director of product support for Demag, emphasizes how servos and software can keep physics from creating unwanted surprises. Anti-sway software can control acceleration and deceleration to prevent loads from swinging, no matter how fast the operator commands it to move. “You can count on an inexperienced operator to operate safely because they have that control,” Marincic says.



Intelligent lift assist equipment can keep track of productivity, maintenance needs, and even nearby obstacles.

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Connected and intelligent hardware and software also capture valuable data about the operator's performance. Capturing is good, but McNeil says communication is even better. Recent models might require someone to plug in to extract historical data, but if reports show a unit overloaded several times in a shift, by then it's too late to take action. To support preventative maintenance (PM) as well as unscheduled issues, real-time IoT capabilities can transmit data over Bluetooth, cell or network to maintenance personnel, managers or Cloud-based remote monitoring services.

"We do see a lot of people just running them until they break, and occasionally we get there and have to lock out poorly maintained equipment immediately," says Marincic, who adds that smart features like tracking cycles, hour

meters and average loads are only part of the solution. "By its very nature, a hoist and its components will wear, and you have to be mindful of that. It can be a chore, but in addition to replacing worn parts, we recommend a periodic overhaul, which more and more customers are embracing."

The experts all encourage performing periodic and annual crane inspections and discourage shortcuts. Avoiding the manufacturers' recommended maintenance intervals and procedures is a sure path to equipment failure and unplanned downtime. Customers should plan to keep spare parts on hand and be sure they are OEM parts since substi-

tutes can undercut software's ability to accurately calculate predictive maintenance. If available, the manufacturer or an authorized repair center should be used for all service work.

Companies mentioned in this article

- Columbus McKinnon
- Demag
- Gorbel
- Schmalz

"Automotive-type operations are so used to PM schedules they follow them to a T. Those are probably the exception," says Welch, "If you have any kind of PM schedule, tie in your lift assist equipment so you're building off what you already have. If you know you will be changing tooling every two weeks on a CNC, take five minutes to look at a vacuum lifter and check the filter. You have to make it a habit or else you're waiting until it fails." ■

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4 paths to voice systems evolution

During the last several years, voice-directed work solutions have evolved beyond their roots in order picking. Suppliers now often support multiple device types, including rugged smart phones and smart glasses, and implementations may span multiple workflows. Here are four ways voice solutions have evolved, including plenty of analytics features for managers.

BY ROBERTO MICHEL, EDITOR AT LARGE

As distribution centers struggle with labor-intensive e-commerce fulfillment and difficulty finding enough workers, making order picking as efficient as possible is high priority. No wonder “voice” solutions that direct warehouse associates through fast and accurate tasks are growing.

With voice-directed solutions, order selectors can work largely hands free allowing them to focus on picking or other tasks. The voice instructions may also feature confirmation steps to increase accuracy. These traditional voice benefits have fueled a growing market. Globally, voice solutions are set to grow at a compound annual growth rate (CAGR) of 15% through 2025, according to KBV Research.

However, the value proposition in today's voice market goes well beyond order picking, or even voice, say vendors. For one, multiple types of wearables are being used to create a market that's more about multi-modal work automation than pure voice. Over the last several years, vendors have upped their game around analytics and other solutions that also help managers get the most from the workforce. Here four ways voice solutions are evolving to help operations become more efficient.

1. Multi-mode interactions

The traditional voice headset, tethered to a small device on a belt, has been replaced by a wider variety of wearables, as well as advancements in headset technology, including wireless Bluetooth headsets. Device options today span smart



phones, ring scanners, smart glasses with augmented reality (AR) capability, or wearable vests with voice hardware built in. Vendors vary in the type of wearables they support, but overall, vendors now support multiple device types, often running on Android.

“Everyone still refers to this market as voice solutions, but if you walked into one of our customers' facilities and observed how they use our application, you'd figure out pretty quickly that voice is just one component of the solution, and in some cases, a relatively small component of the overall solution because they



may be using ring scanners, vision for data capture, or AR,” says Keith Phillips, president and CEO of Voxware.

Devices for voice used to be small, purpose-built units attached on a belt, with a wired headset. This has evolved with the broad acceptance of Bluetooth headsets and ring scanners. The wearable scanners allow for quick item scanning for purposes like serial tracking. Some voice vendors also support the use of smart glasses, using the microphone/speaker in glasses to facilitate voice interactions and the glass to convey information visually.

Another hardware evolution has been the embrace of Android by major providers of rugged mobile devices. Vendors today offer a variety of Android devices, with extra device security and management features added. Some device vendors such as Zebra Technologies have created a common environment for Android functions that voice vendors can use to test and certify their solutions on multiple devices, says Scott Deutsch, North American president of Ehrhardt + Partner Solutions.

These platforms make voice solutions more attractive for



A Voxware customer reviews graphical data in an analytics dashboard.

end user organizations, says Deutsch, because vendors can quickly certify many Android devices with less effort. In addition to being able to serve as voice devices, Android mobile devices also offer capabilities like touchscreens, push to talk or smart phone features that make them attractive for use with warehouse management system (WMS) software or other solutions.

While smart glasses garner much attention, Deutsch sees the rapid uptake of Android as having greater impact on the voice market. "The explosion of rugged Android devices by trusted device vendors has dramatically changed the perspective of customers on what their device choices are," says Deutsch. "There is a lot more freedom of choice today."

2. More than picking

Sure, picking each-level orders from forward pick areas is voice's bread and butter, but vendors report many users are now using their solutions for workflows such as cycle counting, replenishment or receiving and put away.

With today's tight cycle time pressures, it's important to speed up multiple workflows, not just final pick areas, says Phillips. "Distribution center managers

have really had to focus on the overall speed of their operations, and how they've architected their processes," he says. "Every customer we've deployed over the last four years has ended up implementing multiple workflows."

Improved ease of integration between voice solutions and WMS is seen as a key enabler of being able to cost effectively deploy added workflows. Using application programming interfaces (APIs) such as REST APIs, voice solution providers can deploy added workflows at greater speed and lower cost compared with the integration technology and more heavy testing necessary in the early days of the voice market, points out Deutsch.

"The ability to rapidly integrate additional voice workflows with back-end WMS solutions with Web services has really reduced the cost and complexity of integration," says Deutsch. "That makes for a stronger cost/benefit equation when you want to deploy an additional workflow to even a small group of front-line workers, like a handful of people doing replenishment. As a result, we're seeing more adoption of voice across various workflows."

While in the past many organizations began voice implementations with order picking, today many of Honeywell's

Voice solution users are applying voice to upstream processes like receiving, put away and replenishment, says James Hendrickson, director of product and offering management with Honeywell Safety and Productivity Solutions.

Voice automation of these upstream processes not only speeds up overall cycle time, it reduces errors that can foul up picking. "As more organizations deal with e-commerce where the cost of errors is really high, we've actually seen some of our customers who've deployed voice first for put away or restocking, because they want to speed up and improve the inbounding process," says Hendrickson.

Another shift in voice workflows involves robotics. For one thing, explains Hendrickson, voice can be a productivity enhancer for maintenance technicians servicing automated systems. Beyond that, Honeywell has been working collaboratively with autonomous mobile robot (AMR) vendors including Fetch Robotics and 6 River Systems to examine ways in which Honeywell's voice-directed solution can blend with AMR workflows.

Possibilities include combining a pick-to-light workstation for goods-to-person robotics with some use of voice-directed tasks. It's also possible voice could be used as a trigger to command a robot to move somewhere or as an alternative means of interacting with AMRs versus always using a touchscreen.

Hendrickson says it remains early days for figuring out the best ways to mash up voice-directed and robot workflows, but it makes sense to use the technology that is most efficient for each task. He adds that Honeywell has worked with some AMR vendors to test blended scenarios and has been demonstrating some of these at industry events. "The point is that you have options regarding the best interface,

and you'll be able to pick the one that best suits your implementation," he says.

3. Analytics for managers

Traditionally, the key users of voice solutions are front-line workers. Voice-directed vendors, however, have long offered analytics for managers. These offerings have continued to evolve in sophistication and their ability to provide decision support beyond basic "descriptive" analytics such as lines per hour picked.

"What's becoming more important is the predictive and prescriptive analytics capabilities that allow you to anticipate and prepare for what's coming down the road tomorrow, next week or for the next peak season so managers can set up the operation for success," says Phillips.

Analytics increasingly are used to plan out resource needs, says Phillips, as well as managing daily operations or spotting potential trouble spots. "Using analytics, you can make sure you don't have a worker who has completed a set of assignments, but hasn't been given a new assignment yet, or to ensure you don't have a worker running behind on an assignment to the point an order is becoming at risk of missing the shipment time," he says.

Deutsch agrees that analytics has become increasingly important. A tool from E+P called TimesSquare Cloud Analytics is aimed at providing end-user organizations with a Cloud analytics cockpit that can bring together multiple data sources and live graphics like digital maps or live camera feeds that show activity at docks or with automated machinery. For one user, says Deutsch, this tool provided a way to create a dynamic dashboard without having to run back to its corporate information technology (IT) department for a special



Some voice solutions such as apps from Lucas Systems are able to use a smart watch as the client device.

project. "It's a solution that is meant for the operations side of the business, so they can bring together multiple data sources without getting into a large IT project," says Deutsch.

4. Workforce optimization

Some vendors with roots in voice solutions, such as Lucas Systems, have branched out into related solutions aimed at improving "work execution" processes. Lucas's Engage makes use of data from voice activity, but it's more than an analytics module for voice, says Justin Ritter, director of project engineering for Lucas Systems. The difference is work execution has optimization functions that consider various factors including order priorities and gate/shipment commit times to orchestrate work execution in a warehouse.

For example, a module in the solution, called Dynamic Work Optimization (DWO), uses advanced mathematical models to drive intelligent batching and pick path optimization. Thus, explains Rit-

ter, DWO is an optimization function that managers don't have to sit down and use like an analytic module, but that works to address a key pain point—reducing the time that workers typically spend on travel to pick faces or other points of work.

"If you look at how much of warehouse workers time is spent actually doing picks or put movements in front of a location, it might only be 30% of the shift time with conventional approaches, but what about addressing that other 70% of the time—the travel time," says Ritter. "When we talk about work execution and work optimization, it's about the best way to execute work relative the priorities to come up with efficient batches of work. By batching things differently, and doing pick path optimization, you can really optimize your workforce and get more productivity."

Work execution solution not only coordinates voice-directed tasks, it orchestrates multiple activities and systems, says Ritter, factoring in order priorities and order completion. The software also can consider work-in-process

status to check whether some areas of the warehouse are too busy or not busy enough when deciding how to execute work.

Additionally, says Ritter, work execution should be able to consider robots as a labor asset and assign tasks to them and coordinate their work with tasks carried out by humans. "From a management perspective, execution is

really about optimizing all your assets, whether that labor is in the form of a human picker or a robot, to get the most efficiency from your operations," he adds. ■

Companies mentioned in this article

- Ehrhardt + Partner Solutions
- Honeywell Safety and Productivity Solutions
- Lucas Systems
- Voxware

By **Josh Bond**,
Senior Editor

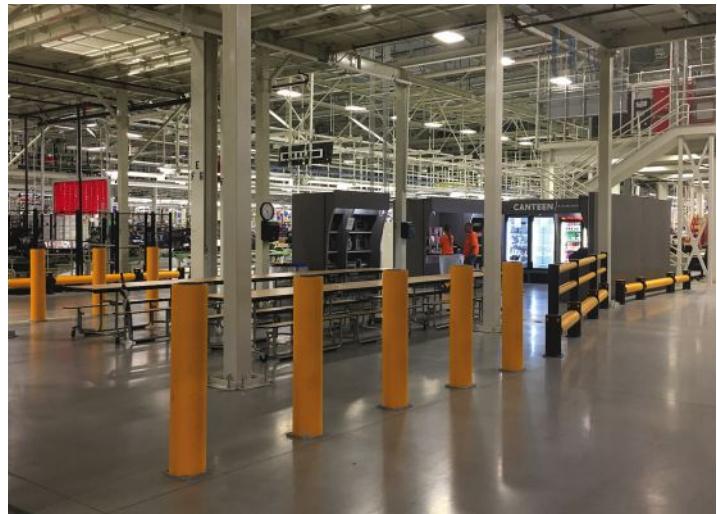
Protective guarding goes the extra mile

Custom solutions optimize traffic flow, boost pedestrian safety and protect infrastructure.

Volvo's new facility in Ridgeville, S.C., will eventually employ more than 4,000 people and a sizable fleet of lift trucks. To get a head start on facility safety, the company installed a full suite of impact-resistant products including traffic barriers, column protection and pedestrian guarding.

The new plant consists of three main buildings: the weld shop, the paint shop and assembly shop. The company wanted premium protection for its employees, infrastructure and assets, with a particular focus on areas with high traffic like the vehicle assembly area where thousands of individual parts go into making each car. These components need to be transported, stored, picked and transferred to the assembly lines. The facility was operational during two main installation phases, which saw almost a mile of safety barriers added through the campus.

The barrier manufacturer conducted a full safety survey, assessing intersections, crossing points, traffic areas and machinery that needed to be protected. Volvo decided to limit the movement of its largest vehicles to specific areas, mainly the logistics receiving areas. Tailored solutions were installed in all required areas, including pedestrian railing, high-level barriers and column guards, gates and bollards. The new equipment (A-Safe) is made from a patented blend of eight materials and rubber additives



that absorbs impacts without incurring damage to equipment or the barriers.

"The depth of the product range provided the flexibility to meet our wide variety of applications," says Robin Ollis, layout planning engineer at Volvo. "The strength of these safety barriers is impressive. They have demonstrated their ability to protect our people, equipment and the facility from the day they were installed. It was a pleasure working with the team from product selection through layout design and installation."

Volvo plans to expand the facility further and will install additional barriers and safety equipment. ■

Li-ion technology enhances fleet effectiveness

Lithium-ion lift truck batteries help food producer save more than half a million dollars.

Allan Brothers, a century-old vertically integrated fruit company, manages its own farm acreage, growing apples, cherries and wine grapes. With 600 full-time employees and 2,500 workers during peak harvest season, the operation also packages and ships its fruit, along with third-party fruit, to locations across the United States, Canada, Mexico and other countries.

In 2018, as the company prepared to install a new state-of-the-art fruit packing line—which it claims is the biggest in the world—management realized the costs associated with lead acid battery-powered electric lift trucks were adding up. Time spent changing batteries during shifts was costing \$56,000 a year and another \$7,800 a year in watering maintenance costs. What's more, the expansion required a new battery room estimated to cost another \$440,000.

With a fleet of 30 lift trucks working two shifts, each required a battery change per shift. Forklift drivers also operated the battery-changing crane and watered the batteries. Managers figured maintenance caused 750 minutes of downtime daily. At the same time, the business was deciding on the next lease term for its lift trucks. By equipping its fleet with Li-ion batteries (OneCharge), the company saved on ongoing maintenance costs while reducing the investment needed for the 300,000-square-foot expansion.

Li-ion spared the expense of a battery room and battery changing, but it also improved lift truck



efficiency as a result of better battery performance. Managers also valued the enhanced safety, eliminating the need for employees to work with lead acid batteries and improving conditions for the company's food product lines. The reduced health risks meant lower insurance rates for all 30 lift truck operators, totaling \$6,000 in savings per year.

Batteries plugged in overnight are completely charged by the start of a shift at 3 a.m. The fleet also uses opportunity charging during 15-minute breaks and 30-minute lunch breaks. The batteries continue to operate at close to 100% of the original capacity throughout shifts. The company's lead acid batteries had gradually decreased in power, slowing down by at least 20% over time.

Because Li-ion batteries can run for more than 3,000 cycles, compared to an average of 1,500 for lead acid, Allan Brothers also expects longer battery life. Management says it's likely the batteries will outlast the current five-year lease term for its lift trucks. When new leases are signed, the company anticipates reduced prices as damage to the trucks from daily battery changes and corrosive acid spills are no longer a factor. The company expects to cut battery costs by 20% to 40% within two years. ■

AUTOMOTIVE: Anything but routine

Automakers are finding new ways to improve operations and reduce costs while accommodating fickle consumers who want every feature imaginable. That's typically a tall order, but it's even more so in the highly competitive auto industry.

BY GARY FORGER, CONTRIBUTING EDITOR

Sometimes it's worth a minute to review some of the basics of an industry before talking about its materials handling trends. Automotive is one of those. So, here we go.

Last year, roughly 17 million light trucks and cars were sold in the United States. Light trucks accounted for 70% of that number. Electric vehicles (EVs) were about 2%. In 2019, there were 257 models with 36 of those considered new models. However, 257 is quite a comedown from more than 400 models sold 15 years ago.

As we all know, automatic transmissions dominate. Manual transmissions are in just 20% of all models. However, EVs will make both manual and automatic transmissions obsolete.

On the surface, it sounds like we're trending toward fewer options than before. But, nothing could be further from the truth. Instead, options have proliferated. Just think back to the last time



A forked AGV lifts, positions and stacks a rack of parts.

you wrestled with a car dealer to get all of the specific features you wanted.

While none of us gives a hoot about what it takes for the automaker to build each vehicle as quickly and efficiently as possible in large numbers, it's even worse than we can imagine. Your car and mine are right next to each other as they move down the assembly line. And, you sure don't want my ugly wheels.

Clearly, building a new vehicle isn't getting any easier. And that's where materials handling is having its biggest impact on the auto industry today.

Key trends here include:

- cost reduction through automation,
- error-free, in sequence parts delivery to the line,
- maximum density to optimize efficiency,
- transparency and visibility, and
- connected operations on the way to digital.

Meanwhile, we're at the very early stages of the move to EVs. On one hand, that shift will reduce the number of parts that go into a vehicle. Some say as much as 50%. The impact that shift will have on the automotive workforce was the centerpiece of auto industry labor negotiations last year.

However, auto companies will be balancing a long-term transition from internal combustion cars to EVs for many years to come. That change will bring on its own host of materials handling challenges.

The power of automation

Ask suppliers about the trajectory of automation in automotive, and you get a range of answers. On the one end is



A curtained over-the-road truck has several layers of curved roller conveyor to protect and handle wheel tire assemblies.

a projection that almost all materials handling will be automated in the next 10 years. Others predict a more gentle move to automation. The timeline specifics are probably less important than the steadily increasing move to automation overall.

"There are heavy pressures on auto companies to reduce costs, and automation is central to that effort," says Greg Pachuta sales manager at JBT. With the labor contracts settled last year, he says, automakers are in a better-defined position to move ahead with automation on a broader scale.

"Various aspects of building cars are either fully or nearly fully automated already. Painting and welding are two examples," explains Matt Rendall, CEO of OTTO Motors. But as he points out, much of materials handling today is still manual. That, he says, will be a problem going forward. "If automakers don't figure out large scale automation for materials handling, then it will become a major bottleneck and a cost drag."

Fortunately, options are available for automakers. They range from automated wheel tire assembly handling to

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automated storage and retrieval systems (AS/RS), conveyors and a combination of automatic guided vehicles (AGVs), automated mobile robots (AMRs) and automated lift trucks.

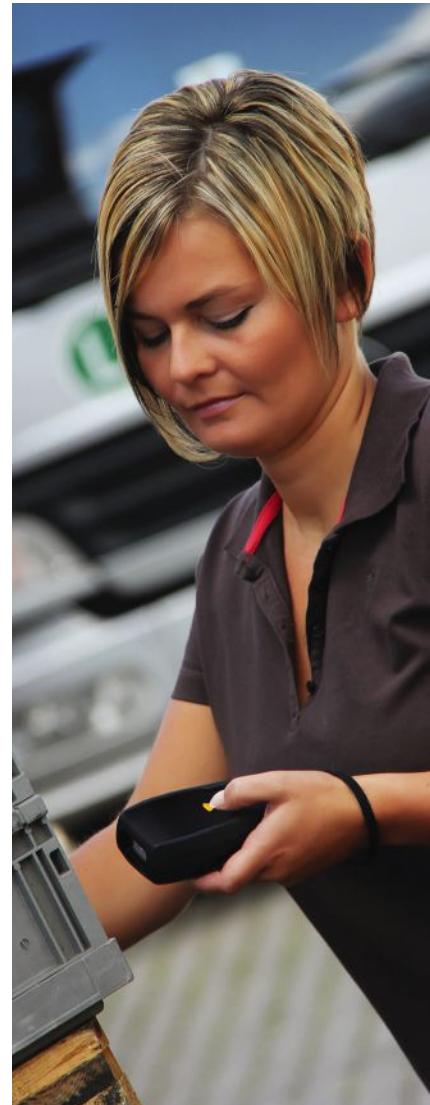
Richard Canny, president of Ultimation, talks about automated handling of wheel tire assemblies from side curtained over-the-road trucks direct to assembly lines. Those trucks are stacked seven high with assemblies that move along curved roller conveyor until they exit the truck. There, in-plant conveyors move the assemblies to the line and to the mounting station. None of this was in place not so long ago. Today, it is not at all uncommon, and it's growing.

Just as important as automated handling, says Canny, is error-free, in-sequence movement of those assemblies. This ensures efficiency and accuracy at mounting the right wheel tire to the right car coming down the line.

It's worth noting that error-free, in-sequence handling has become a core competency of building vehicles, regardless of the part. "Successful line production overall is all about the right part in the right sequence at the right time," reiterates Canny. "The target," he adds, "is always fewer sequence errors, less damage and higher productivity that translates into lower assembly costs."

Making this happen isn't always a slam dunk, however. Different parts of the line move at different speeds. That requires buffering and accumulating conveyors, especially zero-pressure accumulation, to pace the in-sequence delivery of parts. The result is handling complexity and increased opportunities for error.

AS/RS is becoming increasingly important here, too, says Robert Humphry,



Information about automotive parts is becoming increasingly important to the flow of parts inside auto plants.

manager of system sales at Bastian Solutions. "Space constraints are common. Some facilities are landlocked not to mention the departments within those facilities. So, automakers have to maximize density in the overall process to optimize efficiency," he says.

Humphry cites the efficiency gains of ultra-dense AS/RS as a major weapon. Big is good here. He talks of high-bay 120-foot-tall and taller rack-supported

buildings with a minimum of aisles and up to 12-deep storage. This is a trend that will continue for the foreseeable future, says Humphry.

Automation that moves

AGVs have long been an important and visible part of the assembly process. While best known as tuggers of trains of parts over long distances, forked AGVs have also been used to lift, position and stack racks of parts, especially in what is known as supermarket parts staging areas.

Automotive's interest in AGVs, says Creform's vice president of sales Keith Soderlund, is three-fold—predictability that removes human error, safety and answering the lack of people needed to get the job done.

Those supermarket staging areas



Small guided vehicles pull a rack of parts from a supermarket staging area direct to the assembly line.



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are prime example of all three at work, says Soderlund. "It's all about inventory management and error-proofing picks, sequence sets and movement to the line," he adds. Because there is so little extra space lineside, it's imperative for racks moved by small guided vehicles to move parts from the supermarket to the assembly location on a very just-in-time basis before returning to the supermarket for another load.

Automated lift trucks are also a part of this landscape. Now it's important to note that no supplier of lift trucks supplies automated lift trucks to automotive. Instead, AGV suppliers such as JBT provide retrofit kits for lift trucks. Pachuta of JBT sees that trend continuing as automakers work to eliminate labor wherever possible.

AMRs, however, are the untapped frontier for automotive automation. Today, only a few AMRs are working in automaker plants in the United States, or elsewhere for that matter. However, that is going to change, says Melonee Wise, CEO of Fetch Robotics. "Automakers want maximum flexibility to optimize their processes," she says. "The ability of AMRs to create a path on the fly that accommodates workflow modifications even by the day has great potential."

AMRs are better suited to moving smaller loads than AGVs traditionally have, observes Wise. One of these pioneer applications is at third-party logistics provider Universal Logistics Holdings in Smyrna, Tenn. The 1-million-square-foot facility serves the nearby Nissan plant, the largest in North America. Ten Fetch robots work with 40 carts to automate several key processes in the warehouse, freeing people to do more valuable work.

Rendall says OTTO Motors has AMRs in several Japanese plants. Tier 1 supplier HIROTEC Hiroshima uses AMRs to deliver Mazda door panels to welding cells in Japan. Meanwhile, Toyota uses them to sequentially load and deliver parts lineside at plants in the United States.

Better connections

Just as automation creates better handoffs on the physical handling side of automaking, several advances on the information side

are making plants better connected and production more transparent and visible.

Ten years ago, Wi-Fi was uncommon in auto plants. Today, it's just the reverse. But that's only a first step. "We're still in the early stages of harnessing information in plants. Wi-Fi is a first step toward a digital facility. First, the machines have to be connected to establish a flow of information," says Rendall.

As Bastian's Humphry explains, cameras are part of making those connections. Cameras for parts inspection as well as tracking parts movement along with bar codes are part of this shift, he adds.

"RFID is also contributing to improving visibility. Being able to locate goods throughout the supply chain is a growing concern for all OEMs," says Dana McBrien, guiding architect for AutoSphere at Surgere.

A leading application here is tracking returnable containers with RFID, says Andy Schumacher, vice presi-

dent of the packaging division at SSI Schaefer. He estimates that 15% of all returnables are tracked with RFID today.

That number will continue to grow especially over the next three years. For more details, see *Modern's* Packaging Corner from the March issue.

The times are changing

For some time now, says Canny of Ultimation, model changeover times have become shorter and shorter. What used to be two to three months is now 30 to 45 days.

Tesla fits right in to this trend. "Tesla is willing to pick partners quickly and expects its partners to be quick about materials handling equipment installs, too," adds Canny. Furthermore, the handling needed for EV parts is different than internal combustion cars because the parts themselves are different.

That combined with shorter changeover times is fundamentally changing materials handling systems. "Modular solutions and even pre-configured ones are going to become increasingly in demand," says Canny.

Automakers are starting to prepare for these shifts in materials handling, says Soderlund of Creform. "This will be a 10- to 20-year transition and people are just trying to understand it now. It's impossible to say definitively today what all this means. It will definitely transform materials handling and well shrink its footprint in auto plants. Automakers are just going to have to operate differently," he concludes.

Clearly, automotive is anything but routine. •

Companies mentioned in this article

- Bastian Solutions
- Creform
- Fetch Robotics
- JBT
- OTTO Motors
- Ultimation
- SSI Schaefer Systems International
- Surgere

Paperless software system replaces spreadsheets and radios

In the past, traditional logistics operations coordination methods, such as spreadsheets, two-way radios and yard checks on foot, offered limited and dated information, which increased the complexity of communication. To reduce this complexity, receive more up-to-date information and, in turn, improve productivity, facilities can now use a paperless software system. Known as Dok-Vu, the system enables users to coordinate their tasks and communicate in real time, as they no longer need to rely on older logistics operations coordination methods like radios and spreadsheets. Featuring a loading dock dashboard, the Dok-Vu also allows managers to review current trends and historical data, so that they can identify potential improvements and make more data-driven decisions than they previously had. **Rite-Hite, ritehite.com.**



Operations decrease downtime with data-driven dock system

By interconnecting their equipment with the Cloud-based, data-driven Connect Digital Dock, warehouse and DC dock operations can acquire real-time access to an array of dock data and KPIs. As a result, operations of virtually any size and specialty—from cold storage, food and beverage, industrial and retail—will have full control over their entire processes, as they monitor their physical procedures and, in turn, make decisions based on data. Due to their data-based decisions, operations will be able to manage their operational costs and minimize downtime, waste and redundant work by detecting delays in turnaround time. A self-enclosed program, the Connect Digital Dock doesn't interact with existing networks and IT infrastructures, nor does it require any IT team assistance.

4SIGHT Logistics Solution, 4sightsolution.com.

Conveying system enhances loading and unloading processes

Through the Freight Runner dock-to-trailer conveying system, users are able to decrease loading and unloading times by upward of 80%. The system automates the entire loading and unloading process. Aside from reducing loading and unloading times at docks to less than 5 minutes (depending on the application that's used), the system also improves employee safety, especially in dock areas. Employees don't have to be in loading zones, leading to a lower fall risk (from dock edges), along with the virtual elimination of injury risk (from falling off of dock plates). In addition to enhancing employee safety, the system also decreases equipment and labor costs, as less employees will now be required for loading and unloading procedures. **Keith Manufacturing, keithfreightrunner.com.**



Adjustable gate protects products and users

Developed with patent-pending features and heavy-duty materials, the robust, counterbalanced EdgeSafe Loading Dock Safety Gate was designed for effortless, one-hand operation. Through its slam-proof dampening system (with no pinch points), the gate is able to not only protect products, it also protects users. In addition, the EdgeSafe Loading Dock Safety Gate also decreases the risk of falls from bays, docks and exposed edges when it's closed. OHSA-compliant, the adjustable gate offers two options: the LDSG-120-PCY (which fits standard 8 x 10-foot loading docks) and the LDSG-144-PCY (which fits 10 x 12-foot docks). Through this flexibility, users can improve productivity, product protection and safety on a wider range of docks. **PS Industries, psindustries.com.**

Portable, wireless restraint system secures trailers and communicates status

VERSACHOCK wheel chock wireless trailer restraint system provides a simple, cost-effective means of securing trailers to ensure a safe and productive dock operation. It features a wireless engagement function detects wheels at all ranges; no chock cabling or permanent structure is installed on the drive to secure the vehicle. Other highlights include aluminum extrusion construction with a clear hard anodized finish to resist corrosion; pivoting chock sensor arm with reduced storage profile that provides engagement detection; heavy-duty wheel trigger; 0.25-inch heavy-duty galvanized steel cradle for secure storage; stainless steel sawtooth anchor that prevents chock movement under wheel engagement; industrial sensor unit with extended range retroreflective all-weather beam; and a high-intensity, all-weather white LED wheel engagement light that communicates device status to the operator. **Kelley**, kelleydocksolutions.com.

Loading dock storage racks offer a solution for empty pallets

Over Dock storage racks store empty pallets in racks above loading docks. Two rack systems, in particular—the SK2000 and the SK3000—

have been developed to fit around nearly any loading dock door. Along with these systems, dock managers can use two over-dock racking products, which enable them to reduce the odds of



lift-truck impact: ceiling supported storage racks and single-leg storage racks. The ceiling supported storage racks don't have any floor level legs, which can restrict forklift traffic, while the single-leg storage racks' unique designs feature upright frames, along with single upright columns that clear users' door heights. **Steel King Industries**, steelking.com.

Barrier gate features personnel barrier and magnetic lock

An upgraded version of the BG Series Barrier Gate offers users two new options to improve overall safety and efficiency: an integrated personnel barrier and a magnetic lock. The optional personnel barrier was primarily developed to comply with the OSHA regulation of a 42-inch height above dock floors. The magnetic lock integrates with a majority of manufacturers' control panels to enable the BG Series Barrier Gate to be electrically sequenced into the operation of dock levelers, overhead doors and trailer restraints if properly equipped. This ensures the Barrier Gate will remain in position across the door opening until the restraint, door and leveler have all been activated as users choose. **ABC Docks**, aaronbradley.com.

Online software for loading dock analytics

Through iDock Connect, warehouse and DC managers can use online software for loading dock analytics. Upon installing the software, users can log into an online account from any device that has Internet connectivity. Afterwards, they can view visual reports that feature information regarding dock activity, along with loading and unloading efficiencies. In addition, the software can send users e-mail and text notifications concerning loading dock events like after-hours activities, maintenance that's overdue, and truck arrivals and departures. **Systems**, loadingdocksystems.com.

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Durable dock gates provide users easy accessibility

Offering an efficient barrier for employees and equipment that work near open dock doors, EdgeGard Dock Gates are easy to install, operate and access, as their design has



a cantilever action. When the gates are raised, they completely clear the opening, leading to unobstructed traffic flow, along with

maximum approachability. Once they're closed, the gates remain securely in place as they never move. Featuring a robust design, the gates are available in two options: straight-rail or folding-rail; the folding-rail option protects wider openings, while also decreasing required clearance heights. As long as they're anchored properly, the gates can meet the 200-pound OSHA 1910.23 load force protection requirement. **Wildeck**, wildeck.com.

New control panel is network integration ready

As a new generation of integrated dock equipment control, the Digital Master Control Panel offers a variety of features that were previously unavailable (from former dock control panels). In particular, it provides users a guided sequence of operations, along with a color and shape status light. Designed to be entirely network integration ready, the Digital Master Control Panel has no dependence on language. It also offers users an override, time-at-dock timer, on-board data and diagnostics, and password access.

Additionally, it features an intuitive human machine interface (HMI) screen, which can be fully tailored to operate numerous combinations of dock equipment, such as doors, levelers and restraints.

Sercos, sercodockproducts.com.



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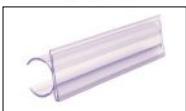
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Beckhoff EP7402 EtherCAT Box Offers Compact Conveyor Control

To enhance control and cabling efficiency for motor-driven roller (MDR) conveyor systems, Beckhoff Automation has released the new EP7402 EtherCAT Box. This compact controller is a two-channel motor output stage for BLDC motors used in MDRs, regardless of the conveyor or roller motor vendor. The EP7402 offers optimal conveyor control through zero-pressure accumulation (ZPA) logic in its firmware, programming in the TwinCAT 3 engineering environment and high performance EtherCAT industrial Ethernet communication.



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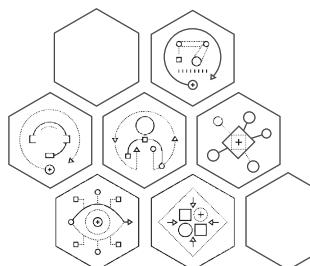
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Russ Meller

Fortna Inc.

TITLE: Vice president, solution design and research and development, Fortna Inc.

LOCATION: Louisville, Colo.



Modern: You've recently been elected to the National Academy of Engineering. Tell us a little about the recognition and what the academy does.

Meller: First, it's not something you know about in advance. I had an inkling that it might happen because I got a call from someone associated with the academy and was asked some very pointed questions about my work and career. But, it wasn't a typical nomination process. I was later notified by e-mail that I was going to be one of 87 new members and 18 international members. It was in recognition for contributions to large-scale distribution center design and operation. New members are inducted every two years, and this year's induction ceremony is scheduled for October 4 in Washington.

Modern: What does the academy do?

Meller: It's part of what is now called the National Academies of Sciences, Engineering, and Medicine. The National Academy of Sciences was set up in 1863 during Abraham Lincoln's first administration, and he thought it would be great to have a group of independent scientists who could advise the government on important matters. The original charter called for academy members to investigate, examine, experiment

and report on any subject of science or art when called upon by a department or agency of the government. That charter is still operational today. In the 1960s, the name was expanded and the three academies were established. We're called upon to take on the research challenges of the day. I'm sure there is a working group right now looking at Covid-19. After October, I'll be part of that.

Modern: What does this recognition mean?

Meller: What's gratifying to me is that the academy spans all of the engineering disciplines, and not just the field of materials handling. And, I have to say that I've been blessed with lots of opportunities in my life, and I feel very grateful.

Modern: Let's take a step back: How long have you been in the industry?

Meller: I started working for a consulting company back in 1988, and, well, you can do the math from there.

Modern: What have been the most significant changes you've seen over the last 32 years?

Meller: There are two, and they're related. The first is that labor is an absolute constraint on growth and the ability to meet service level requirements. The second is that there are vastly higher service level agreements, and some companies make it even harder on themselves during peak. One of the first questions we ask at the start of an engagement is: What's the promise you've made to your customers or retail stores?

The fact is a company can't look at labor alone to add the capacity it needs to keep those promises, but labor alone may not be enough to justify a system and meet financial goals. So, companies are getting creative in the way they justify automation. It could be that they can make better utilization of space and improve the ROI, or generate more revenue. Companies are making decisions like adding a sorter that is only used for shipping part of the year, but maybe they can use it for other processes the rest of the year. They're sharing the automation across the DC. That's a change.

Modern: We both just came back from Modex, where a lot of emerging technologies were on display. What are you watching?

Meller: Piece picking robots. We've made a lot of advances, and this is exactly the application for artificial intelligence and machine learning in the materials handling space. We're not yet at the phase where enough clients are willing to implement piece picking robots, but it's coming. And, I think the next area will be to put a piece picking arm on a mobile robot that can move around easily. We're pushing the frontiers on this, and it's where my attention is at right now. ■

Big Ideas



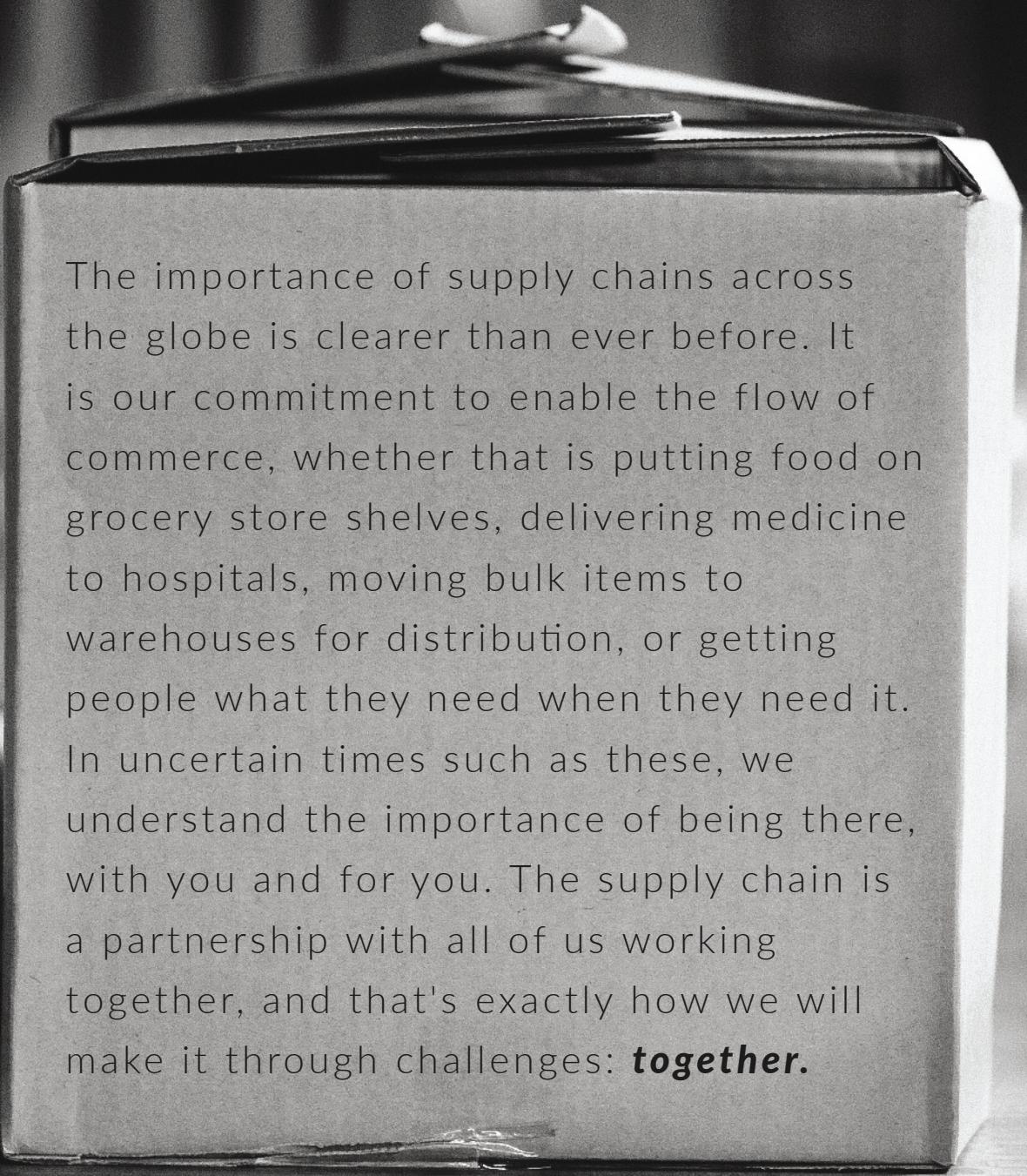
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