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July 2015

**Technology & Innovation**  
SPECIAL ISSUE

READER SURVEY

Software Usage  
Reader Survey **32**

SPECIAL REPORT

Top 20 SCM software  
suppliers **40**

BEST PRACTICES

4 new ways AGVs  
and carts support  
automotive **46**

EQUIPMENT REPORT

Lights, voice,  
action **52**

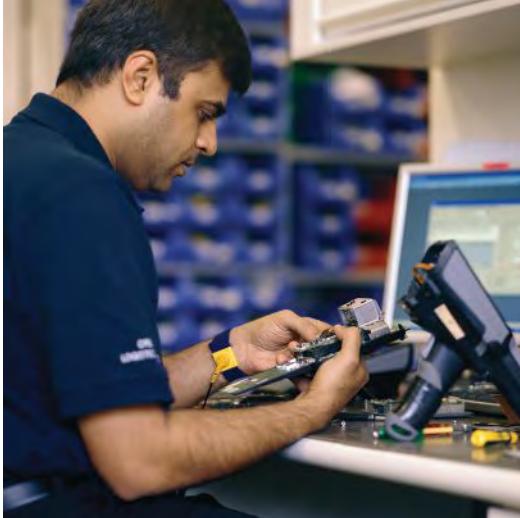
Craig Hayes, vice  
president of fulfillment  
for eBay Enterprise

**eBay: Speed,  
flexibility and cost** 18

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## CHEP and IFCO sponsor first-annual Reusable Packaging Forum

IN LATE APRIL, packaging professionals from around the country gathered in Chicago for a two-day forum focused on industry collaboration and solving the unique challenges related to reusable packaging.

CHEP, a pallet and container pooling services company, was one of several sponsors of the two-day event, providing the opening night reception in a joint effort with sister company IFCO. A diverse array of packaging suppliers were represented at the forum with poolers, 3PLs and plastics manufacturers, as well

as a mix of end users of returnable packaging.

"The collective expertise at the forum provided a unique opportunity for users of reusables to gain tips on cost reduction, creating leaner operations and really maximizing the benefits of their returnable packaging," said Chris Bomgaars, director of sales and marketing at the containers division of CHEP North America.



## Motion Control Association is now Motion Control and Motor Association

THE MOTION CONTROL Association (MCA) and SMMA-

The Motor and Motion Association, have completed a merger that combines the two leading trade groups serving the global motion control and motor industry. The new organization name is the Motion Control and Motor Association (MCMA).

SMMA was founded in 1975 and served motor and motion control manufacturers and material suppliers to those manufacturers. MCA began in 2006 and served motion control and motor manufacturers, distributors, system integrators, end users and affiliates. Combined, MCMA now serves the full supply chain from suppliers to manufacturers to distribution channels to end users.

"The strength of the larger organization will allow us to do even more to help promote the industry, and provide education and certification," said John Payne, the chairperson of MCMA and vice president of the Motion Division at Yaskawa America.



## Seegrid and Topper Industrial announce partnership

SEEGRID CORP., a leader in three-dimensional vision navigation, is partnering with Topper Industrial, a manufacturer specializing in industrial carts and other materials handling equipment, to provide vision-guided vehicles (VGVs) and cart-based materials handling solutions.

"Topper Industrial provides lean manufacturing and fork-free material handling solutions that increase automation and minimize touches in material delivery," said Chris Visnic, vice president of sales and services for Seegrid. "Our partnership provides VGV and cart-based solutions that work together to increase productivity, drive efficiency, and reduce labor costs for materials handling."

"With Seegrid's advanced technology and the ease of use of their vision-guided vehicles, Topper's industrial carts will track more accurately than before," said Ed Brown, CEO of Topper. "It will make forklift-free applications easier and more efficient."



## UPS study reveals industrial distributors' waning customer loyalty

INDUSTRIAL DISTRIBUTORS are facing changing market conditions that are challenging their long-standing business models, according to the UPS Industrial Buying Dynamics study, conducted by global research firm TNS.

The study revealed that buyers are increasingly willing to purchase outside of their existing supply base.



Representing input from 1,500 purchasing professionals, the survey illustrates the growth of direct-from-manufacturer purchasing, the demand for B2B e-commerce and the purchasing habits of Millennials as they become the next generation of purchasing leaders.

"Customer loyalty today is built on a different foundation than the one distributors have built over generations," said Brian Littlefield, UPS director of industrial manufacturing and distribution marketing. "Once price and quality standards are met, buyers are willing to explore vendors that better fit their needs, whether for a more convenient Web site, a better price or simply someone who quickly answers product questions."



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vice president  
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CHRIS CONE/GETTY IMAGES

**Technology & Innovation**  
SPECIAL ISSUE

## COVER STORY

SYSTEM REPORT

### 18 eBay: Speed, flexibility and cost

eBay Enterprise's Kentucky distribution campus puts a premium on flexible processes and absolute speed to the customer for e-commerce fulfillment.

### 28 The right automation for the job

## FEATURES

READER SURVEY

### 32 Software Usage Survey

Following heavy investment in 2014, many users of supply chain software have backed off from spending as they settle into their new systems. Nonetheless, the software market continues to steadily grow as concerns fall away.

SPECIAL REPORT

### 40 Top 20 SCM software suppliers

The market for conventional solutions continues to rise, even as innovative variations help the industry chart a new course.

BEST PRACTICES

### 46 4 new ways AGVs & carts support automotive

With operational flexibility and safety best practices guiding automotive manufacturing facilities, automatic guided vehicles and carts are now doing more than just bring components and kitted parts to lineside workers.

EQUIPMENT REPORT

### 52 Lights, voice, action

A look at what's new in voice, mobile and pick-to-light technology for today's warehouses and distribution centers.

mmh.com



60 seconds with...  
Bill Bastian Sr.,  
p. 106

## DEPARTMENTS & COLUMNS

3/ Upfront

7/ This month in *Modern*

14/ Lift Truck Tips: Power

16/ Packaging Corner: Cubing/Weighing

58/ Productivity Solutions

64/ Supplement: Warehouses/DCs

70/ Special Section: Corporate Profiles

100/ Focus On: MRO

105/ Product Showcase

106/ 60 seconds with...

## NEWS

9/ Talent shortage grows as a key risk for the manufacturing industry

10/ 2nd-annual National Forklift Safety Day: Bigger, better and safer

11/ Collaborative robotics market to exceed \$1 billion by 2020

12/ Engineering students devise new designs for roll-up doors

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## Working smarter

When *Modern's* editorial team returned from ProMat 2015 in late March, we quickly realized that the majority of our conversations on the show floor didn't revolve around the equipment as much as it did the software and supplemental technology designed to optimize systems in an effort to work "smarter."

In fact, working smarter through the appropriate application of technology has been a running theme in *Modern* over the last few years—so much in fact that we've dedicated one issue a year since 2012 to a deeper understanding of technology adoption levels as well as the role providers are playing in pushing the trends.

One of the most important building blocks of this special issue is our examination of *Modern's* "Software Usage Survey," our annual deep dive to gauge spending plans as well as how readers are putting supply chain software to work to improve operations (page 32).

And while we saw heavy investment in last year's findings, this year we found software spending backed off a bit—but that's not such a bad thing, according to John Hill, director at supply chain engineering firm St. Onge.

"Something is afoot," says Hill, "but I don't believe that it is a bellwether of a broad sector slowdown. We continue to see healthy activity in a number of areas, so it may simply be that companies are still in the midst of deploying the systems they purchased last year."

Associate editor Josh Bond, agrees with Hill, saying this year's findings point to a pause in spending, but reveal an acceleration in "data convergence." Bond says it's clear that end-users are looking to break down traditional silos and unify the warehouse, labor and transportation management systems that they just installed or

updated. "This effort will better optimize activities across functions that previously didn't communicate or work with one another. And while there's a long way to go, the proper integration tools have emerged and are being put to work."

The convergence trend and the need for "silo-free" collaboration in an omni-channel world is putting a spark into the numbers of this year's "Top 20 Supply Chain Management Software Suppliers" (page 40) as well.

According to Gartner, our research partner in this annual list, the market for supply chain management software, maintenance and services continued its growth in 2014, generating \$9.9 billion in 2014, a 10% increase over 2013 revenues—a number congruent with last year's user survey.

"The industry is in a replacement cycle, but we're also seeing supply chain capabilities spreading into places like retail stores," says Chad Eschinger, Gartner's vice president of supply chain. "The goal is improved collaboration across a broader platform, which can drive much higher levels of efficiency."

And while more users and providers are now working to fine-tune the connection with other elements across the supply chain, Bond adds that we're also seeing the evolution of a deeper understanding of how to achieve true technological innovation.

"The consultative, systems-based approach is drawing end-users and suppliers closer, building more trust," says Bond. "With that, users are telling us that we're seeing more appropriate amounts of technology and training being applied where needed—further building on the understanding that the advancing capabilities of technology alone will not meet all the challenges of the future."

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# NEWS & TRENDS

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## LABOR

# Talent shortage grows as a key risk for the manufacturing industry

**BDO STUDY HIGHLIGHTS RISKS FOR PUBLICLY TRADED U.S. MANUFACTURERS AS THE INDUSTRY STRUGGLES TO ATTRACT AND RETAIN ITS WORKFORCE.**

BY JOSH BOND, ASSOCIATE EDITOR

Although the manufacturing industry is in resurgence, concern over the industry's talent shortage is escalating, according to the third-annual "BDO Manufacturing RiskFactor Report."

An analysis of risk factors listed in the most recent 10-K filings of the largest 100 publicly traded U.S. manufacturers reveals that 98% of manufacturers mentioned risks related to labor concerns, up from 97% in 2014 and 75% in 2013.

In a recent interview, Rick Schreiber, partner, manufacturing and distribution at BDO, said that the continued economic resurgence means manufacturers are on an even economic footing.

"With increased stability, they're now focused on growth," Schreiber said. "However, the challenge remains to fill their talent pipeline. Although unemployment is generally down, when

you look specifically at the manufacturing world, the labor gap just continues to grow."

The challenge is compounded as talent on the factory floor and in the C-suite approaches retirement. It's estimated that by 2030, more than 20% of Americans are projected to be age 65 and over, compared with 13% in 2010 and 9.8% in 1970,

according to a recent study from the U.S. Census Bureau. Amid the retirement of leading innovators and strategists, 74% of manufacturers mentioned concerns around attracting, retaining and motivating key personnel and management, up from 69% in 2014 and 62% in 2013.

In an effort to combat the shortage, Schreiber said that more clients

are launching or expanding apprenticeship programs, partnering with community and technical colleges, or working on grassroots efforts to support science, technology, engineering and mathematics (STEM) education.

"The annual Manufacturing Day has been a great program for building awareness that manufacturing is still alive and can provide a good living," Schreiber said. "A lot of companies are participating in that initiative, which has been highly successful."



**The manufacturing sector is hit particularly hard despite shrinking national unemployment rates.**

## LIFT TRUCKS

### 2nd-annual National Forklift Safety Day: Bigger, better and safer

Last year, the Industrial Truck Association launched National Forklift Safety Day (NFSD) to widespread

praise and participation. On June 9, the second installment again included open houses across the

country and productive meetings with congresspeople in Washington, D.C., to promote the industry's emphasis on safety, operator training and education.

But even the event's sponsors at the Industrial Truck Association (ITA) could not have anticipated the gusto with which stakeholders dove into the mix.

"I've been in the industry for 26 years, and I've never seen so many lift truck manufacturers and competitors work together so enthusiastically," says Brett Wood, chairman of the ITA board of directors and president and CEO of Toyota Material Handling North America. "It's been special to see how we all dropped our business cards at the door and rallied around this initiative."

Wood says the primary objective is to raise awareness of the continued need for robust and ongoing operator training programs. Last year, he says, approximately 135 media channels, including *Newsday*, the *Miami Herald* and *Bloomberg News*, covered the event, representing a combined circulation exceeding 20 million people.

In Washington, D.C., the main event featured speakers including Jordan Barab, deputy assistant secretary of labor for OSHA; congressman Reid



National Forklift Safety Day included educational events hosted at dealers and manufacturing facilities across the country.



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Ribble (R-Wisc.), a U.S. representative with jurisdictional oversight over the Department of Labor; and lift truck industry representatives from Toyota Material Handling and NACCO Materials Handling Group. Visit [mmh.com](http://mmh.com) for complete coverage. □

director of robotics at ABI Research, collaborative robotic systems were developed in response to a number of pressing social drivers and business imperatives, and aided by ongoing technological innovation.

"The sector is very dynamic and is

expanding rapidly with new product offerings being released into the market from both established companies and smaller, emerging firms," Kara said. "Larger firms are actively acquiring smaller companies with proven technology." □

## ROBOTICS

### Collaborative robotics market to exceed \$1 billion by 2020

The collaborative robotics sector is expected to increase roughly tenfold between 2015 and 2020, reaching more than \$1 billion from approximately \$95 million in 2015, accord-



**Collaborative robots are expected to support competitiveness for small- to medium-sized manufacturers.**

ing to a new study published by ABI Research entitled "Collaborative Robotics: State of the Market/State of the Art."

The growth will be fueled by three key markets: electronics manufacturers and electronics manufacturing services companies, small- to medium-sized manufacturers, and manufacturers seeking robotic solutions optimized to support agile production methodologies.

According to Dan Kara, practice

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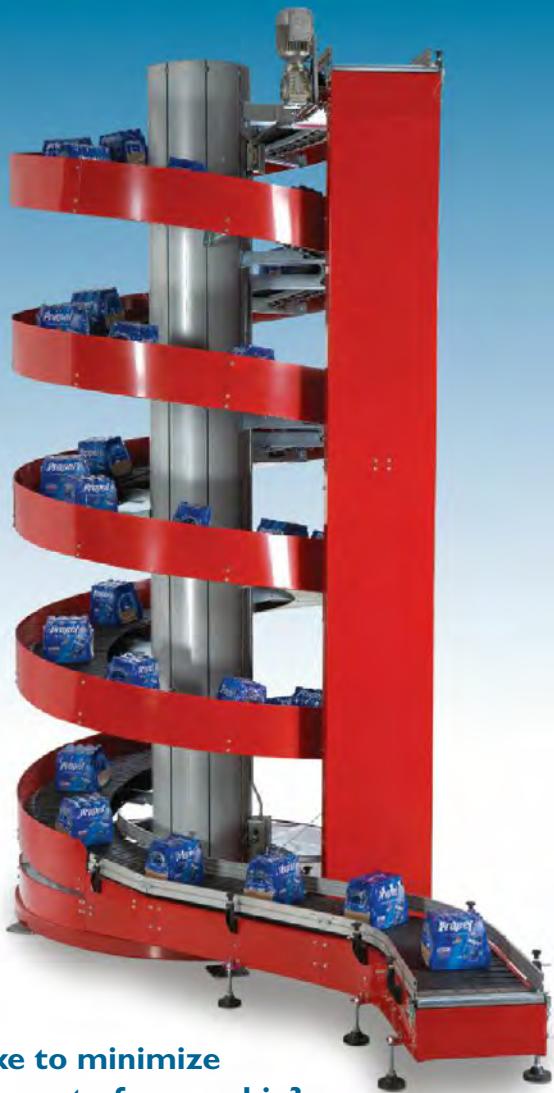
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## NEWS&TRENDS

### EDUCATION

## Engineering students devise new designs for roll-up doors

More than 80 senior projects at the Milwaukee School of Engineering (MSOE) were recently on public display at its campus, ranging from a solar-powered garden irrigation system to a high-speed overhead door.

The projects represented months of work by teams of students who, in some cases, collaborated with area companies to solve a problem or come up with a better solution. Team members Marcelo Alves, Jesus Arguelles



Team members Marcelo Alves, Jesus Arguelles Chavira, Eric Fredericksen and Assad Rashwan of the Milwaukee School of Engineering.

Chavira, Eric Fredericksen and Assad Rashwan redesigned a Rytec high-speed roll-up door.

The doors have electronic safety sensors and communication systems that are powered using replaceable batteries or a power cord. The students developed a wireless charging system that replaces the batteries or cord with a capacitor, which stores electricity like a battery, and has power transferred to it without wires.

The changes could be significant for Rytec, said Jeff Malinowski, director of engineering.

"There are some advantages to working with undergraduates, because after you've been in the industry for a while you tend to get tunnel vision or just become accustomed to how things are done," said Malinowski. "If you bring in somebody new, whether they're fresh out of school or a student, they ask a lot of questions. And in many cases, it makes you take another look at what you're doing." □



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## The powerful impact of battery management

*Per-unit and per-operator fleet management practices continue to improve fleet efficiency, but many overlook opportunities to manage costs on a per-battery basis.*

By **Josh Bond**, Associate Editor

Lift truck users are working to get a better handle on energy costs and the right mix of equipment in the pursuit of improved efficiency. Fleet management solutions and practices have helped control costs by collecting metrics on each lift truck and each operator, but many have yet to address one key component.

"Ten years ago, most fleet owners didn't know where the lift trucks were or how each of them was cared for," says Jim Gaskell, director of Global Insite Products for Crown Equipment. "What's still being overlooked is the battery itself. We're now seeing a push for visibility into the battery so it can be managed as its own asset."

Traditionally, battery replacement schedules might have been based simply on the age of the batteries, Gaskell says, or a salesperson might convince a customer to entirely replace the battery inventory. "It was based on virtually no data," he says. "You can't optimize maintenance costs and operator costs if you have battery abuse that results in downtime."

Some battery management solutions focus on monitoring the batteries while they're plugged in, ensuring proper charging and cooling cycles. Gaskell says a better way to manage batteries is to look beyond the limited data checkpoints of the battery room and instead collect real-time information about the battery as it's used.

"When you measure battery status on the floor, you can see its health, water levels, temperatures and which operator did or didn't properly charge it," Gaskell says. "Since the system is tracking each battery, you can very quickly inform operators and management to optimize that equipment."

For a given user of 100 batteries, if the system identifies that 30 of them are nearing the ends of their lives, the user can plan for targeted replacement. "You will know that a specific battery, independent of what lift truck or user it's paired with, only lasts two to three hours per



charge," Gaskell says. "Alternatively, you might learn an operator is bulldozing, or pushing several pallets on the floor, which puts tremendous strain on the battery."

An operator can do a lot of things to impact battery health, Gaskell says, and it's best to identify and address any issues quickly before they become much bigger problems. As lead-acid battery costs have skyrocketed, there's incentive to extend their lifespan, reduce inventory and consider alternatives like lithium-ion.

"Whatever solutions customers use, the technology to monitor a battery will continue to be essential going forward," adds Gaskell. "Whether lithium-ion or lead-acid, the ability to track each asset is important for the future."

---

*Josh Bond is Modern's associate editor and can be reached at [jbond@peerlessmedia.com](mailto:jbond@peerlessmedia.com)*

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## Automated dimensioning: Beyond dim weight compliance

*Today's sensors can capture information that not only can be used to realize cost savings from streamlining operations and minimizing waste, but also improve customer satisfaction.*

By Sara Pearson Specter, Editor at Large

Now that dimensional weight (dim weight) shipping charges assessed by UPS and FedEx for all packages have become reality, small parcel shippers have expanded their use of dimensioning equipment to capture the length, width and height of their packages—in addition to weights.

There are a number of ways to measure items upon receipt and prior to shipment, including manually with tape measures or by placing an item on a dimensioning machine (either static or portable).

More recently, however, there's been an evolution in the implementation of automated, in-motion dimensioning equipment within shippers' distribution centers, says John Ashodian, marketing manager for intralogistics at SICK. The automated equipment uses sensors to capture item measurements as products and parcels travel past on conveyors.

"Previously we saw most of these implementations at carrier hubs. Now, we're seeing them move inside the walls of retailers' and e-tailers' facilities," Ashodian explains.

The advantage of capturing item volume measurements goes beyond avoiding carrier chargebacks for inaccurate shipment information, Ashodian says. "Internally, the information that's gathered can be used to provide more value than just calculating shipping costs more accurately," he says. "It can also be used to make internal processes more efficient."

From a functional perspective, integrating a dimensioner, weigh scale and bar code scanners with a conveyor, which can transport items at speeds of 500 feet per minute (or faster), captures and transmits the data in real time for better



transparency and visibility into the supply chain, he says.

Data collected from the automated capture of inbound product dimensions can be used to improve product identification and storing processes; help identify damaged cartons; match items to the optimum outbound shipping carton size; and even load trailers for maximum transportation density.

"These sensors capture a lot of information that can not only be used to realize cost savings from streamlining operations and minimizing waste, but also to improve customer satisfaction," adds Ashodian. "Ultimately, retailers are looking to leverage technologies to ensure that every single customer's experience is the best it can be."

---

Sara Pearson Specter is an editor at large with Modern and can be reached at [sara@saraspecter.com](mailto:sara@saraspecter.com).

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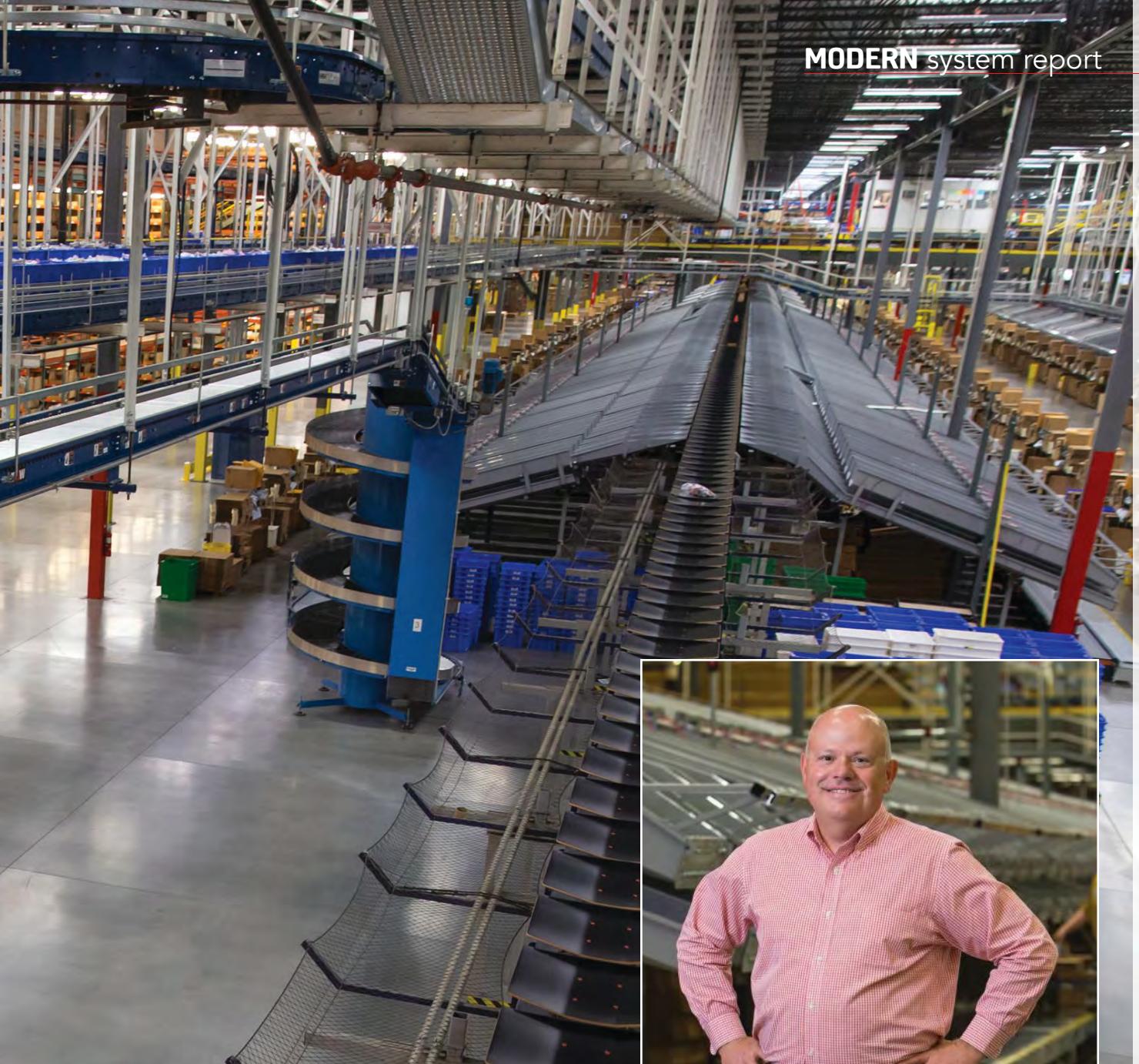
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# eBay: Speed, flexibility and cost

eBay Enterprise's Kentucky distribution campus puts a premium on flexible processes and absolute speed to the customer for e-commerce fulfillment.

By Bob Trebilcock,  
Executive Editor



Chris Cone/Getty Images

**Craig Hayes, vice president of fulfillment for eBay Enterprise, says the Kentucky distribution campus features very little storage because the facilities are focused on fast and flexible order fulfillment, not warehousing.**

**M**ost of us think of storage as one of the five processes common to every warehouse, along with receiving, picking and packing, replenishment and shipping.

That's not the case at eBay Enterprise's Richwood Fulfillment Center located just over the Cincinnati border in Walton, Ky., according to Craig Hayes, the vice president

of fulfillment. There, storage is really a replenishment function, since the vast majority of newly received merchandise is put away into bins and delivered directly to a forward pick location. The reason is that Hayes isn't running a warehouse: He's running an e-commerce distribution center for retailers and e-tailers. "Forecasting is critical," Hayes says. "Our goal

is to work with our clients to accurately forecast so we only receive the products they plan to sell and ship within the next several months.”

In fact, the Richwood Fulfillment Center is really a fulfillment campus. It consists of two facilities with a combined 1,175,000 square feet. One is highly automated, featuring four levels of mezzanine and a high-speed induction and shipping tilt tray sortation system (Intelligrated, intelligrated.com) to handle high-volume, flat apparel. It's complemented by put-to-light technology for products that are less automa-

tion friendly. Those are picked to totes and conveyed to a light-directed put wall for sortation into orders. The other facility is a highly flexible fulfillment center that handles everything from pet and consumer electronics products to odd-shaped sporting goods such as kayaks and golf clubs. In its four-level mezzanine, orders are batch picked to carts and totes that are delivered manually or conveyed to put-to-light stations.

While the facilities may take different approaches to fulfillment, they were designed with a common philosophy that processes should be flexible, speedy and cost effective. For example, 85% of the orders from the campus ship the same day they are received and 90% are delivered to the customer in three days—the average is 2.37 days in transit. “Our whole fulfillment concept is flexibility and speed, from the time an order drops until it reaches the customer’s doorstep,” Hayes says. He adds that the company also has a

strong focus on cost efficiency and a lens toward sustainability.

### From garage sales to omni-channel fulfillment

Say “eBay,” and many may think of the e-commerce auction site once famous as a sort of online yard sale for the unused items taking up space in our basements, attics and garages.

But today, the company has moved well beyond those roots. eBay remains an iconic Internet brand; meanwhile eBay Enterprise, which is headquartered in King of Prussia, Pa., and was acquired by eBay in June of 2011, provides a total e-commerce solution to e-tailers and brick-and-mortar retailers that don't want to invest in their own each fulfillment.

Formerly known as GSI Commerce prior to the acquisition, eBay Enterprise provides not only pick, pack and ship solutions, it can also develop a retailer's Web store, execute e-mail marketing campaigns, manage credit and payment services, provide customer service, perform value-added services before the order goes out the door and handle returns.

More importantly, the company operates in an omni-channel world. “If a customer in Denver orders a sports jersey for delivery the next day, our algorithm can determine the best ship from location, including pick and ship from a store,” Hayes says. “The focus is absolute speed.” Through its value-added services, the package shipped from eBay Enterprise will be branded just like a package shipped from the store. “We maintain our clients' brand experiences. The end customer doesn't know whether it came from the store or our center in Kentucky,” Hayes adds.

The Richwood campus is part of a larger global network that includes a total of nine campuses worldwide, and comprises more than 7.5 million square feet of space allocated for order fulfillment solutions in the United States, Canada and Europe. In 2014, the net-



**Newly received inventory is cubed and weighed and placed on carts that are delivered to the right mezzanine level by vertical reciprocating conveyors. Bins are then put away in pick locations.**



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work shipped 174 million units while Richwood ships as many as 350,000 units per day during the peak season.

Both buildings were greenfield facilities. At 543,000 square feet, the first building went up in 2007 and was dedicated from the start to handling apparel. Located two days by ground transportation to the East Coast and four days to the West Coast, geography also played a major role in the location.

The second, larger facility was completed in 2014. The primary catalyst was the need for more space. In addition, eBay Enterprise wanted a facility designed to handle a wider range of products. “We were at capacity in the original building,” says Hayes. “And, we wanted to stay here because we had a highly motivated local management team, a great workforce and a very positive experience with the local community.” Today, the campus manages e-fulfillment for 10 different customers.

### Speed and flexibility

When it came to the design of the facilities, eBay Enterprise faced the same question as any other third-party logistics (3PL) provider: When does automation make sense?

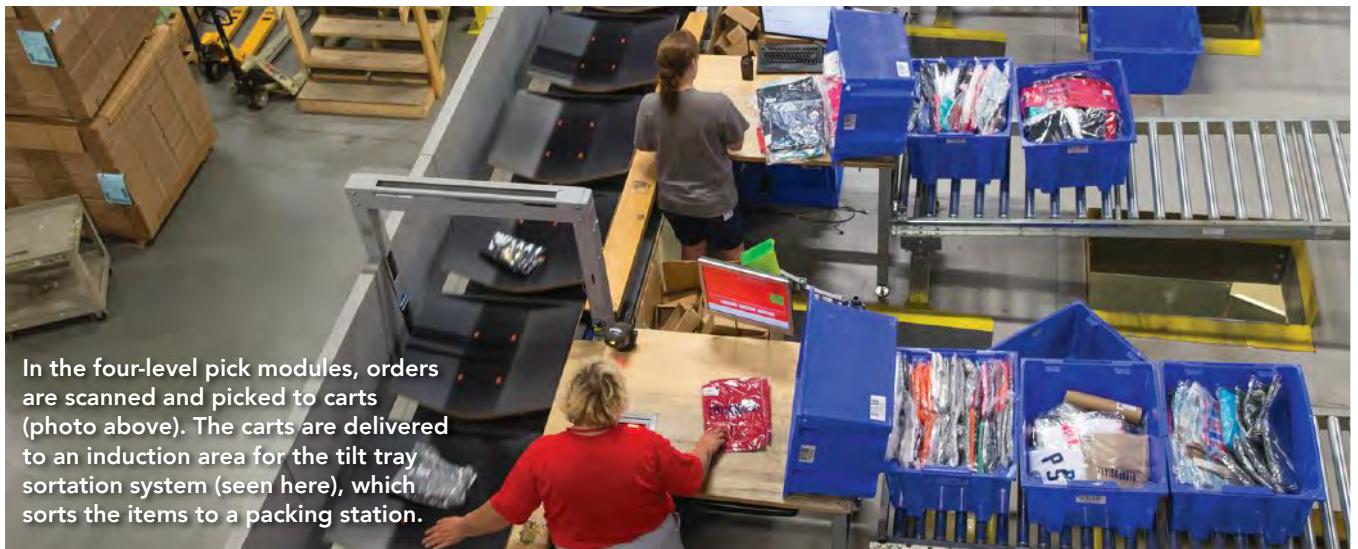
There are any number of automated goods-to-person picking solu-



tions on the market, such as shuttles, mini-load automated storage and retrieval systems (AS/RS) and horizontal carousels. However, for a 3PL, the capital investment in those solutions can be substantial and limiting. “We have clients who come to us with a three- to five-year horizon,” says Hayes. “After the contract ends, the next client may have a different product line and a different number of SKUs to manage. We believe that

when you put in automation, you box yourself in on the SKU count.”

For that reason, the facilities were designed with flexibility and speed in mind. For instance, while the first facility features a large tilt tray sortation system, it was designed to meet the needs of two specific clients with flat tagged and bagged apparel products. “The tilt tray offered the best value to handle that product,” Hayes says. The tilt tray system also offered a



In the four-level pick modules, orders are scanned and picked to carts (photo above). The carts are delivered to an induction area for the tilt tray sortation system (seen here), which sorts the items to a packing station.

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Items are conveyed to a light-directed put wall area where orders are placed in cubbies on one side of the put wall (left) and then packed for shipment on the other side of the put wall (right).



very speedy way to fill orders once they dropped into the facility's warehouse management system (WMS). "About 85% of the orders in that facility ship the same business day, and we ship seven days a week," Hayes says.

However, when it came time to expand the product lines to larger and bulkier apparel items, eBay Enterprise used tote picking and conveys those totes to a light-directed put wall area.

Similarly, the second building was designed with a four-level mezzanine

and put wall solution from day one because of the variety of products handled in the building—everything from pet supplies to golf clubs. "We're using RF-directed batch picking to a tote in the mezzanine that is then put on a conveyor to the put-to-light area," Hayes says. There, lights direct associates on one side of the wall to place items in a specific cubby. When all the items for that order are in a space, a light on the

other side of the wall alerts a packer that the order is ready to process for shipping. "With a mezzanine and put wall, it's fairly inexpensive to add more bin space or another cubby if the business changes," Hayes says.

The two facilities are also managed for flexibility. With 10 different customers, and a variety of product lines, there are times when one building may be slow while the other is operating at maximum capacity to manage a special promotion. "It is not uncommon for us to move skilled labor from one building so that we can scale up or down very quickly," Hayes says. (See box, "Operating at peak.")

While both facilities feature RF-driven picking today, Hayes says that eBay Enterprise plans to install voice-directed picking, which is already being used in other eBay Enterprise fulfillment facilities, to increase speed and accuracy.

### Operating at peak

Retail distributors have always had to cope with seasonal peaks. Those are fairly predictable. A DC manager may not know exactly how much volume will flow through a facility during back-to-school or the holiday season, but prior year sales are a good indicator. E-commerce not only has those seasonal peaks, it also has peaks within a week or even within a shift because of changes in the way customers place orders online.

That comes as no surprise to Craig Hayes, vice president of fulfillment for eBay Enterprise. "Orders are coming in on the weekends, during lunch breaks and in the evening after dinner," Hayes says. "We've been staring at the trend for about four years, and believe we have that dialed in."

One of the strategies already mentioned is to move skilled team members from one process, or even one building, to another when one area is hot while another is cool. Beyond that, he adds, eBay Enterprise spends a lot of time analyzing how customers order by product line.

He then staffs different areas of the facilities accordingly. For instance, because Sunday afternoon is a popular day to place orders, the shipping area is fully staffed on Mondays, including the evening shift. Some clients' customers don't place orders until mid-morning during the week. For those, a shift might start later in the day. "It's all geared around hitting the speed, flexibility and cost metrics we set for the facility," Hayes says.

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### Speed and cost

At the Richwood campus, fast and flexible fulfillment doesn't stop at the dock door. Transportation management is also critical to the campus' operation. The facility was chosen for its proximity to both coasts, but also for its proximity to

parcel shipping hubs beyond Louisville and Memphis. "We measure speed inside and outside the box," Hayes says. "Inside the box, we measure how quickly we can fill an order and get it out the door. Outside the box, we measure how quickly we get it to the consumer's doorstep."

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Sealed and labeled boxes are conveyed and sorted to a shipping lane.

That's because eBay Enterprise's central location allows it to bypass Louisville, or even Memphis, and make a direct truckload line haul to another location, like a distribution hub serving Chicago, that will lower the overall transit time and control ever-rising e-commerce transportation costs.

And now that parcel carriers have instituted new pricing based on a package's dimensions, eBay Enterprise is paying close attention to the size of the cartons going out the door. "We spend a lot of time weighing and cubing inbound inventory and optimizing the sizes of our boxes," Hayes says. "When an order drops into our WMS, it cartonizes prior to the waving process, finding the 'best fit' carton for that order."

Upon ship confirmation, the WMS picks the smallest box for that order. In addition, the company has installed an on-demand box making process for low-volume products. "One of our goals is to be an environmentally friendly company," Hayes says. "When you ship 40 million packages a year, corrugate is an important part of that effort." Any reductions in corrugated help meet sustainability goals as well.

As the e-commerce world evolves, Hayes believes that eBay Enterprise is positioned to meet the needs of its customer base. "It's competitive out there," he says. "But with this campus, we have the solution in a building that allows us to quickly flex up or down to meet the needs of our clients while providing a great consumer experience."

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# The right automation for the job

Tilt tray sortation, RF picking and a light-directed put wall are the tools that speed orders out the door at eBay Enterprise's Kentucky fulfillment centers.

eBay Enterprise operates two distribution centers on the campus of its Richwood Fulfillment Center in Kentucky. One facility distributes high-volume apparel, including flat apparel that is processed through a tilt tray sortation system, while the other facility handles a wider variety of products—everything from pet products to electronics to sporting goods. Both buildings provide third-party order fulfillment services for retailers and e-tailers. Here's how products move through the apparel handling facility.

**Receiving:** Receiving is designed to handle a variety of deliveries, including small parcel, palletized LTL shipments and floor-loaded

shipping containers from Asia. Once product is unloaded, it is received against an advanced ship notification (ASN) in the warehouse management system (WMS). New stock keeping units (SKUs) are weighed and cubed to determine the best size bin or container for storage and shipping. Product is then tagged with a bar code label and placed in a storage bin. Bins are placed on a trolley used for replenishment.

**Storage:** Since reserve storage is at a minimum, the vast majority of product is put away into a forward pick location. Once an associate scans a bar code label on the trolley, they are directed by the WMS to the right location in the pick mezzanine. Putaway is confirmed by scanning the tote and the label for the pick location. Associates access the different levels of the mezzanine with a vertical reciprocating conveyor, or lift.

**Picking:** eBay Enterprise uses a robust waving process to direct picking. The system can create waves based on a number of criteria, including by zones, clients and order type (hazardous materials, gift wrapping), and by single SKUs or multiple SKUs. It can also optimize picking based on inventory coming into the facility and on the best utilization of labor and equipment, including automated systems.

**Single SKU waves:** A wave created for picking a

## eBay Enterprise Richwood Fulfillment Center Walton, Kentucky

**SIZE:** 1,175,000 square feet across two facilities

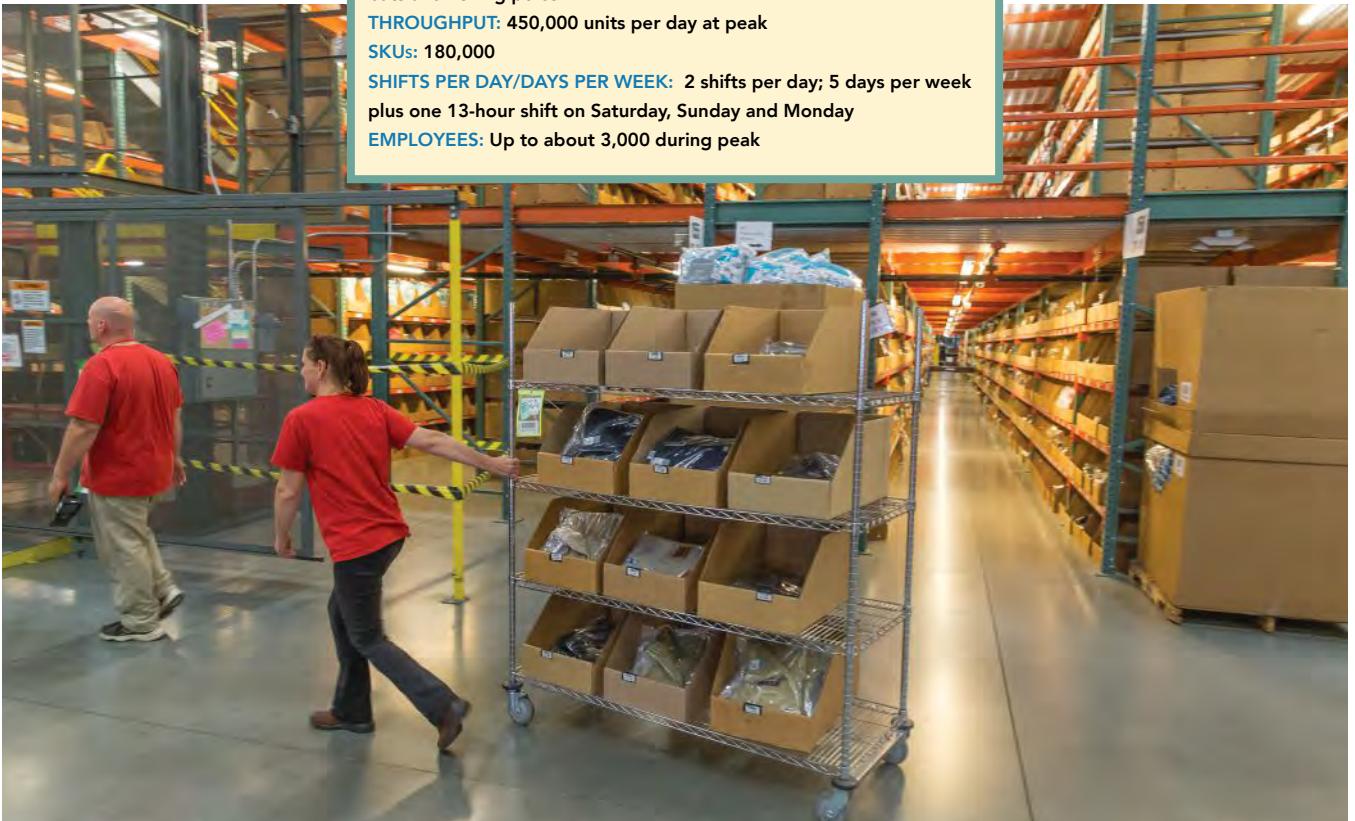
**PRODUCTS:** High-volume apparel, pet products, general electronics and sporting goods ship alone such as kayaks, golf clubs, baseball bats and fishing poles

**THROUGHPUT:** 450,000 units per day at peak

**SKUs:** 180,000

**SHIFTS PER DAY/DAYS PER WEEK:** 2 shifts per day; 5 days per week plus one 13-hour shift on Saturday, Sunday and Monday

**EMPLOYEES:** Up to about 3,000 during peak



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single SKU could be driven by a client running a promotion on a select group of products that results in several thousand orders of one SKU. Those orders are picked in mass in the four-level mezzanine. Once picked, the totes are delivered to the put wall area

for processing and packing.

**Multiple SKU waves:** The average multiple SKU order consists of two to three lines per order. Associates are directed by RF in the four-level mezzanine to pick multiple orders to a tote. Once all of the items for a group

### System suppliers

**TILT TRAY SORTATION:** Intelligrated  
**CONVEYOR:** TGVW  
**VERTICAL RECIPROCATING CONVEYOR/  
LIFT:** Wildeck  
**MOBILE COMPUTING:** Motorola Solutions  
**PUT-TO-LIGHT:** Lightning Pick  
**LIFT TRUCKS:** Crown Equipment  
**PALLET RACKING AND PICK MODULES:**  
Interlake  
**MEZZANINES:** Wildeck  
**WMS:** JDA/RedPrairie and Manhattan  
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**WAREHOUSE CONTROL SYSTEM:** Pyramid  
**TRANSPORTATION MANAGEMENT SYSTEM:**  
Kewill  
**CUBING AND WEIGHING:** Cubiscan  
**ON-DEMAND PACKAGING:** Packsize

of orders have been picked, the tote is placed on a takeaway conveyor. Totes with flat apparel are directed to the tilt tray sortation area. Larger or irregular items are conveyed to the put wall area.

**Packing—Put wall:** Associates scan items as they are removed from the tote. The put-to-light system directs them to the right cubby location for that item in the put wall. Once all of the items for an order are in a cubby, a light on the other side of the put wall turns green, alerting a packer that the order is complete. The packer places the item and any shipping materials in a shipping container.

**Packing—Tilt tray sorter:** In the induction area, items are removed from the tote, scanned and inducted onto the tilt tray. They drop into a chute for a packing station. There, items are placed in a shipping container. After dunnage and the packing slip are added, the container is automatically sealed, labeled and weighed to ensure that the right product is in the right box based on the information captured by the cubing and weighing system when it was received.

**Shipping:** Once orders have been packed, labeled and confirmed, they are sorted to the right area for shipping based on the shipping strategy for their zip code. □

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# 2015 Software Usage Survey

# The pursuit of

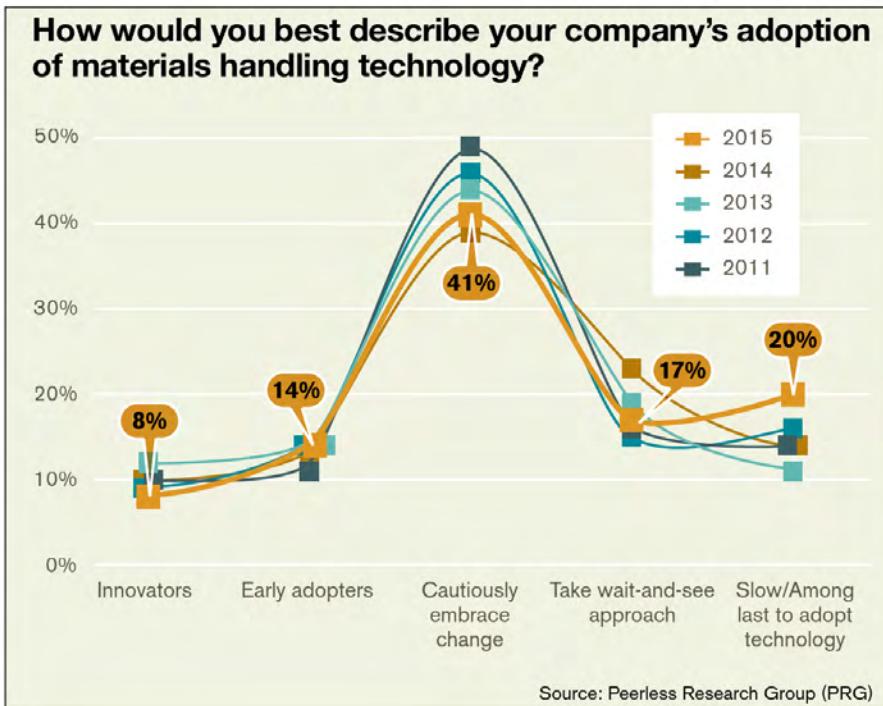
Following heavy investment in 2014, many users of supply chain software have backed off from spending as they settle into their new systems. Nonetheless, the software market continues to steadily grow as concerns fall away.

By Josh Bond, Associate Editor

The journey of supply chain software has seen more hills than valleys in recent years as competitive pressures spur adoption of modern, integrated platforms. Having installed or updated warehouse management, labor or transportation systems, users and suppliers of all sizes are now looking to unify these systems.

“Suppliers’ focus is extending beyond the four walls, and many are putting money into providing more than just excellence in warehousing and distribution,” says John Hill, director at St. Onge Company. “From their purview of materials management, they are now fine-tuning the connection with all the other elements of the supply chain.”

This is one of the many trends outlined in *Modern’s* “2015 Software Usage Survey,” conducted in May 2015. To better understand how readers use supply chain software to optimize their warehouse and distribution operations,



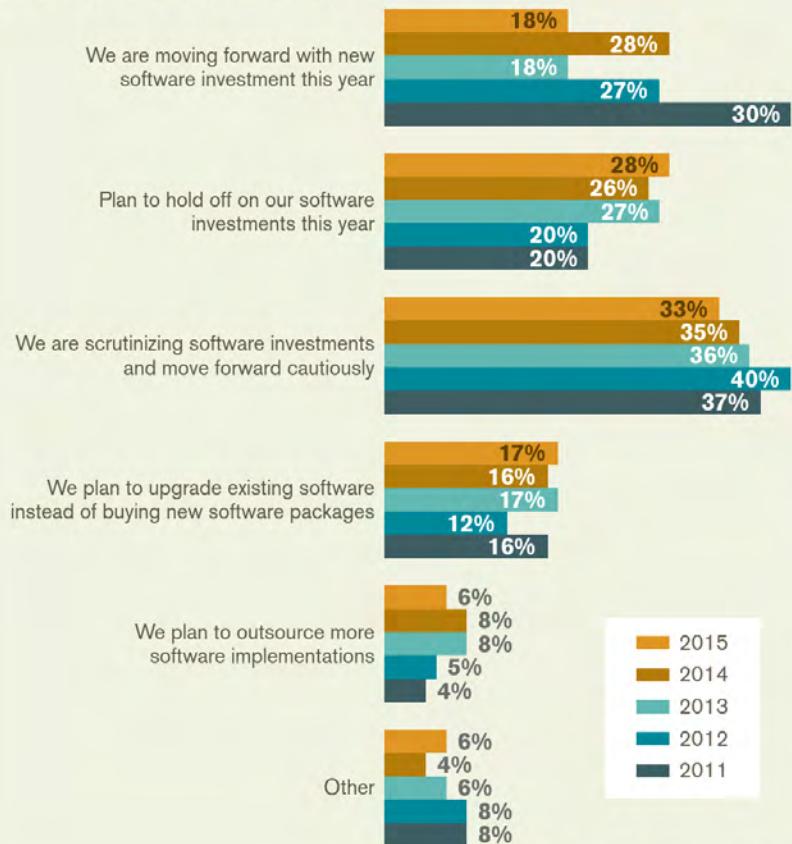
# supply chain compatibility

Peerless Research Group (PRG) surveyed subscribers of *Modern* as well as a sample of recipients of our e-newsletters.

The survey results reflect the experiences of those who are using software applications and those who are planning to invest in new solutions. The numbers reflect two main camps, according to Judd Aschenbrand, PRG's director of research. "Last year, 28% of respondents said they were moving forward with investments, and now it's 18%," he says. "At the same time, the average spend is up to almost \$700,000, which suggests some companies are moving very aggressively and others aren't."

Both groups share a continued decrease in concerns over the obstacles to a successful software implementation. "The overall decline here is encouraging and suggests supply chain systems convergence and improved integration tools are beginning to make their mark," Hill says. "Of course, there's still a lot more work to be done."

**How has the current economic climate changed your company's approach to adopting materials handling management software?**



Source: Peerless Research Group (PRG)

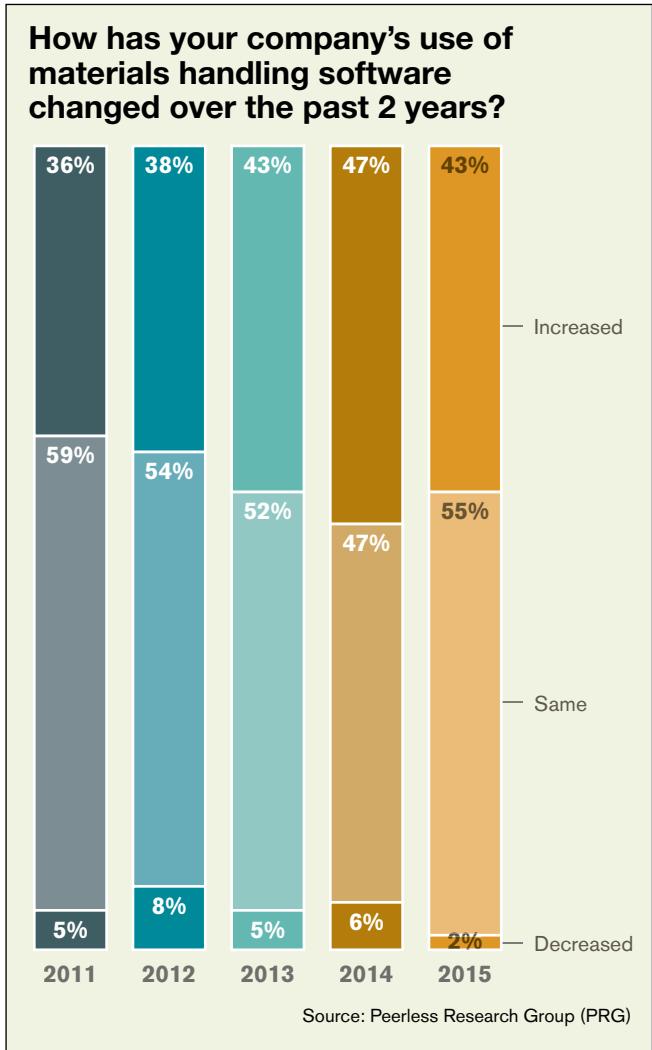
**Innovators and investigators**

The survey reflects the plans and perspectives of 192 qualified respondents. Overall, one in five respondents feels his or her company is slow or among the last to adopt information technology solutions. This is the highest number in the last five years, and is mirrored on the other side of the bell curve by a growing percentage of companies who consider themselves early adopters.

Hill notes that the combined number of those who wait or are slow to adopt is nearly 22% higher than the average percentage seen from 2011 through 2013. At the same time, the percentage of innovators and early adopters has been trending down since 2013.

“Something is afoot, but I don’t believe that it is a bellwether of a broad sector slowdown,” Hill says. “We continue to see healthy activity in a number of areas, so it may simply be that companies are still in the midst of deploying the systems they purchased last year. We saw the same thing in the 2012 to 2013 period.”

Going forward, respondents anticipate a brief lull in their software outlays. More than half (53%) plan to hold off on investments in the coming year, representing double the percentage in any of the survey’s previous four years.



nearly double any results from previous years, when it hovered in the upper 30s.

For those prepared for an outlay, not quite half expect to spend less than \$100,000 in the next year, a quarter will spend between \$100,000 and \$500,000, and almost one in 10 anticipate supply chain software spending of more than \$2 million. This year’s average spending is therefore up to \$679,000, a slight increase from last year, but a full 73% above the average spend in our 2012 survey.

The rising average may in part be explained by an increase in the number of survey respondents from large companies. Last year only 17% of respondents represented companies with annual revenues above the \$1 billion mark; this year, 26% are at least that big, bumping the average annual revenue of respondents to \$681 million.

**Usage of software applications**

Roughly three out of five respondents are currently using a warehouse management system (WMS), while warehouse control system (WCS)

But the number who report they are evaluating potential investments and moving forward cautiously (64%) is also

respondents are currently using a warehouse management system (WMS), while warehouse control system (WCS)

**“Suppliers’ focus is extending beyond the four walls, and many are putting money into providing more than just excellence in warehousing and distribution. From their purview of materials management, they are now fine-tuning the connection with all the other elements of the supply chain.”**

—John Hill, St. Onge Company



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users held firm at 29%. Among the more than half who plan to buy new WMS software, objectives include improved

inventory deployment (36%, up from 26%), real-time control (34%, up from 26%), and labor management functionalities (again 25%). Roughly 54% intend to upgrade existing solutions, the same as last year.

year's 39%. Fewer respondents are using software to manage order management (48%, down from 64%) and vendor/supplier collaboration (38%, down from 50%).

As companies plan to buy or upgrade their supply chain management software applications, they're aiming primarily for improved inventory visibility (50%) and demand planning (50%). Pending initiatives in procurement, (44%), order management (42%) and supplier/vendor collaboration (34%) are relatively unchanged. The percentage of respondents planning to upgrade an existing system of any kind also remains at 38%.

A new category this year, fleet management software is at work for one in

## Respondent demographics

Modern's annual Software Usage Study collected responses from 192 qualified individuals. To qualify, respondents must be personally involved in using, evaluating or purchasing software for their company's materials handling operations.

This year's respondents reflect management at all levels across both manufacturing and non-manufacturing vertical industries. Upper level management, meaning vice presidents, general managers and division managers, accounts for 30%, while 48% are responsible for managing their company's logistics distribution, warehouse, supply chain, operations or purchasing functions.

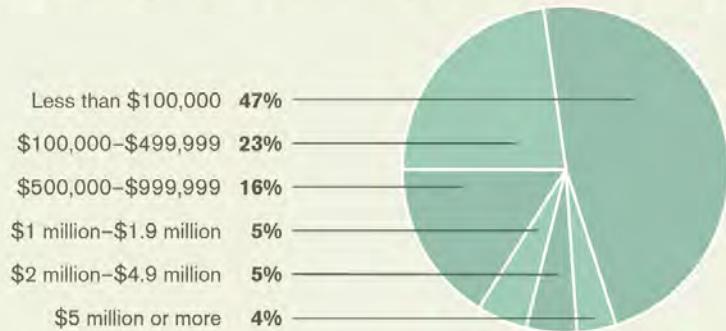
A number of vertical markets were represented, including food and beverage (14%), computers and electronics (7.6%), chemicals and pharmaceuticals (6.4%), automotive and transportation (5.7%), and industrial machinery (3.2%). On the non-manufacturing side, wholesale trade (11.5%), transportation/warehousing services (7%), retail trade (5.1%) and third-party logistics providers (3.2%) were among the respondents.

Last year, 16.7% of the companies reported annual revenue of more than \$1 billion. This year it's 26%, roughly the same amount who reported revenues less than \$10 million. The median revenue for 2015 is \$89.5, up from \$81.8 million in 2014 and \$70 million in 2013. The upward tick in median revenue represents the fact that more medium- and large-sized companies responded to the survey.

Readers already using supply chain management software identified the seven most important initiatives for their current needs. Demand planning (66%) leapfrogged inventory visibility (62%), cited by 10% fewer respondents this year. Procurement (60%) is holding steady as is collaborative forecasting, planning and replenishment (52%).

Those companies employing manufacturing software make up 54% of respondents, up sharply from last

## Approximately how much will your company spend on supply chain software for your operation including license, integration and training in the next 12 months?

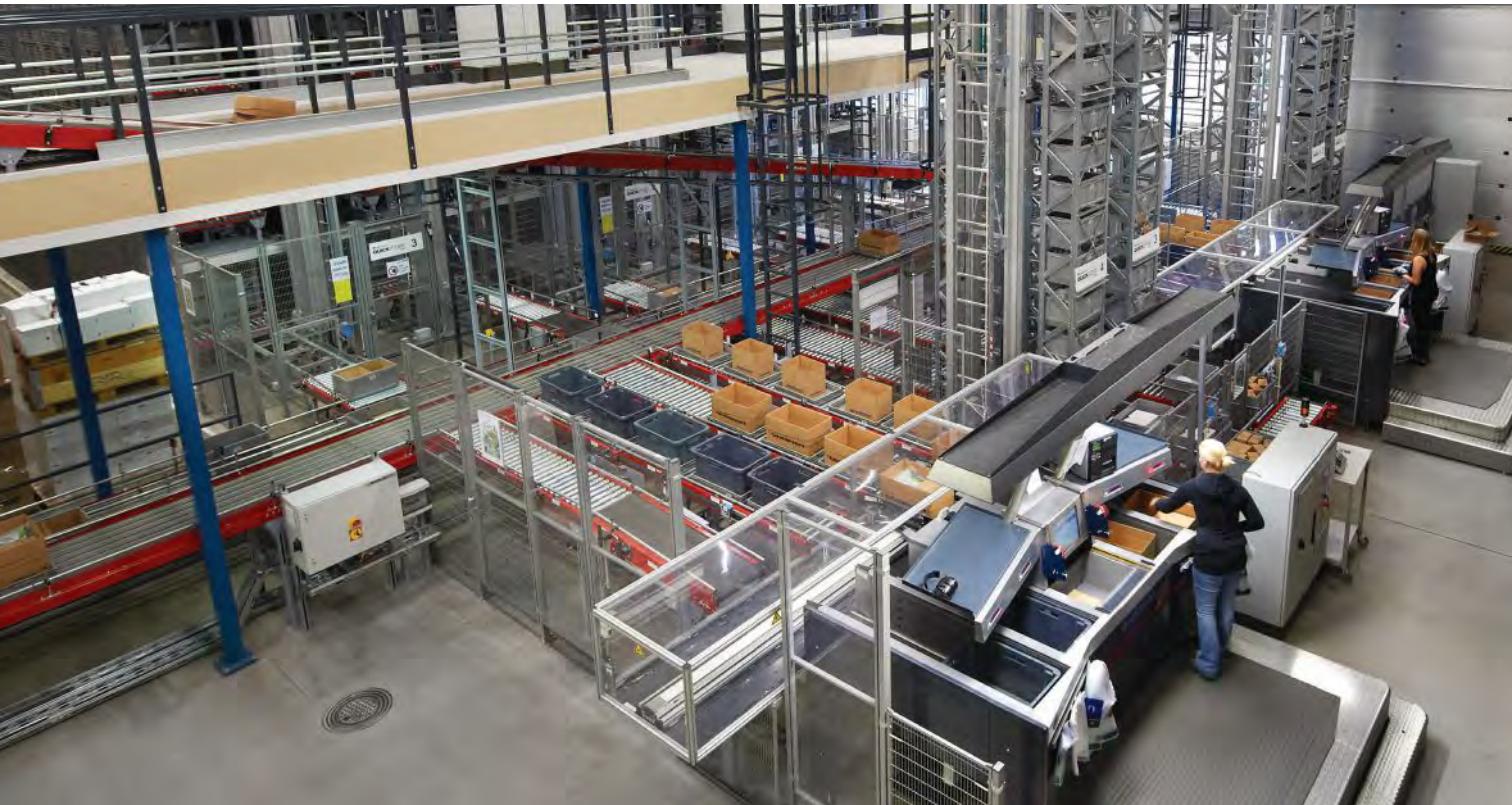


## Plan to spend



Source: Peerless Research Group (PRG)

## *Fast, accurate order fulfillment*



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10 respondents. Labor management saw a 6% jump to 27%, and those with software that enables new picking solutions like light-directed, voice and goods-to-person nearly doubled to 26%. The popularity of supply chain management and planning software, like supply chain planning (SCP) and demand planning, is also up 11% to 42%.

The momentum of labor management and picking solutions looks set to continue among companies planning to evaluate, purchase or upgrade software in the next two years. Respondents are targeting warehouse management software (38%, up from 29%), picking software (29%, up from 18%), warehouse control systems (22%, up from 16%) and labor management (21%, up from 16%).

The adoption of engineered labor standards (ELS) increased among this year's group, from 40% to 44% currently using ELS. However, far fewer respondents have interest or plan to implement engineered labor standards in the future. Last year, a full quarter of those surveyed reported that they use or plan to use ELS, but now only 12% are in the market, and 44% expressed no interest at all.

**Challenges**

Our survey asked readers about the challenges they have experienced or might

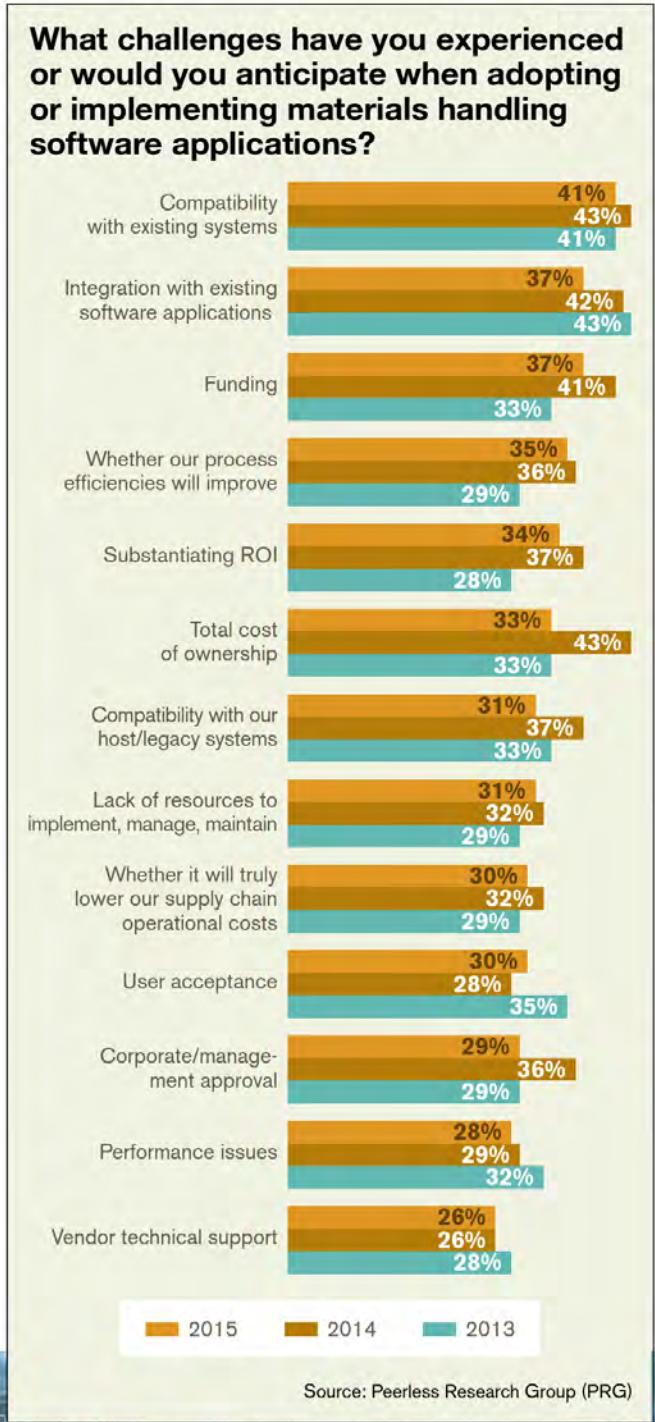
anticipate when adopting or implementing materials handling software applications.

Despite the caution indicated elsewhere in the survey, respondents' concerns in general are down. Readers are less concerned with corporate management approval (-7%) compatibility with host or legacy systems (-6%), a lack of resources to manage and maintain (-7%), user acceptance (-7%), integration with existing software (-5%), funding (-4%) and substantiating ROI (-4%).

Concerns over a new system's ability to integrate with existing systems have held at lower levels, at about 41%, and worries over user acceptance saw a slight uptick to 30%. Total cost of ownership continued a seesaw pattern ranging from 43% to 33% of respondents concerned, settling this year on the less challenging side.

Hill breaks the challenges cited into three general areas: implementation, financial and performance.

"The numbers for implementation are still too high, and too many respondents are mentioning system performance and support issues, which have held steady in this survey since 2011," Hill says. "There are no shortcuts to success for any of these systems. With a solid roadmap, rigorous planning, specification development, performance metrics, reference checks and a fully on-boarded workforce, the majority of users are making it happen." □





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# Top 20

## supply chain management software suppliers

**The market for conventional solutions continues to rise, even as innovative variations help the industry chart a new course.**

By Josh Bond,  
Associate Editor

**T**he market for supply chain management (SCM) software, maintenance and services continued its growth in 2014, generating \$9.924 billion in 2014, a nearly 10% increase over 2013 revenues, according to the research firm Gartner (gartner.com). That total includes applications for supply chain execution (SCE), supply chain planning (SCP) and, for the second year in a row, procurement software. Since 2009's 2% decline, the SCM market has posted double-digit growth in three of the past four years, according to Gartner.

SCM applications outpaced most software markets, "because supply chain remains a key source of competitive advantage in driving business growth objectives," according to Chad Eschinger, Gartner's vice president of supply chain.

Looking forward, Gartner is predicting a compound annual growth rate (CAGR) for supply chain management (SCM) software of 10% for the next five

years, reaching \$16.3 billion in 2019.

"The industry is in a replacement cycle, but we're also seeing supply chain capabilities spreading into places like retail stores," Eschinger says. "The goal is improved collaboration across a broader platform, which can drive much higher levels of efficiency."

Despite supply chain software's rapid growth across a variety of applications, Eschinger says plentiful opportunities still exist. "Many existing systems have high levels of customization or are outdated legacy systems," he says. "For many organizations, swapping and reconciling information internally is a challenge. There are few single systems of record, and if you don't have your own house in order, you're really at a disadvantage."

### **The view from the top**

Overall, the market for SCM solutions like warehouse management systems (WMS) and transportation manage-

## Top 20 supply chain management software suppliers

No.	Supplier	2014 Revenue	Web site	SCP	WMS	MES/MRP	TMS
1	SAP	\$2,563 billion	sap.com	x	x	x	x
2	Oracle	\$1,451 billion	oracle.com	x	x	x	x
3	JDA Software	\$438 million	jda.com	x	x	x	x
4	Manhattan Associates	\$188 million	manh.com	x	x		x
5	Epicor	\$163 million	epicor.com	x	x		x
6	IBM	\$148 million	ibm.com	x			
7	Descartes Systems Group	\$140 million	descartes.com				x
8	Infor	\$104 million	infor.com	x	x	x	x
9	HighJump Software	\$92 million	highjump.com		x		x
10	GT Nexus	\$90 million	gt nexus.com	x			x
11	Kewill Systems	\$81 million	kewill.com				x
12	PTC	\$72 million	ptc.com	x			
13	E2open	\$66 million	e2open.com	x	x		x
14	Unit4	\$65 million	unit4.com		x	x	
15	Quintiq	\$53 million	quintiq.com	x		x	x
16	IBS	\$52 million	ibsus.com	x	x	x	x
16	IFS	\$52 million	ifsworld.com/en	x	x	x	x
17	Inspur Genersoft	\$51 million	en.inspur.com	x			
18	Kinaxis	\$50 million	kinaxis.com	x		x	
18	TOTVS	\$50 million	totvs.com	x	x		x

Source: Gartner

ment systems (TMS)—excluding procurement revenues—is at \$6.74 billion, a 9.5% increase from 2013 and a 47% increase since 2010. Under the SCM umbrella, the market for supply chain planning systems rose 8.7% to \$3.66 billion. The supply chain execution market topped \$3.08 billion, a 10.5% increase.

The top five market leaders are the same for the third year in a row, but they have collectively added \$905 million in SCM revenues over that period, for 23% growth. SAP (\$2.563 billion) alone grew 20%—the third-highest rate of the list—and continues to pull away from the comfortable second-place finisher, Oracle (\$1.451 billion). JDA is also likely to enjoy third place for the foreseeable future, but things start to get interesting from there. Less than \$100 million separates fourth and 11th places, a group that grew by 9% in the last year.

### 2014 Top 5 SCP suppliers

No.	Supplier	2014 SCP Revenue
1	SAP	\$1,120 billion
2	Oracle	\$580 million
3	JDA Software	\$326 million
4	PTC	\$56 million
5	Epicor	\$54 million

Source: Gartner

#### Notable trends

Several trends were at work last year in each of the five categories relevant to our readers: enterprise resource planning (ERP) and supply chain planning (SCP), procurement, WMS, TMS and manufacturing execution systems (MES).

At first glance, procurement may seem like an odd category in a list of supply chain-related software applications. However, procurement continues to become more integrated with the broader supply chain process,

Eschinger says. Increasingly, end users are bringing automation to their procurement practices to make that link. “In my view, there’s an emerging concept of ‘the procurement network,’” he says. “Think about integrated business planning, not only to share sales and operations plans (S&OP) internally, but also, in collaborative commerce, to share that plan upstream and downstream in the supply chain so everyone is on the same chapter.”

Ultimately, the industry is working toward enhanced visibility into each item’s total landed cost from supplier to consumer. “These capabilities are in their early stages,” Eschinger says, “but that view into total cost to serve will be incredibly valuable to an organization. Right now, they might know at the organizational level whether a division made money, but few can say whether a specific SKU or order was profitable.”

Continued interest in inventory optimization software was evident, growing 10% in 2014. Similarly, S&OP solutions posted the third-straight year of gains above 20%. Eschinger says the software markets for transportation grew 12%, while order management (18%) and global trade (16%) also posted double-digit gains.

Meanwhile, cloud-based software grew more than 17% over the past year, with strong interest in cloud solutions in the WMS space. “What’s notable is that it confirms the recognition that the WMS market is not one homogeneous marketplace,” says Dwight Klappich, research vice president with Gartner. “A lot of the focus on the dialogue, to be frank, has been at the high end of the marketplace, but the vast potential market is made up of less sophisticated organizations that need basic and easy-to-use controls.”

Klappich highlighted several trends in the WMS and TMS space:

• **Cloud gains ground**

In the supply chain execution space, including transportation and global trade, warehousing has traditionally lagged other applications. Solutions inside the four walls were considered mature and primarily on-premise, with no compelling reason to upgrade. “We’re past that now, and we’re seeing a lot more interest

in cloud-based solutions,” Klappich says.

The two fundamental styles of cloud solutions are public, or multi-tenant, and a dedicated cloud. “Multi-tenant options are gaining some traction, but it’s generally not the preference,” he says. “Customers want the flexibility and scalability of cloud infrastructure along with the performance guarantees of a dedicated instance, especially at the higher end of marketplace.”

• **The omni-channel imperative**

Growth at the top end of the WMS market—the Tier 1 level—has largely centered on omni-channel commerce capabilities. “One retail CIO told me WMS systems were once seen as bottom up projects, where you need to make the case to senior management,” Klappich says. “They would run it up the flagpole every year until things got so bad that they finally approved the project. But omni-channel is so fundamental to business today that it now comes from the top down. They’re not going to argue or postpone these strategic decisions anymore, because you can’t be a retailer if you don’t do omni-channel.”

• **Retailers are not alone**

The concept of omni-channel is bleeding into other industries, including

manufacturing and the distribution of high-end designer products. “A manufacturer might have commercial products that move in traditional full truckloads,” Klappich says, “but they have 60,000 other SKUs that move in much lower volumes.”

In the past, a bath design shop in California that needed a specific \$5,000 bathtub would place an order that would trigger the manufacturer to produce and ship another unit. Meanwhile, a distributor in Massachusetts may have that same tub in stock and is wondering what to do with it. Manufacturers are looking for functionality that will allow them to combine omni-channel commerce with a wholesale distribution model.

• **Distributed order management**

Distributed order management—or DOM—is an emerging capability coming from WMS providers. For the past several years, brick-and-mortar retailers have focused on establishing themselves as players in the e-commerce space. Now, the focus is on how to most profitably fill an order from a network of DCs, retail store locations or drop shipments from a manufacturing partner or supplier. DOM solutions, which sit in between an order management system at the enterprise level and the WMS, fill that need. A DOM solution figures out the most profitable way to fill and ship an order based on customer expectations or some other parameter.

“Companies realize that they can no longer ship an order for more than it’s worth,” Klappich says. “The more they virtualize inventory across their network, whether it’s in one or more warehouses, at stores or at a supplier, the more they need strong analytic capabilities to manage that process. That has created a brand new environment that is driving a lot of investment.”

• **Execution at the extremes**

Klappich notes an accelerating bifurcation of the TMS marketplace into systems aimed at the high end and those

**Acquisitions continue to drive the market**

Eschinger says the industry can expect a new wave of acquisitions to continue to drive market disruption in 2015. A few notable developments in 2014 included:

- Accellos and HighJump Software merged, each a leading global provider of supply chain management software and trading partner network technology.
- Dassault Systèmes, a product lifecycle management supplier, acquired Quintiq, a leading provider of on-premise and cloud-based supply chain and operations planning, and optimization software.
- Descartes Systems Group, a leader in on-demand, software-as-a-service solutions, acquired Customs Info, a leading U.S.-based provider of

trade data content for global trade management systems and automation.

- Kewill, a leading provider of supply chain execution software, acquired the IBM Sterling TMS, a SaaS-based multimodal transportation management system.
- Manhattan Associates, a supply chain commerce solutions provider, acquired the assets of Global Bay Technologies, adding in-store sales and client capabilities to its omni-channel inventory and order management solutions.
- NetSuite, a leading provider of enterprise-class cloud ERP suites, acquired the WMS product side of eBizNET.
- Siemens acquired MES specialist Camstar Systems.

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geared for less sophisticated users. “A large, complex company managing \$100 million of freight will tend to attract the big software providers,” he says. “The rest of the market is going after small, regional operations, and there are far more companies managing less than \$75 million in freight than there are big players.”

In North America and abroad, even with new solution providers entering all the time, Klappich suggests the low-end marketplace is maybe 10% to 15% penetrated.

**• Parcels a bigger part of the package**

Klappich notes a resurgence of demand in the parcel handling market, fueled in large part by omni-channel pressures. “Parcel is not new, but it’s different,” Klappich explains. “Aside from the last mile complexities, if you need to ship a sweater from Los Angeles to Atlanta, the person processing that is not a full-time shipping clerk. When a college student working part time needs to get five orders

out this afternoon, the solution needs to be very simple.”

He adds, “The bottom line is this is a new era for parcel. I still talk to people running 20-year-old systems who say they’ve been happy with it, but these new business models heat up the need to change.”

**MES on the move**

In comparison to the supply chain planning and execution spaces, the manufacturing execution (MES) space has always been fragmented and difficult to quantify.

That remains the case today, according to Rick Franzosa, a research director and author of Gartner’s MES Market Guide. “It’s always been frustrating to pin down a precise definition of MES, and each of the half dozen variations of MES has a fairly small number of players,” he says. “In fact, Gartner’s Market Guide references just 37 suppliers in the MES space.”

**2014 Top 5 SCE suppliers**

No.	Supplier	2014 SCE Revenue
1	Oracle	\$494 million
2	SAP	\$436 million
3	Manhattan Associates	\$175 million
4	Descartes	\$140 million
5	JDA Software	\$99 million

Source: Gartner

It has also been a dynamic market, with a significant number of acquisitions over the past decade. Once a supplier gets above \$30 million in revenue, it’s often a candidate for acquisition by a bigger player.

With those caveats, Gartner pegs the MES market at roughly \$2.2 billion in revenues, split into four areas.

**1.** Operational technology suppliers make up about 50% of the MES market, and include companies such as Rockwell Automation, GE Intelligence Platforms and Honeywell that include some MES capability in their core businesses.

**2.** ERP suppliers such as Oracle, SAP, FlexSystem and Epicor.

**3.** Companies focused on product lifecycle management (PLM) and CAD/CAM engineering, including Siemens, Dassault Systèmes, and Mentor Graphics.

**4.** Best-of-breed suppliers, which comprise 33% of the MES market.

Cloud is also a contender in MES, where Franzosa says the solutions are much more effective than many potential users believe. “They say they aren’t on the cloud, but instead use a corporate data center 300 miles away,” he says. “In my mind, what’s the difference? Latency, availability, uptime, security, all those things have been taken care of. It’s not rocket science, it’s not the future. It’s today.”

The question for MES companies, Franzosa says, is whether they have the resources to make their products cloud-ready. Small and large companies will struggle with this, he says, and currently only about a dozen MES suppliers have 10% or less of their install base running in the cloud. □

**Top 20: Making the list**

This is the 14th time *Modern* has reported on the supply chain software market from a business standpoint since 2002.

Although we initially focused on the top providers of WMS solutions, the lines between supply chain execution and supply chain planning providers are no longer clearly drawn; ERP providers supply WMS and supply chain execution providers offer planning and optimization solutions. Companies are increasingly looking to integrate their procurement activities into their manufacturing, distribution and transportation strategies.

For that reason, *Modern* partners with Gartner to create this list. Our starting point is Gartner’s annual list of the top supply chain management providers, which this year included 27 names. It’s a numbers game and not a popularity contest.

The rankings are based on Gartner’s estimates of a provider’s annual sales for 2014. Meanwhile, Gartner’s estimates are based on revenues related to supply chain

management software and not a company’s total revenues.

*Modern* makes just one adjustment to Gartner’s original list, stripping out companies such as Basware (\$132 million), SciQuest (\$80 million), IQNavigator (\$67 million) and BravoSolution (\$62 million) that are primarily focused on procurement. While our readers may now coordinate activities with purchasing, our list is intended to reflect that their duties are still focused on planning and execution.

Admittedly, this is an imperfect science. Gartner, for instance, strips out hardware sales from its estimates. For that reason, Gartner credits Manhattan Associates with \$188 million when the company’s overall revenues totaled \$492 million. What’s more, Gartner does not follow the warehouse control systems (WCS) or manufacturing execution system (MES) spaces for the purposes of its chart. Finally, it does not include SCM suppliers that focus on specific verticals.

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# 4 new ways AGVs & carts support automotive

**With operational flexibility and safety best practices guiding automotive manufacturing facilities, automatic guided vehicles and carts are now doing more than just bring components and kitted parts to lineside workers.**

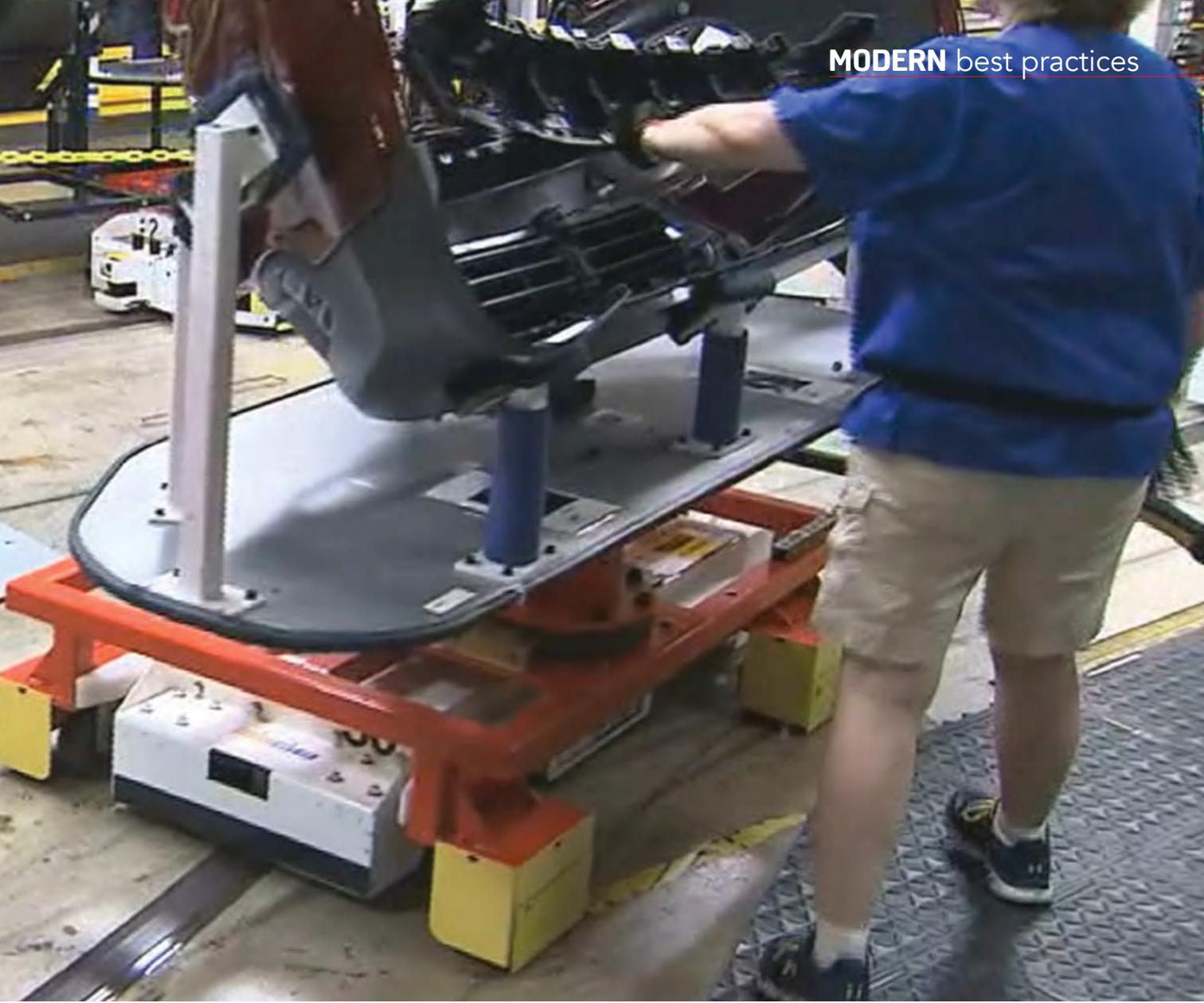
By Sara Pearson Specter, Editor at Large

**D**riverless, battery-powered automatic guided vehicles (AGVs) and automatic guided carts (AGCs) have long been deployed at automotive original equipment manufacturer (OEM) facilities as a means to eliminate forklifts and the inherent potential safety risks they pose to personnel and products.

“Automotive manufacturers want to get

rid of manual fork trucks in the production areas because they can be the most dangerous piece of equipment in the plant,” says Greg Pachuta, sales manager at JBT Corp. “Safety is often one form of justification for the investment in an AGV system.”

Initially deployed to deliver components and kitted parts to assembly workers line-



side at the point of vehicle assembly, automakers have now further expanded the use of these autonomous vehicles elsewhere in their plants. The practice not only extends the “fork-free” safety mandate, but also supports greater flexibility within operations as OEMs now build multiple vehicle models on the same line—and offer an ever-expanding selection of customization options to customers.

Further, AGV and AGC installations have trickled down from OEMs to their suppliers. Now, Tier 1, 2 and 3 sub-assembly and component manufacturers who supply the automotive OEMs are installing these systems in their own facilities, and reaping the same ben-

efits, explains Terry Shaw, operations manager at Murata Machinery USA. “Most of our AGV systems are installed at the supplier level,” he says.

A variety of AGV and AGC styles support the need for manufacturing flexibility, adds Shaw. “Fork-based AGVs are generally larger units that hold larger capacities. Their forks handle and transport loads, typically short distances, and the latest models can now reach heights of 24 feet to interface with four- to five-level high storage rack,” he says.

Tugger-style AGVs and AGCs pull one or more carts along behind them in a train across longer distances. And, single-unit AGVs and AGCs can be

**Some of the newest automotive manufacturing plants use AGVs as the base upon which a car body or component assembly travels during assembly, instead of permanent conveyor-based transport installations.**

customized with different mechanical transfer unit attachments, including roller conveyor, chain conveyors and lifters. These add-ons support ergonomics, making it easier for a worker to access the transported item or move it to or from the vehicle.

The experts *Modern* spoke with for this article outlined four ways automatic vehicles can support operational flexibility and safety best practices at automotive manufacturing facilities.

### 1 Vehicle and component assembly flexibility

Instead of only delivering parts and components to a permanent overhead or in-floor conveyor-based assembly line, some of the newest automotive manufacturing plants are using AGVs as the base upon which a car body or component assembly travels during assembly, says Noel Dehne, vice president of automotive sales for Daifuku America Corp.

“OEMs are creating a continuous build line based on AGVs and AGCs,” Dehne explains. “Advances in the vehicles’ drive systems and electronics create the torque required for a continuously moving production line traveling at a slower speed that maintains accurate spacing between the parts.”

Should production rates increase or decrease, it’s much easier to make adjustments to the automatic vehicle line than to a permanent conveyor installation without a huge capital expenditure, adds Dehne. “Further, using this concept, it’s very easy to pull

a job out on the spot if a manufacturing flaw is observed at any point during production—not just during designated quality control areas.”

### 2 Human-free access to secondary manufacturing and buffer storage areas

Manufacturers are also adding fleets of AGVs and AGCs to secondary manufacturing and assembly processes outside of the main assembly line, such as in body shop areas, says Keith Soderlund, vice president of sales of Creform.

“AGCs are ideal for feeding and removing the finished parts from robotic stamping and welding stations,” he says. “This eliminates the need for personnel to enter the robot’s safety cage zone, which requires a shutdown for safety. Instead, the vehicles can automatically enter secured work cells to remove carts of finished components and replace them with empty carts without interfering with the robot’s operation.”

For example, says Soderlund, an

AGC can pull an empty cart into a work cell, disengage its connection pin, then travel to a full cart of welded doors, engage that cart and exit the cell. From there, the AGC travels directly to the assembly line where it disengages from the full cart, reconnects to an empty cart and returns to the robotic welding cell to repeat the exchange process.

Although automatic vehicles have traditionally been used to facilitate horizontal movement of items, more automotive manufacturing operations are deploying fork-style AGVs that can access work-in-process items stored vertically.

“Automotive OEMs are all about keeping their production lines up and running as much as possible, so they’ve started looking at adding secondary buffer storage areas closer to the production line to hold additional stock,” says Scott Hinke, director of North American sales for AGVs at Dematic. “Products come from one sub-assembly area and head into a smaller buffer storage zone prior to being needed at the next work cell.”

“The AGVs provide more flexibility in a facility’s overall work piece movement and workflow design,” adds Bryan Knott, global product manager for Dematic AGVs. “They’re no longer limited to linear movement from work cell to work cell. Instead they allow manufacturers to automate storage without tethering an AGV to a single aisle—they provide both horizontal transportation and vertical storage at the same time.”

At the supplier level, these buffer zones (also called supermarkets), store small parts in totes on flow rack. Personnel stationed there build kits by hand of unique components to support mixed product assembly. When the kits are complete, tugger-style AGVs can pull carts of kits to another production destination for further assembly steps.

“Kit part delivery to the appropriate station improves the picking efficiency of a line worker and keeps the most skilled production employees working on the line,” adds Soderlund.



**Customizing single-unit AGVs and AGCs with mechanical transfer unit attachments—including roller conveyor, chain conveyors and lifters—makes it easier for a worker to access the transported item or move it to or from the vehicle.**



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**Fork-style AGVs can access work-in-process items stored vertically then place those items on carts that route lineside with tugger AGVs.**

more parts without any packing or dunnage. “If the part changes, you just bolt on a new upper, but the cart system still supports that need for flexibility.”

“Meanwhile, less skilled employees can be used to assemble the kits. By adding the AGVs to synchronize the delivery of subassemblies and parts, personnel can be deployed to value-added tasks.”

### **3** Various cart forms support various functions

The carts pulled by tugger-style AGVs and AGCs have also been enhanced to support flexible manufacturing, says Larry Tyler, vice president of sales and marketing at K-Tec.

“Carts are used to bring out raw materials as needed for assembly, as well as finished goods transfer. They’re also being used on the warehousing side of an assembly operation for picking of kitted parts and tooling and transfer to both lineside and buffer storage,” he says.

One of the newest cart trends being applied in automotive manufacturing is the use of mother/daughter carts. These two-part systems include a larger mother cart that corrals several smaller daughter carts inside it. The smaller carts can be easily separated from the mother without dismantling the train.

“These cart systems offer flexibility in sequencing, improvements in ergonomics, and the systems can be designed so that the daughter carts can be fairly low cost, while the mother carts can be more expensive—because they need far fewer of them,” Tyler says. “You might have 10 mothers and 200 daughters.”

Further, the daughter carts often ride on a common base with customized, bolt-on upper sections. The upper cart sections are customized to hold one or

### **4** Virtually limitless navigation and travel flexibility

The variety of navigation options also makes implementing AGC and AGVs in automotive OEM and supplier facilities an easier decision. Magnetic tape-guided systems are the least expensive and require no damage to an existing floor surface, as they simply adhere (as opposed to magnetic bars embedded in the floor). In laser-guided navigation systems, reflective tape is placed on columns, walls or the ceiling at regular intervals along a path.

On-board laser detection interacts with the reflective tape and communicates the angle of the intersected laser beam back to the control software to determine location. Gyroscope systems for inertial navigation detect waypoint transponders embedded in the vehicle path for validation of the vehicle’s position. Camera- or vision-based systems read stickers, such as bar codes adhered to the floor, allowing the vehicle to communicate its location back to the control software to verify that it’s on the correct path.

The development of a completely autonomous navigation system, which uses a virtual map of the facility paired with vision systems and navigational algorithms, is on the horizon. Taken together, the vehicles’ on-board controllers use all these information inputs to enable the vehicle to make travel adjustments—based on fixed (or moving) obstructions—while remaining in motion, says Dematic’s Knott.

“Although it’s not here yet, these sys-

tems will allow the vehicle to follow a virtual, preferred traffic lane, yet still be able to deviate intuitively from that to avoid as many obstacles as possible,” he says. “There’s been a lot of interest in this from the automotive industry because it could potentially add another 10% to 15% movement efficiency with less teaching time than laser- or magnet-based systems and minimal infrastructure and commissioning.”

Further, advances in vehicle control software allows for flexibility in path programming, adds Murata’s Shaw. “If you want to run different production routes on Tuesday and Thursday, you can pre-program the vehicles to travel different paths, allowing you to use the same AGV to support different processes depending on the day,” he says.

Safety systems, including laser- or vision-based technologies, reduce the risk of collisions and enable faster running speeds, says JBT’s Pachuta. “In the old days we used mechanical bumpers that actually had to make contact with an object to trigger a stop,” he says. “Now the vehicles include solid-state laser bumpers that can be programmed with different, adjustable sensor fields. That allows users to have their vehicles travel faster across longer distances.”

With the newest sensors, the vehicles can travel faster because they can detect an object further away from the sensor. That means the faster a vehicle travels, the further the distance the safety sensor can be programmed to cover, Pachuta says. Depending on the distance between the object and the vehicle, the vehicle can be commanded to slow down gradually or abruptly stop. □

### **Companies mentioned in this article**

- Creform
- Daifuku America Corp.
- Dematic
- JBT Corp.
- K-Tec
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# Lights, voice, action

A look at what's new in voice, mobile and pick-to-light technology for today's warehouses and distribution centers.



By **Bridget McCrea**,  
Contributing Editor

**A**s technology continues to advance at the speed of light, the equipment used to manage warehouse and DC fulfillment is improving and expanding exponentially. Every year, in fact, suppliers churn out an array of new voice, pick-to-light, and related innovations that enable processes and help employees work smarter, better and faster.

Concurrently, historical roadblocks like long implementation periods and the constraints imposed by proprietary software are coming down and allowing companies to more effectively combine different technologies, use cloud-based options, and integrate various software platforms. This development helps enable a cohesive, streamlined opera-

tion that can effectively handle even the most demanding omni-channel environment.

## Thinking out of the box

Much like the world of consumer devices is thinking lighter, smaller and faster, these days the trend in the warehouse is for user-worn or handheld equipment to be small, light and quick.

Add ease of use and affordability to the mix, and you wind up with a real "winner" in the warehouse fulfillment category, says Doug Brown, head of global product management and marketing for Intelligrated. Wearables like glasses are in particularly high demand right now, he adds, due to their abil-



ity to provide a “hands-free and safer addition for visual cues that previously may have required looking down at a display.”

Brown sees Apple’s Siri and Google’s speech recognition programs as proof of the “tremendous amount of innovation” that currently exists within the voice realm, where new performance levels can be enabled in a fairly fast and easy way compared to, say, 10 years ago.

“Voice in the warehouse works out of the box without the need for any special training or proprietary technologies,” says Brown, “and all the while still being flexible enough to accommodate those individuals who may speak in an unusual manner.”

#### More smart phones, please

Last year, Lucas Systems introduced Jennifer Mobile applications for smart phones. Since then, Jeffrey Slevin, COO, says user interest in the applications has grown significantly. “Almost every new customer is interested in using these more powerful devices, and many of our existing customers are considering moving to this new platform,” says Slevin, noting that the devices cost 50% to 90% less than traditional devices used for voice applications.

Also driving interest in these devices is the fact that they are “just plain better than old-style warehouse hardware.” Key improvements include faster processors, expanded memory,

**Every year, suppliers churn out an array of new voice, pick-to-light, and related innovations that enable processes and help employees work smarter, better and faster.**

better and bigger screens, Bluetooth technology, NFC support and additional accessories.

According to Slevin, rugged smart phones spur the continued evolution of so-called “multi-modal” applications that combine speech, bar code scanning, screens, and other input and output technologies. For example, Lucas has certified a variety of smart watches that can be used with a rugged smart phone,

thus “opening up new ways to use text or display information in a voice-directed process,” says Slevin. In addition, while most voice suppliers provide solutions to voice-enable a warehouse management system (WMS), Slevin says Lucas is providing “mobile work execution” solutions that allow companies to quickly implement new workflows (from receiving to shipping to returns) that optimize hands-on processes.

“Within two to four months, a DC can install a solution that delivers transformational operational improvements,” says Slevin, “and that also allows them to break free of inflexible WMS workflows that are difficult, expensive and risky to change.

### Next-gen hardware options

It’s been about 13 years since The Numina Group introduced its first pick-to-light product. Since then, Dan Hanrahan, president, says the product category has grown right along with customer interest in that type of equipment, particularly when bar code scanning is integrated in such packages. Early on, he says, pick-to-light was a better option over voice, which at the time required “weeks of training” to get someone up to speed and using the technology. Working with topVox,



**Pickers in a DC can wear a rugged smart phone on their hip, which connects to a Bluetooth headset and smart watch.**

“Our next major release will include both Android and iOS support” says Breutzmann, who points to device affordability as a key driving factor in this movement.

### Affordability and ruggedness count

As he looks around the warehouse and DC fulfillment environment, Kevin Breutzmann, national account manager at topVox sees an increasing number of consumer-grade devices (i.e., iOS and Android devices) being used on the floor. And, while there’s still much ground to be made in terms of the ruggedness, durability and platform stability of such devices, he sees their use growing over the next few years.

Earlier this year, topVox introduced the Lydia VoiceWare voice-picking safety vest that includes a mobile computer, two speakers and a directionalized microphone. “It’s easier for the user to manage, with fewer wires and cords to deal with,” says Breutzmann. “It’s an all-in-one package that we’re excited to be able to deploy.”

At Voxware, president and CEO Keith Phillips says the growing affordability of voice-related equipment is making it particularly attractive for companies that are seeking better speed and accuracy in their fulfillment operations.

“There’s a continued pressure to push prices down in the marketplace,” says Phillips, who sees potential in the iOS and Android space, but notes that for the most part companies are hesitant to implement such devices in the warehouse environment. He points to Voxware’s use of Bluetooth headsets “at a fraction of the cost of what they’ve historically sold for,” as one good example of how users can effectively unte-

Numina integrated its own picking system using topVox’s speaker-independent voice engine. “We wanted something that allowed for easy editing and that helped us be more flexible in how we implement the voice system,” says Hanrahan, adding that Numina’s voice and pick-to-light functionalities reside within the same module.

In taking advantage of what Hanrahan calls “next-generation hardware,” Numina is now using scanners that are positioned on the back of the wrist in a completely hands-free manner. The scanners integrate 2D cameras that are “much faster than lasers,” according to Hanrahan. “You don’t have to point them, nor are there focusing issues to contend with (due to the camera’s omni-directional, auto-focus capabilities). “This innovation has definitely sped up the vali-

**Using a voice device with a scanner and a wireless headset, a mobile worker is able to pick products within the DC.”**



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ther themselves and work more freely in the warehouse or DC.

“We’re getting away from the scenarios where Bluetooth headsets are in the \$600 to \$800 range,” says Phillips, “which is just ridiculous to have to pay for a headset.”

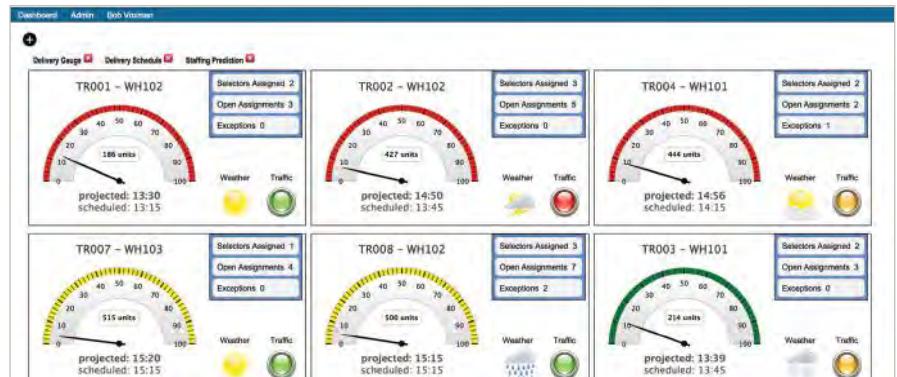
In fact, Phillips says high prices on devices across the board are keeping many companies from investing in such technology. “Manufacturers may be changing form factors and other elements, but they’re still not doing what they should be to provide lower prices, more economical options and more user-friendly devices,” says Phillips. “These challenges limit the choices that a customer has in terms of device technology.”

### Look mom, no hands

In today’s fast-moving business world, everyone wants shipments delivered in the fastest and most accurate manner possible. With the 2015-2016 holiday season just a few months away, Jay Blinderman, director of product marketing for Honeywell’s Vocollect Solutions, says now is a good time for warehouse managers and DC directors to start reviewing last year’s performance numbers and coming up with ways to improve upon their stats this year.

Those companies that aren’t already using voice, and that need to do a better job of covering their seasonal shipment peaks, should consider how “voice technology will enable them to reduce training time from days to literally hours and ramp up new teams of employees very quickly,” says Blinderman.

One of the latest innovations that Honeywell’s Vocollect Solutions has introduced is its Talkman A730 mobile device, which contains an integrated short-range scanner. The device incorporates voice direction and scanning in an “ergonomic, wearable form factor that eliminates workers from having to deal with a luggable device,” Blinderman explains. “Using the A730, a worker can even scan hands-free by speaking a voice command to activate the scanner when moving boxes with



**New predictive analytics can provide insights into the impact that voice would have if added to the warehouse operation and also if additional pickers are needed on a particular truck to ensure that it departs on time.**

labels past the scan target while the A730 rests on a worker’s belt.”

Also new this year is the Vocollect SRX2 wireless headset, which can be combined with Vocollect SoundSense voice recognition technology to enhance accuracy levels and worker performance. “There are some other areas within voice where we’ll be launching new solutions as well,” says Blinderman, “including one that will be useable for retail applications.”

### Breaking out of traditional “zones”

With an eye on supporting omni-channel operations and other specialized and personalized warehouse operations, Lightning Pick recently introduced the LP Light Sled. According to Joe Pelej, marketing manager, the sled is equipped with lights, positioned on a conveyor, and used in manual picking environments.

Used primarily in warehouses that have pick-to-light systems in place, the sled lets companies effectively “break out of the typical, zoned pick-to-light” setup and allows them to conduct cluster picks, says Pelej, and go beyond just picking orders that are for a specific customer or stores. “When the products arrive at the store, DC or other destination,” he says, “they are already grouped together for easier replenishment.”

With omni-channel exploding, Pelej

says he’s seeing more applications and equipment being introduced that support both pick- and put-to-light technology. These innovations support the ongoing trend toward smaller orders, single-line orders and cross-channel orders, he says. “Vendors are creating hardware and software (including those where pick is integrated with conveyor control, motor-driven rollers and lighted conveyors) that lets retailers handle more and different channels as their DCs change,” says Pelej, “and to do a combined pick-and-put to accommodate those various channels.”

Looking ahead, Pelej expects warehouses to become even more flexible to meet the changing demands of their customers, be it related to store replenishment, e-commerce, and/or shipments to single customers. “There’s a lot of active, agile, cross-channel fulfillment going on in the warehouse,” says Pelej, “and much more personalization than we’ve ever seen before.” □

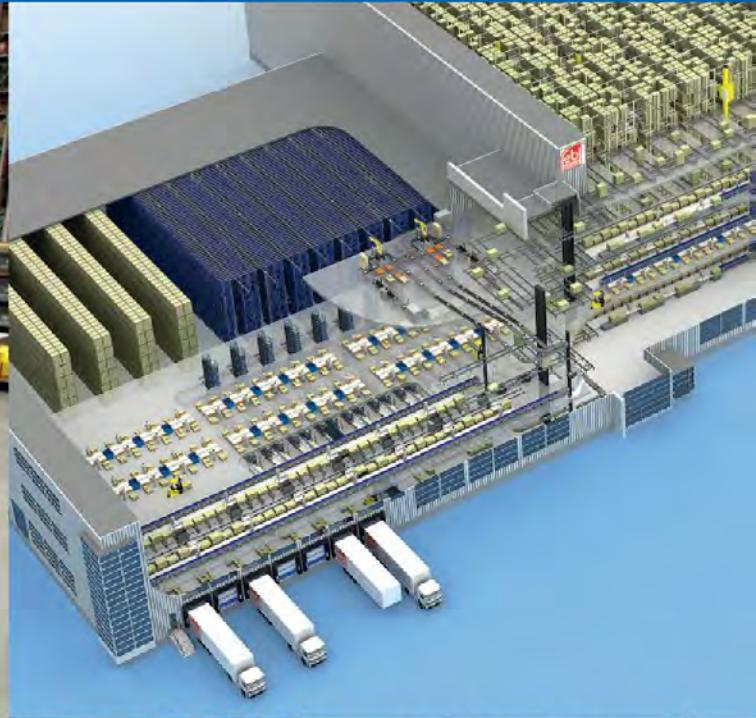
### Companies mentioned in this article

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By Josh Bond,  
Associate Editor

# Cloud WMS improves grocer's operations under a single umbrella



*Popular online grocer cuts scrap rate, reduces IT burden with cloud-based warehouse management system.*

**C**obornsDelivers is the largest online grocery delivery service in the Minneapolis–St. Paul area. Customers place orders online for fresh meat and produce, deli and seafood, wine and spirits, freshly prepared meals and regular grocery items, with delivery as early as the same day. After transitioning to a cloud-based warehouse management system (WMS), the company reports that it has improved system flexibility and product traceability.

The company's previous WMS was not able to meet its needs for a fast and flexible supply chain execution solution. In turn, it selected a cloud-based WMS based on its on its track-and-trace functions, such as expiration date tracking and rotation. The new WMS (HighJump, highjump.com) is integrated with the company's purchasing system, online customer order system and financial system, among others.

Inside the company's 250,000-square-foot distribution center, the cloud WMS now manages receiving, put-away, inventory management, order process-

ing, replenishment, pick/pack, loading and shipping for an average of 700 orders per day. It also provides CobornsDelivers with the ability to build its own business processes using configuration tools.

"I've been through a lot of systems and conversions in my career, and this has been one of the best and one of the easiest for training employees," says Phyllis Duerr, production operations manager. "Configuration changes are seamless and easy."

The supplier hosts the WMS application and hardware infrastructure, while CobornsDelivers accesses the WMS from a Web browser, gaining the functional benefits of a WMS with fewer IT resources and faster upgrades. Because the WMS is scalable, the company can access as much power as it needs to accommodate spikes in demand or growth.

The company has cut its scrap rate by 4% by using the intuitive tracking functionalities. "I can tell where something is each day, each hour and each minute—almost to the second," Duerr says. "I never have to wonder where an item is located." □

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By **Josh Bond**,  
Associate Editor

# Manufacturer cuts into downtime, provides more reliability



*Production uptime saves \$1.5 million with browser-based enterprise labeling solution.*

**A**s a leading global manufacturer of advanced plasma, laser and water jet cutting systems, Hypertherm employs 1,300 workers to serve customers like Ford, Volvo, Harley Davidson and Caterpillar. To address a range of issues with its complex home-grown labeling system, the company deployed a browser-based alternative that saved the company millions.

The company's existing homegrown system was customized with layers of third-party applications and many software licenses were no longer available. The system particularly limited the facility's 42 label printing stations, and downtime required five to 10 hours of troubleshooting and repair each week. All of this resulted in customer dissatisfaction, brand integrity issues, and lost revenues of between \$25,000 and \$100,000 worth of productivity each week.

"If labeling goes down, our production process

stops because it's part of our quality system to make sure that the products are completely together before they go out the door," says Robert Kay, information services operations support for Hypertherm. "If labeling goes down, we're dead in the water."

The new browser-based enterprise labeling solution (Loftware, [loftware.com](http://loftware.com)) uses the same application internally and for external customers to avoid multiple replicated databases. The company has reduced downtime, avoided mislabeling, simplified maintenance, sped production and provided reliable labeling for its global suppliers. Kay says the system has already saved \$1.5 million.

"We have a single labeling system to meet all of our needs, throughout all of our locations, across all of our suppliers worldwide," Kay says. "Labeling is the cap on the end of the manufacturing process that ties everything together." □



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**WAMAS®**

By **Josh Bond**,  
Associate Editor

# Cloud-based WMS creates opportunities and efficiencies for 3PL

*The system quickly configures requirements and blends orders for multiple clients in each building.*

**S**CI Logistics is a supply chain solutions provider whose logistics business is expanding rapidly to smaller clients that occupy between 25,000 square feet and 500,000 square feet. Managers found that typical e-commerce clients often require quick implementation.

Previously, the warehouse management system (WMS) had to be configured and modified according to clients' requirements for each unique use instance. Patrick A. Ressa, CIO of SCI Logistics, says the previous system required lots of back-end transactions that required detailed setup of the warehouses, plants and hierarchies. The new software-as-a-service (SaaS) solution (Logfire, logfire.com) requires an initial setup taking six to 11 weeks, and multiple clients may be added to one usage instance—whether they are in the same building or not.

"In the e-commerce space," Ressa says, "you want to get to small clients, since that's where the growth is. We can now group tens to hundreds of clients."

Each subsequent onboarding takes no more than two weeks. By transitioning to a cloud-based WMS,



the company is able to use the system with no additional hardware or infrastructure, while substantial process improvements were a result of the ability to blend orders from multiple clients. Previously, a facility with two clients would run two instances of the WMS, meaning it could not send pickers to both customers at the same time.

"To launch something of that magnitude could take three months," Ressa says. "We wanted to onboard customers quickly, but it ended up being even easier than we had hoped."

Ressa says that by the end of the year, SCI aims to have 10 facilities across Canada operating under one instance of the new cloud-based system. It will also continue to use the legacy WMS for facilities serving larger clients.

"They're kind of reinventing an old world," Ressa said of the software supplier. "WMS has been around a while, but they've added a new flavor. That was a pleasant surprise. And the fact that it's SaaS takes a lot of headaches out of our business in terms of back end hardware while improving execution times." □



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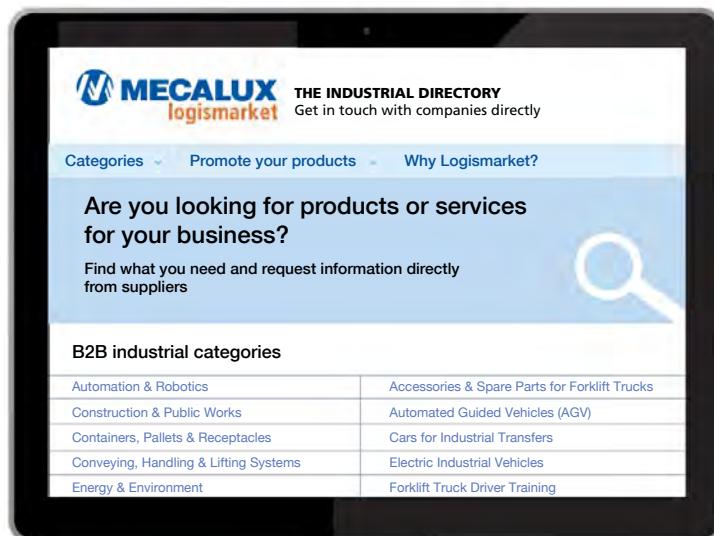
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# *Convergence* *gaining momentum*

**Modern takes a look at the state of software convergence and how it's being put to work in today's operations, as well as how suppliers are stepping up to offer platforms that work seamlessly with each other to solve today's complex challenges.**

**By Bridget McCrea,**  
Contributing Editor

If there's one trend that has unveiled the absolute need for synchronization among warehousing, transportation, order management and even procurement software platforms, it's omnichannel fulfillment.

Defined as a complex sales strategy centered on providing customers "seamless" shopping experiences whether they're using a mobile device, ordering over the phone, or visiting a brick-and-mortar store, omnichannel is transforming the way warehousing and distribution professionals set up and orchestrate their supply chain software platforms.

"In the past, there was enough latency in the processes to be able to handle the 'transactional rugby' with different systems," says Dwight Klappich, research vice president for Gartner. In comparing the supply chain to the rugby field, Klappich says that many are running around blindfolded, unsure of where and when to throw the ball—or even to whom to throw it.

When there are four or five days to figure out the situation, the issue isn't so pressing, but with omnichannel whittling that time frame down to hours or even minutes, the situation becomes much more challeng-

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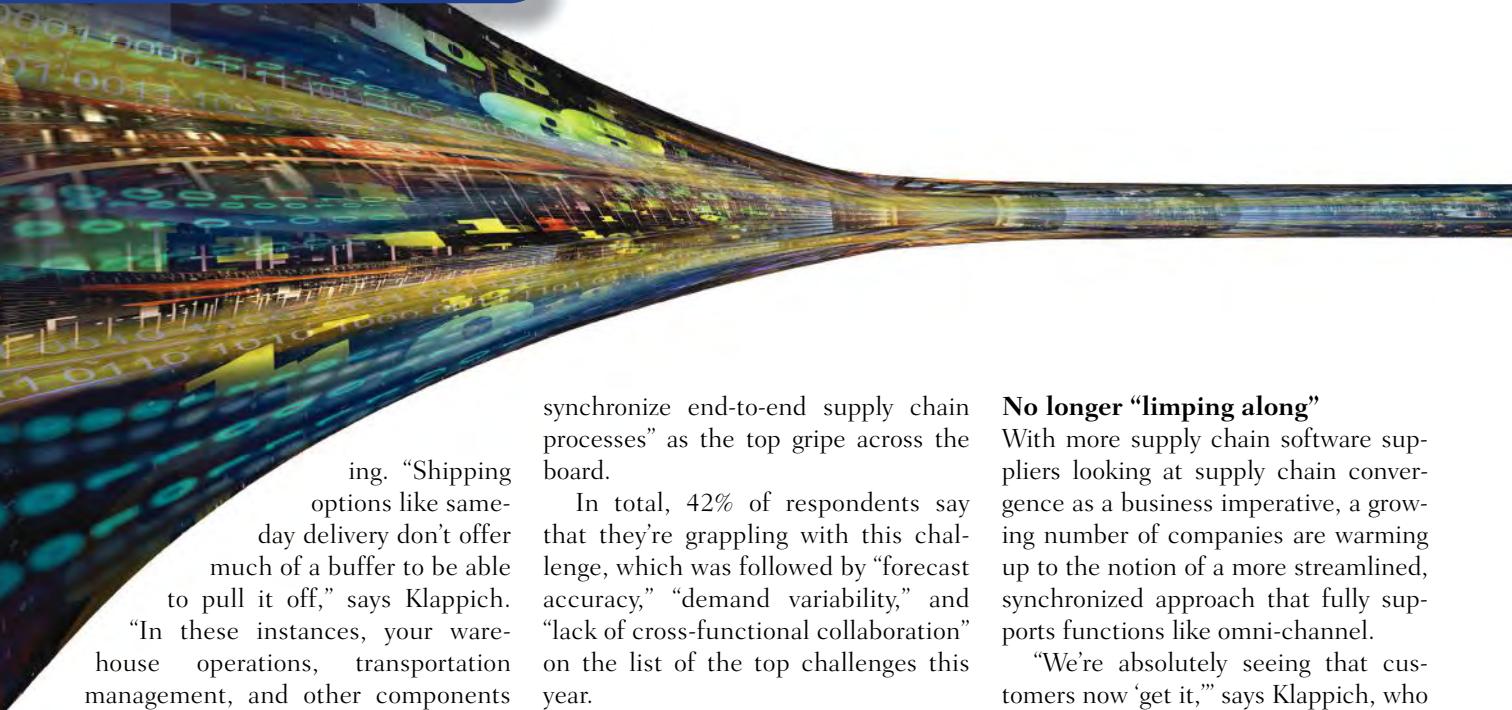
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ing. “Shipping options like same-day delivery don’t offer much of a buffer to be able to pull it off,” says Klappich. “In these instances, your warehouse operations, transportation management, and other components have to be synchronized.”

By that, Klappich means companies have to be able to take an order, identify inventory locations (DC, store, supplier’s warehouse), commit that inventory to the order, and produce the transaction that indicates that this store now needs to ship a single red sweater, size medium, from the supplier in California to a DC in Atlanta and then to a customer’s residence. That’s omni-channel in action, says Klappich, and it plays into the increasing need for supply chain software convergence.

Over the next few pages we’ll better define the meaning of supply chain convergence, show how it’s being put to work, and share how suppliers are stepping up to the plate to offer platforms that work seamlessly with each other to support omni-channel.

### More integration, please

Every year, Gartner conducts a “Supply Chain Technology User Wants and Needs Study” to determine what logistics professionals desire on the technology front and benchmark them against past results. For 2015, Gartner’s eighth year of conducting the study, the research firm identified the “difficulty or inability to coordinate and

synchronize end-to-end supply chain processes” as the top gripe across the board.

In total, 42% of respondents say that they’re grappling with this challenge, which was followed by “forecast accuracy,” “demand variability,” and “lack of cross-functional collaboration” on the list of the top challenges this year.

According to Klappich, supply chain convergence gives companies a way to break through the “difficulty or inability to coordinate and synchronize end-to-end supply chain processes barrier and better synchronize their processes across different functions.”

By eliminating the functional silos that existed among warehousing, transportation, procurement, yard management and global shipping activities, for example, companies can optimize activities across previously siloed functions that didn’t communicate or work with each other.

While some of the push for supply chain convergence is coming from shippers, the suppliers who develop the solutions in question are also helping to drive the charge. According to Klappich, Manhattan Associates is particularly “strong in omni-channel” and is benefitting from the fact that its platform is well suited to supply chain convergence.

“Other vendors are also getting close,” Klappich says, “with the collaboration between JDA and IBM being one indicator of how companies are looking at new ways to support certain processes across the warehouse, transportation, and other aspects of the supply chain.”

### No longer “limping along”

With more supply chain software suppliers looking at supply chain convergence as a business imperative, a growing number of companies are warming up to the notion of a more streamlined, synchronized approach that fully supports functions like omni-channel.

“We’re absolutely seeing that customers now ‘get it,’” says Klappich, who adds that he got a lukewarm response to the idea of convergence when he initially presented in 2009. “It was too early at that time. Companies still needed to get to convergence, but they weren’t ready for it,” says Klappich. “In many cases, shippers weren’t even using transportation management systems (TMS) yet, so they had to get that component up and running before they could worry about some of the other related issues.”

The economic conditions in 2009 didn’t help Klappich’s case for supply chain convergence either. “Shippers weren’t in the position to try anything called ‘bleeding edge’ at that time,” he says. Fast forward to 2015, and the landscape has changed dramatically, with omni-channel almost singlehandedly leading the charge. “Omni-channel commerce has blown the top off the whole concept of supply chain software convergence,” Klappich says. “Without it, the concept would still be limping along.”

For the most part, companies delving into convergence tend to be the early adopters, or roughly 18%, according to Klappich. Such firms tend to have more risk-tolerant cultures, he says, and realize that while a new concept may



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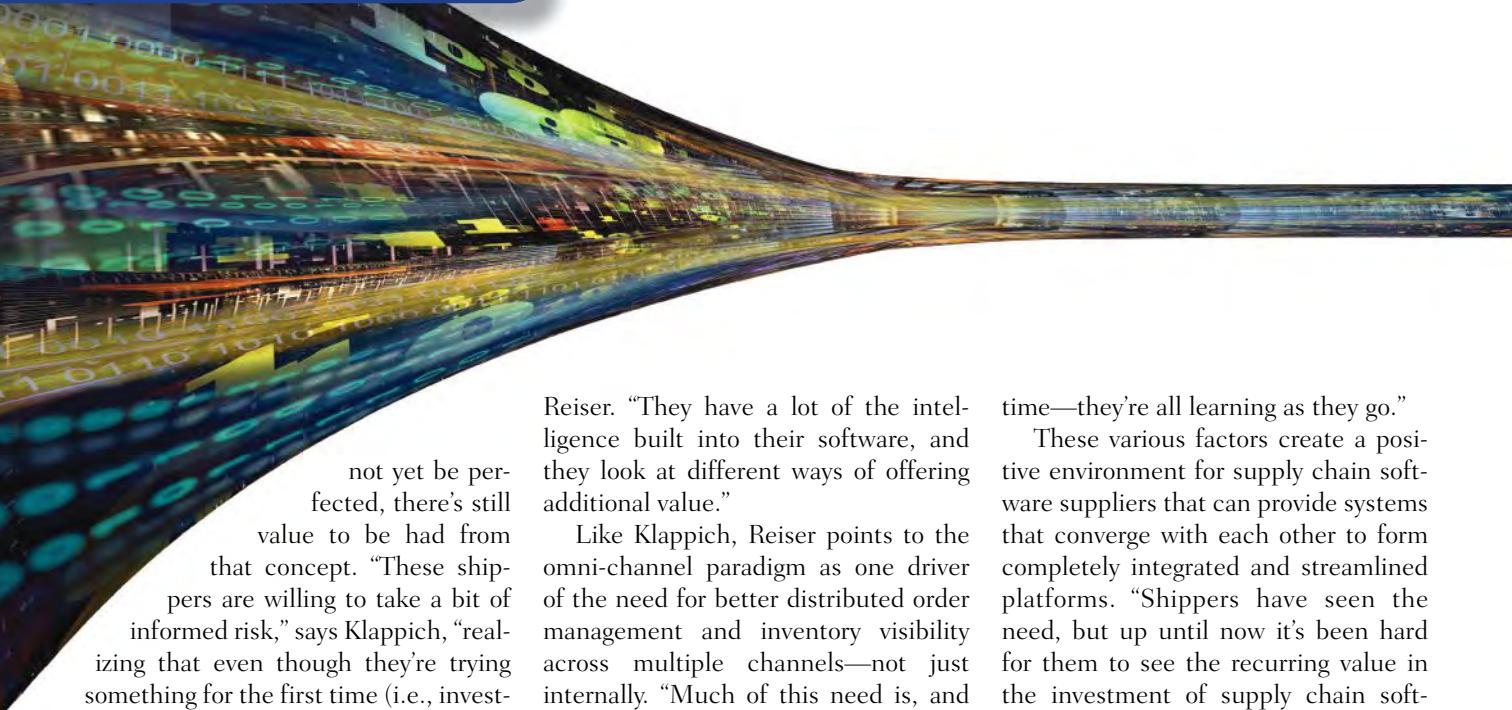


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not yet be perfected, there's still value to be had from that concept. "These shippers are willing to take a bit of informed risk," says Klappich, "realizing that even though they're trying something for the first time (i.e., investing in a piece of technology that may be somewhat untested or unproven within their specific industries), they are doing it for the right reasons."

Clint Reiser, research analyst with Boston-based ARC Advisory Group, says the warehouse is one segment of the supply chain that's ripe for convergence. He points to Intelligrated's acquisition of Knighted Software as a move in this direction, noting that a number of warehouse control system (WCS) suppliers are "incorporating greater functionality into their systems" with such acquisitions.

"There are situations where a WCS takes over control of inventory from a warehouse management system [WMS]," says Reiser, "but Knighted offers both a WCS and a WMS. The integrations are already there, so that's a benefit that it goes to market with." Put simply, the company doesn't have to worry about integrating its WMS and WCS because it's all on a single platform.

In general, Reiser says the concept of integrating applications and breaking down the silos between functional solutions are becoming more important. "Vendors are always looking for a way to compete among themselves, add value, and keep themselves relevant," says

Reiser. "They have a lot of the intelligence built into their software, and they look at different ways of offering additional value."

Like Klappich, Reiser points to the omni-channel paradigm as one driver of the need for better distributed order management and inventory visibility across multiple channels—not just internally. "Much of this need is, and will continue to be, driven by the ongoing need for improved cross-channel inventory visibility and demand planning," Reiser says.

#### Learning as they go

Even with suppliers like Manhattan, Intelligrated, JDA, IBM, and others

**"Omni-channel commerce has blown the top off the whole concept of supply chain software convergence, without it, the concept would still be limping along"**

—Dwight Klappich, Gartner

jumping into the supply chain convergence fray, the progress toward a completely integrated suite of supply chain software applications has been "slow going," says Klappich.

Retailers are on the forefront of the charge due to the omni-channel requirements that they're dealing with, he says. With this in mind, he says IT projects that support omni-channel tend to be welcomed more readily. "No retailer wants to be seen as the company that can't support omni-channel," says Klappich, "and no one really has any best practices at this point in

time—they're all learning as they go."

These various factors create a positive environment for supply chain software suppliers that can provide systems that converge with each other to form completely integrated and streamlined platforms. "Shippers have seen the need, but up until now it's been hard for them to see the recurring value in the investment of supply chain software convergence," says Klappich. "I think they'll soon see that there's going to be a recurring need and that there is value behind it."

Competition among supply chain software suppliers could also help drive the convergence trend over the next year or so, says Klappich, who sees

the traction being made by Manhattan and the collaboration between JDA and IBM as two positive signs in that direction. These early moves could pave the way for more suppliers that want to add value in the area, and that turn to those early examples for proof of concept and value.

"Vendors know that if they don't do something they'll lose ground to their competitors," says Klappich. "This is yet another trend that will help drive traction and momentum around supply chain software convergence over the next several years." □

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# Bastian

SOLUTIONS

Your Total Solutions Provider



### CONSULTING SERVICES

Engineering studies  
System design and simulations  
Supply chain network optimization  
Slotting analysis



### INDUSTRIAL ROBOTICS

Mobile and vision guided  
Palletizing and depalletizing  
Machine tending  
Case packing



### MATERIAL HANDLING AUTOMATION

Conveyor system design and installation  
Automated storage and retrieval  
Picking technology  
Custom equipment



### SUPPLY CHAIN SOFTWARE

Warehouse execution system (WES)  
Cloud-based software



### SYSTEM CONTROLS

Controls design and integration  
Human machine interface (HMI) design  
Panel manufacturing

## The right solution lets you Be...

Faster, smarter, more precise?

Material handling automation is not a one-size-fits-all solution. With your goals in mind, our engineers partner with you to design and integrate the right system for improving your business.

 **888-725-3046**

 [www.BastianSolutions.com](http://www.BastianSolutions.com)



**BUILT FOR IT.™**

For nearly 50 years, customers have relied on Cat® Lift Trucks for quality and reliable forklifts backed by exceptional service and support. With capacities ranging from 2,500 to 36,000 pounds, Cat Lift Trucks delivers fuel-efficient lift trucks for greater productivity and advanced electric forklifts with longer run times and a lower total cost of ownership.

**Keeping your business moving – that's how we're built.**

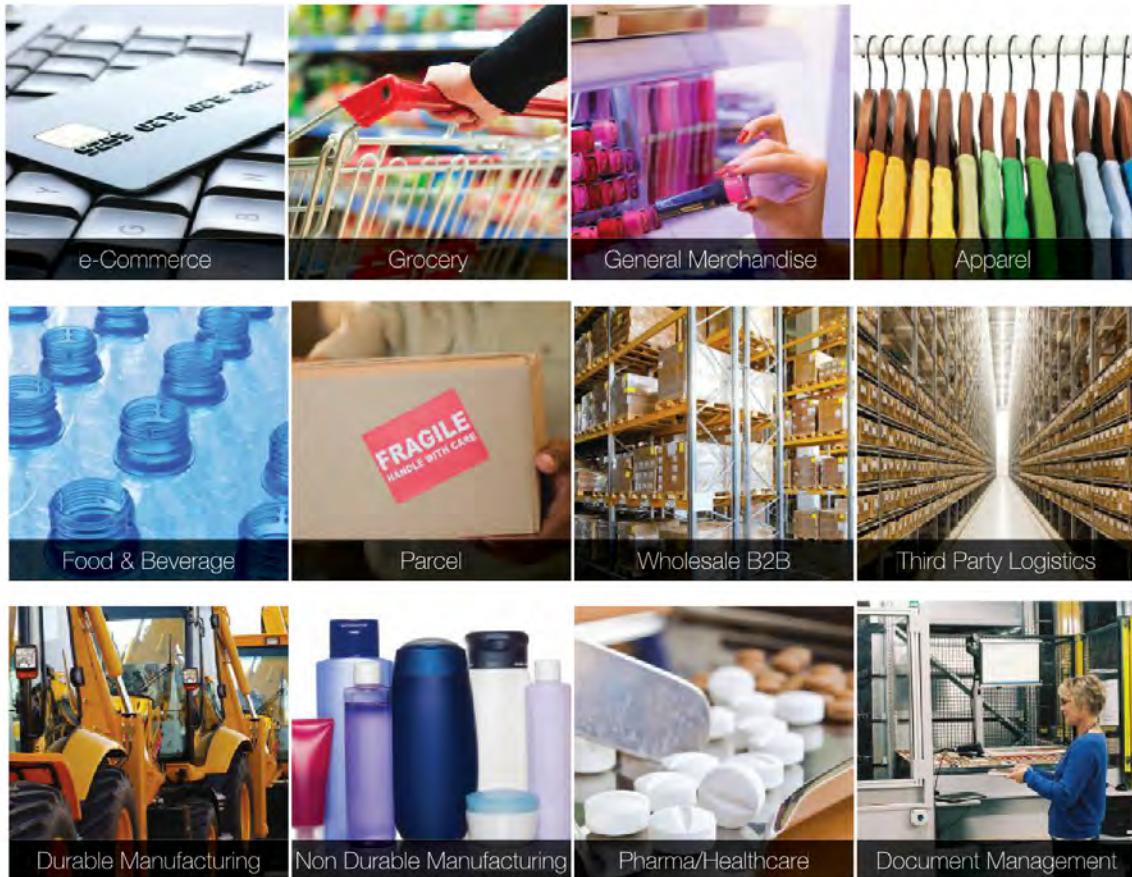
1-800-CAT-LIFT | [www.cat-lift.com](http://www.cat-lift.com)

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**CAT**® Lift  
Trucks

## DEMATIC

We **Optimize** Your Supply Chain



Dematic designs, develops and delivers focused vertical market solutions that optimize supply chains, improve performance and increase productivity.

Coupling industry leading software with state of the art automation, Dematic solutions empower your organization to respond quickly to consumer demand, leverage labor resources and maximize asset and space utilization.

**Optimize your supply chain with solutions by Dematic.**

**Learn more. Visit [www.dematic.com](http://www.dematic.com) or contact us at [usinfo@dematic.com](mailto:usinfo@dematic.com) or 1-877-725-7500 for more information.**

## Welcoming FORTE's Legacy of Excellence and Innovation to Swisslog

For more than 35 years, FORTE has been laser-focused on optimizing distribution centers for many of the fastest growing companies in North America. On April 15, 2015, Swisslog completed the acquisition of this trusted warehouse automation system integrator, establishing FORTE as a separate operating unit.

Founded in 1980, FORTE's business model is to bring a completely objective, equipment-agnostic approach to each systems integration project. FORTE's consulting practice works closely with clients to explore a range of automation solutions and build a solid business case for the appropriate level of automation to be deployed, with services ranging from network analysis and complex data analysis to project design and implementation. FORTE provides mechanical engineering, installation supervision and project management services as well as controls and software to manage sortation, picking and other warehouse management functions.

The FORTE Smart Warehouse Suite™ is a comprehensive warehouse execution software (WES) system, consisting of PLC controls, a warehouse control system (WCS) and discrete, configurable warehouse management system (WMS) functionality, which includes system analytics and business intelligence functionality.

As the new managing director of FORTE, and previous vice president of customer service for Swisslog North America, I'm proud and confident in saying our customers will remain our top priority. With the backing of Swisslog, FORTE will plan, design and implement intralogistics solutions that enable forward-thinking companies to provide the right product to the right place at the right time. Together, we will work with our customers to optimize their operations and help them manage growth.

I know I speak for the entire FORTE team when I say we remain committed to excellence and innovation, and we are excited about the opportunities ahead to provide our collective expertise to help our customers across the globe design, develop and deliver best-in-class automation solutions.

We look forward to working with you to solve your distribution operations challenges soon!



**A.K. Schultz,**  
Managing Director of FORTE,  
a Swisslog Company

To learn more about FORTE, visit <http://www.forte-industries.com>.

### SWISSLOG WAREHOUSE & DISTRIBUTION SOLUTIONS

Swisslog designs, develops and delivers best in class material handling solutions for forward thinking customers in North America.

[swisslog.com/na](http://swisslog.com/na)

**FORTE**  
A Swisslog Company

# ADVANCED

## MOTIVE POWER SYSTEM SOLUTIONS

With more than 85 years of motive power experience and innovation, HAWKER® offers the industry's broadest range of power solution products and provides the experts to turn those system solutions into real cost savings in each operation.

### SINGLE-SOURCE SOLUTIONS

By manufacturing both batteries and chargers, HAWKER® is well equipped to assess and design complete power solutions to enhance each customer's operation.

### BATTERY SOLUTIONS

HAWKER® offers the broadest line of lead-acid batteries, providing solutions for controlling and reducing motive power operating costs.

### MODULAR CHARGER SOLUTIONS

Backed by more than 30 years of high-frequency, smart charging experience, HAWKER®'s innovative modular chargers deliver proven power, advanced scalability, improved efficiency, maximum flexibility, and simplified service.

### ADVANCED MONITORING SOLUTIONS

HAWKER® develops customized monitoring and fleet management systems using a variety of diagnostic tools and reports to streamline customers' fleets and effectively manage their battery charging operation.

### STRONG DEALER NETWORK & SUPPORT

HAWKER®'s extensive network of factory-trained Authorized Sales & Service Representatives serve customer needs by offering on-site training, technical support, product inventory, and scheduled maintenance programs.



### POWER ASSESSMENT SOLUTIONS

HAWKER®'s exclusive on-site Harness the Power Assessment™ is performed to analyze customer operations and provide specific, customized solutions to improve material handling productivity.

Choose HAWKER® for your customized motive power system solutions.

Call **1.877.7HAWKER.**



P.O. Box 808 | 9404 Ooltewah Industrial Drive | Ooltewah, Tennessee 37363 USA  
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# HYUNDAI FORKLIFT DELIVERS INNOVATIVE MATERIAL HANDLING SOLUTIONS

A leader in the lift truck market, Hyundai Forklift manufactures a full line of material handling solutions. Backed by Hyundai Heavy Industries, a leading global corporation, the company has expanded its lift truck product line in North America in recent years.

With its North American headquarters and parts depot located in Norcross, Ga., Hyundai Forklift is committed to offering innovative equipment solutions, great parts availability, quick delivery and timely technical support to its dealers and their customers. Hyundai Forklift has a dealer network of 74 authorized dealers with more than 150 branch locations throughout the United States and Canada.

## Electric

Hyundai offers three-wheel models in 24V and 36/48V (2,200 to 4,000 lb. capacities), four-wheel models in 36/48V with cushion tires (4,000 to 6,500 lb. capacities), and electric pneumatics in 36/48V and 80V models ranging from 3,200 to 10,000 lb. capacities. Units feature LCD color displays and load weight indicators, onboard diagnostics and performance settings.

## Diesel

Hyundai Forklift's high-performance, fuel-efficient diesel forklift trucks, with models ranging from 3,000 to 55,000 lb. capacities, are designed to move heavy loads of materials such as timber, lumber, containers, and concrete and steel products.

## LP internal combustion

Featuring durable Hyundai and GM engines, Hyundai LP cushion forklift models range from 3,000 to 6,500 lb. capacities. Hyundai LP pneumatic forklift models range from 3,000 to 15,500 lb. capacities. Notable features include wet disc brakes, high-visibility masts and Grammar suspension seats.

All Hyundai forklift models are backed by a standard three-year/4,000-hour total truck warranty. For more information about Hyundai Forklift, Hyundai products or dealership opportunities, visit [www.hceamericas.com](http://www.hceamericas.com), or call 877-509-2254.





*Positive feedback...Every time*

**ID Label** was founded in 1994 as a manufacturer of variable barcode products for a variety of applications and markets. Back then only a handful of label companies specialized solely in digital label manufacturing. Pioneers in the industry, ID Label has evolved into an industry leader by constantly expanding our services and print capabilities. Our labeling and identification solutions continue to evolve to keep up with the demands of the industry. Through the years we have earned a national reputation for designing and manufacturing quality barcode labels and signs for the warehousing and distribution market. ID Label is more than a niche label manufacturer. We provide complete turnkey solutions including national installation services unmatched in the industry.



WAREHOUSE SIGNS



RACK LABELS



PREPRINTED LPN LABELS



NATIONAL INSTALLATION SERVICES

## Our Mission

Since 1994, our mission has been to provide the finest products available with zero defects. We accomplish this through our state-of-the-art technologies, superior production staff, knowledgeable sales team and outstanding customer service.

## Customized Solutions

ID Label will help you manage your warehouse by providing you with the tools to utilize your investment in your brick and mortar and your systems and technology. Our warehouse identification products and services will help you organize and allow you to realize your maximum capacity while reducing your lost inventory at a fraction of the cost spent on technology.

- Horizontal and vertical rack/bin location labels
- Preprinted LPN Labels
- Retro-reflective bulk location signage
- 1D & 2D barcodes
- Aisle and dock door signs
- Tote labels
- Beam Renew™ racking cover-up solutions
- BullsEye™ line of bullet-proof, durable products
- Magnetic location labels
- Data file manipulation
- Facility layout & design consultation
- National installation services for ambient, cold or freezer environments



salesmmh@idlabelinc.com | 800.541.8506 x108 | [www.idlabelinc.com](http://www.idlabelinc.com)

KPI Scorecard

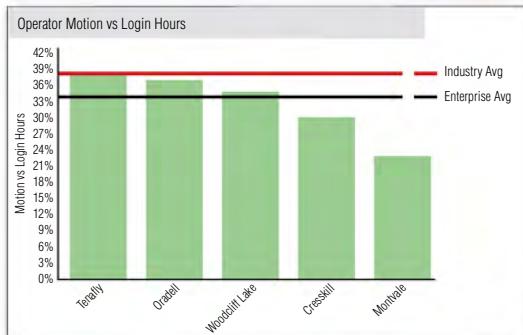
Compliance Impacts Vehicle Productivity by Site Vehicle Productivity Comparison

KPI Scorecard Trends

1 - KPI Scorecard by Metric

Bypass Motion Rate High/Severe Impact Rate Lockouts for Critical Rate Operator Utilization Non-Compliance

Site	Vehicles	Rolling 7 Day	7 Day Alert	7 Day Rank	30 Day Trend
Tenally	107	1.10	●	3	→
Cresskill	125	0.24	●	1	→
Demarest	143	90.87	●	10	↑
Closter	96	10.66	●	6	→
Norwood	117	7.14	●	5	→
Old Tappan	99	0.48	●	2	→
River Edge	112	13.37	●	8	→
Oradell	98	13.21	●	7	→
Montvale	108	15.97	●	9	→



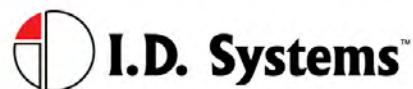
## Best Practices to Improve Material Handling Fleet Performance

**I.D. Systems** is a leading global provider of wireless solutions to connect supply chain assets to the Industrial Internet of Things.

The company's PowerFleet® Vehicle Management System (VMS) is a best-practice technology – adopted by over half of the Fortune® 200 with lift trucks – to improve safety, reduce costs, and increase productivity in material handling operations.

PowerFleet provides unique, best-in-class, patented technologies for:

- Operator access control, to establish total accountability for equipment use
- Electronic vehicle inspection checklists, to ensure compliance with safety regulations
- Impact detection and automatic response management, to reduce damage costs
- Vehicle activity metrics, such as simultaneous usage and travel with/without load, to optimize fleet utilization and “right-size” fleets
- Data analytics, to establish key performance indicators (KPIs) for material handling assets, compare site performance against enterprise and peer-industry averages, identify trends and opportunities for improvement, and track the ongoing value of VMS for material handling operations.



201.678.5565 • [www.id-systems.com](http://www.id-systems.com)



# PUT PRODUCTIVITY ON THE FAST TRACK



## Material handling automation

- Case, tote & polybag conveyor
- Pallet conveyor
- Sortation systems
- Palletizers & depalletizers
- Robotics
- AS/RS solutions



## Warehouse execution systems

- Voice, light picking & putting technologies
- Labor management software
- Business intelligence
- Mobility & wireless
- Conveyor & sortation controls



## Lifecycle support services

- Technology refresh
- Equipment modifications
- Maintenance & system assessments
- Spare parts strategies
- Track-driven training programs



automation that **delivers**™

**I**ntelligrated®



As one of the leading manufacturers in the storage systems market, Interlake Mecalux offers its customers the broadest array of storage products in the world. Since our foundation more than 50 years ago, Interlake Mecalux has been providing comprehensive, turn-key answers to today's complex material handling and logistics needs.

Interlake Mecalux provides storage solutions with an array of products including standard and dynamic rack, automated storage and retrieval systems, vertical storage solutions, and warehouse management software. With 11 production plants worldwide (3 of them in the U.S. and 2 in Mexico), Interlake Mecalux is by far the largest supplier of storage racks in North America and we ensure the highest quality products in the industry.

The primary markets served by Interlake Mecalux include companies that operate full-scale distribution centers, warehouses of all sizes, manufacturing facilities, and archive and record storage environments.

TEL. (877) 632-2589 – [www.interlakemecalux.com](http://www.interlakemecalux.com) – [info@interlakemecalux.com](mailto:info@interlakemecalux.com)

# Lenze

Lenze Americas, based in Uxbridge, MA, is a subsidiary of Lenze SE in Germany, a global leader in industrial automation systems. As a manufacturer of electrical and mechanical drives, motion control and automation technology, Lenze offers products, drive solutions, complete automation systems and engineering services and tools from one single source. Lenze's solutions are found in many material handling applications: roller and belt conveyors, rotary and scissor lift tables, lifting stations, palletizing systems, storage and retrieval units, monorail overhead conveyors and AGV systems. Our drive and automation solutions guarantee a smooth connection to any upstream or downstream system - steady or dynamic, lifting or lowering, moving or positioning - increasing the productivity of your logistic systems.



## Lenze's Recent Innovations:

**Lenze Smart Motor** – fully programmable from a smart phone, it blends the simplicity of a conventional AC motor with electronic drive control technology - freely adjustable speeds, programmable I/O and integrated functions for conveying needs.

**g500 gearboxes** – designed for mechatronic integration with the Lenze Smart Motor and developed to transform motor speed into torque as intelligently and accurately as possible.

**Easy-to-integrate for material handling assemblers**, compact g500 gearboxes and the innovative Smart Motor run cooler and more energy efficiently for optimal performance in a wide range of conveying and other material handling applications.



**The Smart Motor**, in tandem with the g500 gearboxes, offers a single, efficient motor with numerous integrated functions for material handling applications, including higher starting torque and adjustable preset speeds between 500 and 2,600 RPM, which reduces the required numbers of geared motor combinations by up to 70 percent. The compact Smart Motor meets the highest requirements in energy efficiency and can be conveniently operated using an NFC-capable smart phone.

Lenze Americas, 630 Douglas St., Uxbridge, MA 01569 USA  
 Toll Free Number: 800-217-9100, Tel: 508-278-9100  
 E-mail: [info@lenzeamericas.com](mailto:info@lenzeamericas.com), Website: [www.Lenze.com](http://www.Lenze.com)

# Lenze

As easy as that.



AirVolution<sup>D</sup>

## Air Has Evolved – MacroAir Reinvents the HVLS Fan

In 1998, MacroAir invented (HVLS) high volume low speed fans – a huge fan with blades spanning 24 feet instead of the typical 2 feet. After spending over a decade perfecting HVLS fan technology, MacroAir has re-invented the HVLS industrial fan category with its new product line AirVolution-D. MacroAir's AirVolution-D is powered by a breakthrough in motor technology, called D-Drive, which is the world's first compact electric motor capable of handling the consistent torque requirements of a 24-foot diameter industrial fan. At the heart of AirVolution-D is an innovation in motor design, delivering 50% more mechanical horsepower and 75% more windpower than current HVLS fans on the market.

Our gearless motor eliminates the need for a massive gearbox, slicing 45% of the weight and

eliminating numerous moving parts. AirVolution-D is the most reliable, most efficient, lightest, quietest, smoothest HVLS fan line on the market today. Fans are available in sizes from 6 to 24 feet, allowing MacroAir fans to go into more spaces than ever before. AirVolution-D can be installed in as low as 12-foot ceiling heights and offers custom color options, blending into the aesthetic of virtually any space. "MacroAir invented the HVLS fan, so it's only fitting that MacroAir would be the company that reinvents it," said Eddie Boyd, president of MacroAir. "AirVolution-D is the most cost-efficient fan we've ever built because everything from installation, to operation, to maintenance costs have been dramatically improved. It creates a more comfortable and healthy environment for employees

and customers in spaces like warehouses, offices, restaurants, public spaces and farms. The applications are endless."

AirVolution-D is currently available in four model options: 370, 550, 780 and AVD3. MacroAir fans are trusted by companies such as Coca-Cola, CSX Transportation and NAPA Auto Parts, and the company is the exclusive HVLS fan supplier for independent auto dealerships of BMW, Chrysler, Ford, General Motors, Lexus, Mercedes-Benz, Nissan and Toyota under their Dealer Equipment Programs.

To explore MacroAir's line of HVLS fans, visit [www.macroairfans.com](http://www.macroairfans.com) or call (866) 668-3247.





George W. Prest, CEO  
MHI



## The Industry That Makes Supply Chains Work®

The increasingly integrated and globalized economy has redefined the dynamics of success for modern organizations. The complexity of managing supply chains that span continents and dominate markets demands agile and adaptable strategies, equipment and systems.

Success depends on effective material handling, logistics and supply chain solutions that deliver the right product to the right market at the right time in the most efficient and cost-effective way.

MHI is the trade association leading this vital industry. MHI members are material handling, logistics and supply chain equipment and systems manufacturers, integrators, third party logistics providers, consultants and publishers.

Their membership in MHI reflects an ongoing commitment to the increased safety, productivity and profitability of manufacturing and supply chain operations.

Visit [MHI.org](http://MHI.org) to learn more about our members and the solutions they offer.

### MODEX 2016

In April 2016, more than 800 of the top material handling, logistics and supply chain providers will fill 250,000 square feet of the Georgia World Congress Center at MODEX to demonstrate their equipment and system solutions in a face-to-face environment.

Buyers and professionals in all areas of manufacturing and the supply chain come to MODEX to learn and network – to sharpen their skills and get ahead of the curve. The MODEX Supply Chain Conference provides industry-leading networking and educational opportunities, one-of-a-kind keynotes and more than 100 educational seminars to help them evaluate and implement the solutions they find on the show floor.

For the supply chain, MODEX is where it happens. It's where people with buying power come together to find the equipment, software and systems they need and where professionals go to build community and learn with their peers. If you work in the supply chain, you need to be at MODEX.

Visit [MODEXShow.com](http://MODEXShow.com) to learn more and register to attend.



8720 Red Oak Blvd., Suite 201 | Charlotte, NC 28217-3993 | 704-676-1190 | [www.MHI.org](http://www.MHI.org)



Innovative Storage and Retrieval Solutions

*We shall strive to expand the boundaries of technological advancements, provide meaningful products that enrich the lives of our customers, bring prosperity to each of our employees, and lead society to a better tomorrow.*

Murata Machinery (Muratec) has been a global market leader in the design, manufacture and implementation of Automated Material Handling Systems (AMHS) for over 50 years. We have extensive experience in storage, transportation, sortation and warehouse control systems within distribution, manufacturing and clean room environments. Muratec has installed approximately 14,000 storage/retrieval cranes (ASRS) and 3,500 automated guided vehicles (AGV) in over 11,000 systems within the following industries: agriculture, air cargo, automotive, beverage and bottle, chemical, cold storage, food, electronics, pharmaceuticals, paper, printing and publishing, semiconductor, solar/photovoltaics, specialty retail and textile.



For more information, please contact our National Sales Manager at [todd.jedelsky@muratec-usa.com](mailto:todd.jedelsky@muratec-usa.com) or visit [www.storageandretrievalsystems.com](http://www.storageandretrievalsystems.com)

Murata Machinery focuses on multiple industries including:

- Tire & Rubber
- Automotive
- Food and Beverage
- Library/Education
- Industry/Manufacturing
- Specialty Retail
- Pharmaceutical

### Solution Focused

Logistics (strategic distribution) is now the key element of corporate strategy. Murata Machinery promotes logistical solutions that are directly linked to corporate operations from the perspective of SCM (supply chain management), representing the optimization of a continuous flow from purchase of raw material to delivery of merchandise to final consumers. From analysis of throughput, workflow and business process, trouble spots and areas of improvement can be identified and incorporated into an optimal solution.

Laying down plans for improvement in various levels of business from corporate strategy to operations calls for the introduction of new systems. Murata Machinery is your partner in developing a grand logistics design incorporating site planning, outsourcing, overseas deployment, and others to provide optimal solutions for your business needs.



# YOU SELL. WE SUPPLY.



**Products For Industry : The Business Behind Your Business**



On any given day, how much of your time do you really spend focusing on your core business? Too often, much of our day is filled with non-productive time consuming tasks.

At PFI, we understand. As the nation's largest material handling and storage equipment full service wholesale distributor, we have the expertise, infrastructure and services to enable your company and sales team to operate more efficiently and effectively.

With PFI, you are free to focus on what you do best, selling and servicing your customers.

**We provide you with:**

- 50,000 Products
- Extended 3-Year Warranty
- Same-Day Shipping
- Exceptional Customer Service

*Discover a more efficient way of doing business. Discover PFI!*



Shelving & Racks



Bins & Container Storage



Shop Equipment



Trucks & Carts



Warehouse Equipment



Environmental & Safety



Handling Equipment



Cabinets & Lockers

Let Us Help Your Business  
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[www.ProductsForIndustry.com](http://www.ProductsForIndustry.com)

**F** 800.336.6608

## Warehouse Control Systems Software and Controls.



### TAKE CONTROL OF YOUR SUPPLY CHAIN.

Pyramid, a Mattheus Automation Solutions brand, is a leading provider of high-performance control solutions for new material handling automation deployments and retrofits of existing systems. Our programmable logic controller- (PLC) based controls, Pyramid Director warehouse control system (WCS) software, or combinations of both optimize a wide array of equipment types, manufacturers' brands and applications including:



- Loop sorter controls and re-control including tilt-tray, bombay and cross-belt.
- Package conveyor controls including traditional, belt and motor-driven roller (MDR).
- Case sorter controls including slat/shoe, pop-up wheel, swivel wheel, transfer and more.



- Pick automation including pick-to-light, voice and radio frequency (RF).
- Put walls and pods for light-directed sortation.
- Automated storage and retrieval (AS/RS).
- Vertical and horizontal carousels.
- In-motion weighing, dimensioning and marking systems.



- Auto-identification/data capture (AIDC), bar code scanners, scan tunnels, cameras and RFID.
- Print and apply for compliance labeling.
- Order finishing systems including auto-box, auto-bag and auto-document insertion for packing slips, marketing collateral and more.

We seamlessly integrate and synchronize islands of order fulfillment technologies and material handling equipment with our centralized, real-time controls solutions. For more than 20 years we've helped many of the world's top brands improve flow, increase accuracy and decrease order cycle times. Learn how we can help you extend the functionality of your current automation investments, or transform your processes to meet changing business needs and take control of your supply chain.

513.679.7400

[sales@pyramidcontrols.com](mailto:sales@pyramidcontrols.com)

[pyramidcontrols.com](http://pyramidcontrols.com)

## WE DON'T MAKE CONVEYORS – WE MAKE CONVEYORS RUN **BETTER**

### Sealmaster® Material Handling Bearings and End Caps

Features cast iron housings, an extended inner race insert bearing with ball riding nylon retainer, and an insert to prevent outer ring rotation. Available in a variety of popular housing and locking styles, including pillow block, flanged, tapped base, hanger and take-up.

Sealmaster End Caps offer excellent protection against high-pressure wash down to reduce bearing moisture contact, as well as personal protection in order to conform with OSHA and other regulatory guidelines. Snap on or bolt on end caps available, both with incorporated drain holes to reduce moisture buildup.

### System Plast™ Valu Guide™ SpeedSet™ and BeadRail™

Ideal for maintenance cost savings and downtime reduction. SpeedSet brackets solve conveyor line change-over problems quickly, by providing tool-free fast and accurate adjustments. The innovative brackets are simple to use and customizable to individual product requirements.

### System Plast NG™ evo

Broadens sustainability opportunities in standard material handling by reducing energy consumption and noise, while allowing the elimination of soap and water lubrication for dry, high-speed conveying on FDA approved proprietary thermoplastic resin. This advanced, low-friction concept is a smart choice to help meet water conservation goals.

### Hub City HERA®

The 21st century replacement of industrial worm-gear drives, providing 90 percent efficiency in all ratios for up to 40 percent reduction in energy requirements with a 3-year warranty. Torque-dense with double the capacity of worm drives, HERA drives reduce motor size requirements, as well as the physical size of the drive package.

### Grove Gear LeCentric

Torque rated up to 18,587 lb-in with removable bases and flanges that allow field configuration for drop-in replacement of industry standard reducers. LeCentric helical in-line reducers offer advantages for OEM and MRO applications, with quick delivery, high levels of customization, and the cost effectiveness of pre-assembled GEAR + MOTOR units.

### McGill® CRES Cam Followers and Heavy Duty Cam Followers

CRES (Corrosion Resistant Engineered Solutions) bearings are engineered with special materials and patented sealing systems to meet material handling requirements for higher speeds, long life, and low maintenance in dry, wet or corrosive environments.

Heavy Duty Cam Followers offer full complement cylindrical roller bearings, featuring black oxide treated bearing steel, and the best antifriction solution for translating rotation to linear motion. Ideal for case packers, palletizers, fillers, cappers, unscramblers and similar food/beverage equipment.

**GROVE GEAR**



**McGILL**

**SEALMASTER**

**SYSTEM  
PLAST**



A Regal Brand

**REGAL**

www.regalbeloit.com

For more information on Regal Power Transmission Solutions products and services, visit [www.RegalPTS.com](http://www.RegalPTS.com).

# Material handling, Accelerated

with Rice Lake quality and legendary support.

## Rice Lake Weighing Systems

Rice Lake Weighing Systems is an international leader in the manufacture and distribution of weight-related, measurement and process-control equipment. Our roots are planted firmly in the principles of quality and customer service. Through three generations of family ownership, these ideals remain unchanged. Today, Rice Lake is world renowned for delivering the highest standard of product and the best service in the weighing industry.

Rice Lake offers many products for the material handling industry to speed up applications, and ultimately save material handling process time and money. Our CLS Cargo Lift Scale saves operator time, reduces equipment costs and eliminates the middle step by allowing forklift operators to lift, weigh and transfer cargo in one easy motion. Our line of iDimension™ 3D dimensioning products provide the material handling industry with the fastest and most versatile dimensioning systems on the market. Easily integrated into existing work stations in warehouses, manufacturing lines, and shipping and receiving areas, iDimension calculates accurate parcel dimensions in 0.2 seconds or less. iDimension systems can be used in many material handling applications, always with the goal to ensure dim weight compliance and deter revenue-loss from miscalculated dimensions.

At Rice Lake, we offer an extensive line of weight-related, measurement and process control equipment for material handling operations, as well as many diverse industries and markets across the world. From community involvement to global commitment, our dedication to being the best by every measure extends to every facet of our business.



CLS CARGO LIFT SCALE



DIMENSIONING





## Move it better.



**F**ounded in 2007, RM2 is a vertically integrated innovator that specializes in pallet design, manufacturing, supply and management. We are a supply chain solutions provider that works with customers to understand the challenges within their logistics systems.

Our approach is to present any supply chain with a solution that is right, measurable and manageable across economic, quality and sustainability criteria. We do this by delivering key advantages of a revolutionary composite pallet and advanced tracking and optimization systems.

- Improve the Quality within your Supply Chain
- Achieve Sustainability Goals
- Control Costs

BLOCKPal™ is a robust composite pallet independently tested to ISO 8611 standards. It is designed for use in all mainstream automated and manual areas of the supply chain.

Precisely made from a composite material, the BLOCKPal is pound for pound stronger than steel, making for a reusable shipping pallet that lasts longer than any equivalent product.

The BLOCKPal is non-porous and sterile, easy to clean and free from the need for any controversial chemical treatments. The BLOCKPal is a cost effective and revolutionary opportunity.



### Durable

Lasts 20 times longer than wood; requires only 1/5 of BLOCKPal pallets to deliver the same number of product as a traditional pallet.



### Hygienic

Non-porous surface is resistance to chemicals, bacteria and moisture. Compliant with USFDA Food & Drug specifications, Generally Recognized as Safe (GRAS) and equivalent to EU standards.



### Fire Resistant

Accredited to Factory Mutual 4996.



### Sustainable

Minimize carbon footprint and achieve sustainability goals.

### Industries Served

- Food & Beverage
- Packaging
- Automotive
- Pharmaceuticals
- Fast Moving Consumer Goods
- Industrial Chemical
- High Tech
- Automated Storage and Retrieval System

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**50% EASIER TO LIFT LINERS**

The vented BRUTE® container makes backbreaking work easy with innovations you (and your back) will appreciate.



**BUILT IN VENTING CHANNELS**



**CINCHES KEEP BAG FROM FALLING IN**



**BRUTE®**

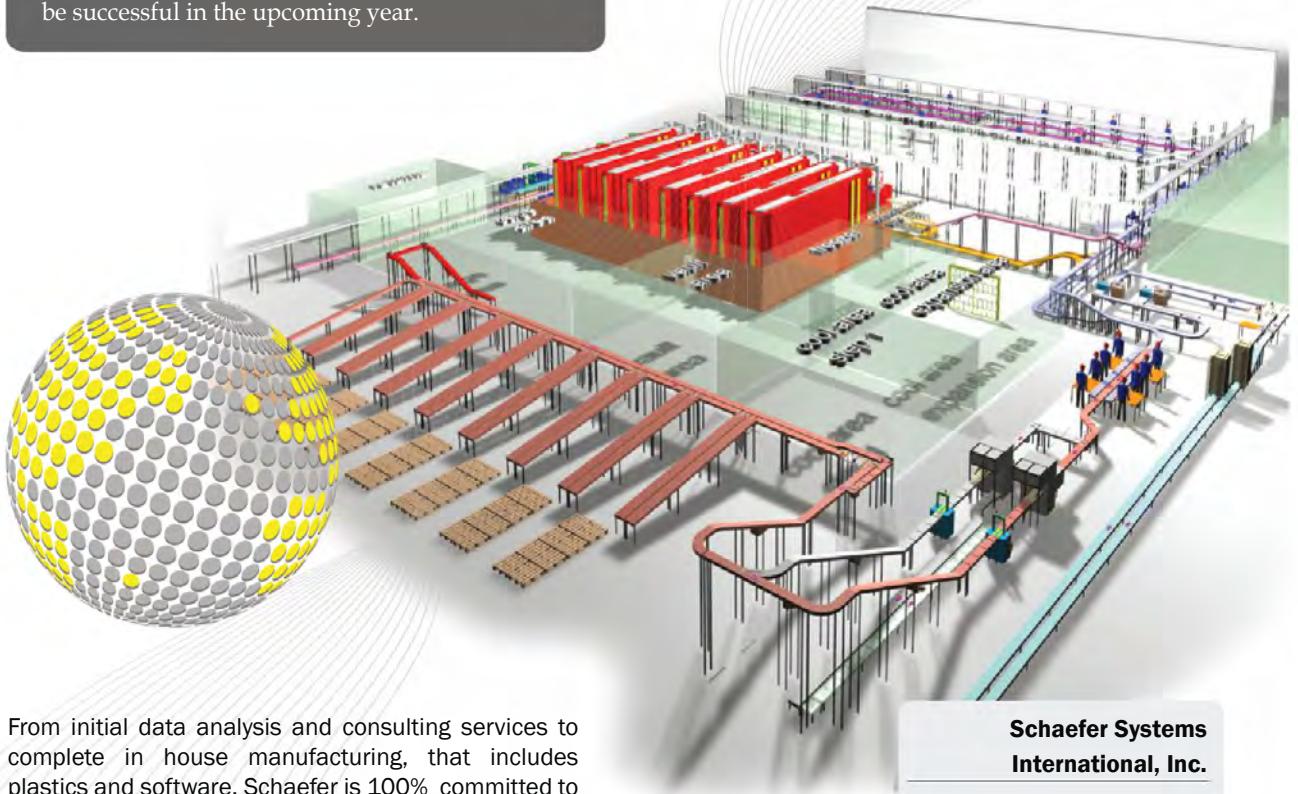


The Schaefer team remains committed to providing our clients with unconventional picking and storage solutions. What differentiates us from the competition is our commitment to working closely with our clients to thoroughly understand their operational data, offering a better return on investment.

As the need for reducing the footprint of the operation floor space continues to increase, the need for developing solutions that include buffering or sequencing systems to feed goods-to-person picking is imminent. Schaefer's MATRIX approach will allow us to continue to help customers meet this demand and ultimately be successful in the upcoming year.

Schaefer Systems International, Inc. provides clients state of the art picking and storage solutions in all types of industries. Our technology allows us to increase efficiency by generating more throughput and making better use of land and cubic space as well as make distribution centers more energy and labor efficient.

Schaefer Systems' automation integrates into any existing system, which has earned us an international reputation as the global leader in the material handling industry for returnable packaging, static racking, and highly complex, automated intralogistic systems.



From initial data analysis and consulting services to complete in house manufacturing, that includes plastics and software, Schaefer is 100% committed to delivering the best value solution to its customers.

Headquartered in Charlotte, North Carolina, Schaefer is part of the SSI SCHAEFER group, a global leader in logistics & material handling founded in 1937 with offices and plants in over 60 different countries.

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Charlotte, NC 28273  
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Established in 1949, Vanderlande has more than 3,300 employees, all committed to moving its customers' business forward at diverse locations on every continent. With more than \$1 Billion in sales in North America, an extensive portfolio of integrated solutions, companies rely on us to help them meet the fulfillment demands of their customers'.

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**MOVING YOUR BUSINESS FORWARD**

## **COFE® Makes Omnichannel History**



VARGO®'s Continuous Order Fulfillment Enterprise (COFE®) is the first intelligent Warehouse Execution System (WES) that processes orders without waves for distribution centers. On June 15, 2015, American Eagle Outfitters went live with the first all-waveless omnichannel facility driven by COFE®. COFE® is capable of managing material handling equipment as well as devices, people and processes. Its demand-driven technology integrates and synchronizes the distribution center to position workers strategically with the operation of the equipment.

### ***Pioneering the omnichannel trail***

In 1999, VARGO® installed the first fully waveless facility in North Hampton, UK. Levi Strauss still operates that facility, which uses automated equipment to pick orders, for European distribution. Then, in 2004, VARGO® deployed a “continuous flow” system to L.L. Bean. In 2006, VARGO® commissioned American Eagle Outfitters’ first waveless e-commerce WES at American Eagle’s Kansas facility. That facility uses VARGO®’s COFE® WES to provide a continuous flow of product through the outbound process. In 2015, VARGO® provides American Eagle’s Pennsylvania facility with a true omnichannel fulfillment process driven by its COFE® WES.

### ***Balancing labor and optimizing orders***

COFE®’s many tools set it apart:

- Dynamic system-directed labor balancing across multiple work zones
- Live item sorting optimization
- Real-time management of next order to release
- Revolving batch picking
- In excess of 150 reporting and management tools

### ***Providing a scalable, fast solution***

COFE® fills the gap where traditional retail-centric methodologies and systems fail. A highly intelligent WES, COFE® synchronizes and sequences work by pulling work to the available resources (people and machines). Using this methodology, VARGO® removes the need for costly buffers and complex waving disciplines. It also offers a variety of modules that allows it to customize COFE® for a customer’s specific applications.

### ***Pulling equals lean distribution***

Smart distribution requires smart thinking. Smart thinking requires a smart WES. COFE® is a real-time WES that automates wave planning and enables continuous picking for a true lean and smart distribution center. With COFE® in command, companies will realize the following benefits of an end-to-end lean system that:

- Dynamically adapts to varying order profiles
- Immediately activates priority order
- Maximizes worker efficiency
- Eliminates waving and buffers
- Reduces order cycle times
- Increases equipment utilization

### ***Realizing real-time results***

The most innovative retail market leaders are experiencing record-breaking results after installing COFE® in their distribution environments. VARGO®’s design for an American Eagle Outfitters’ facility and the addition of VARGO®’s software have improved performance results AEO has seen its costs for direct-to-consumer distribution are down considerably.

### ***Offering a SaaS pricing structure***

VARGO® now offers COFE® Software as a Service (SaaS), a new pricing structure geared toward small- to medium-sized retailers and third-party logistics providers. COFE® SaaS enables smaller companies to take advantage of the COFE® technology and reduce the large capital investment typically required to implement a WES.

***To see the power of COFE, call us at 877.876.6384 for a demonstration.***

### ***Why VARGO®?***

To thrive and exceed your customers’ expectations, you must innovate and adapt. We can help you do that by using our proven and recognized approach to processing orders in your distribution center using our pull-based, waveless methodologies.

VARGO® is one of the largest material handling and logistics integrators in North America. For more than four decades, VARGO®’s team of specialists—with expertise in systems integration, distribution center process improvement and specialized material handling equipment—has been working with some of the largest and best-in-class distributors of online goods. It works with retailers, manufacturers, wholesale and direct-to-consumer distributors to improve material handling operations and move beyond traditional distribution methodologies. At the forefront of the lean distribution movement, VARGO® is the only company that offers COFE® software, the tool that makes true lean distribution possible.



### ***Maximizing Resource Utilization***

VARGOsolutions.com

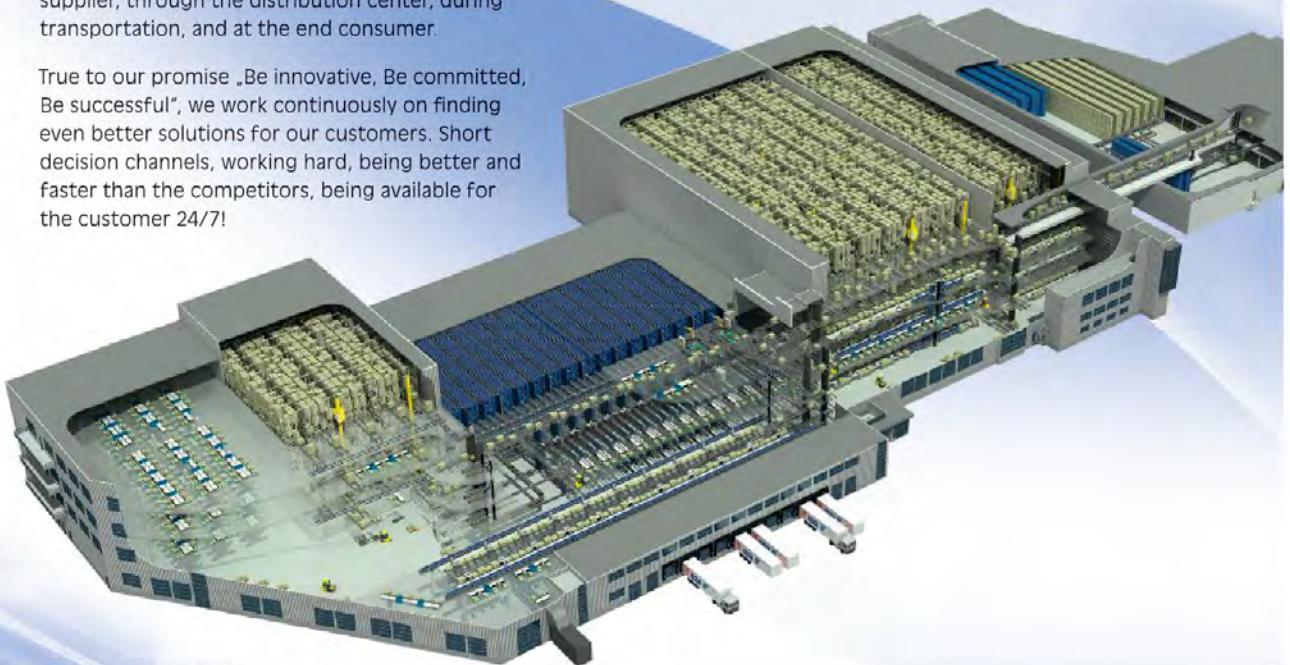
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#### WITRON has all the decisive elements for successful project realization under one roof:

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- individual service and operator models

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## Mopping system bucket engineered to prevent splashes

The WaveBrake family of mopping systems may be specified in sizes from 26 to 44 quarts. The bucket includes molded-in wave brakes to reduce splashing by up to 40%, preventing slips and falls. To reduce worker back strain,



the 44-quart model incorporates a foot pedal water release mechanism to drain the bucket without lifting. The mopping systems can be equipped with either down press or side press wringers and an optional dirty water bucket that collects water from the wringer, preventing it from being returned to the cleaning solution. Some models incorporate a connection pin that allows them to be linked to a cleaning cart. **Rubbermaid Commercial Products, 800-347-9800, [www.rubbermaidcommercial.com](http://www.rubbermaidcommercial.com).**

## Built-in wear indicator signals tire change needed

Incorporating an embedded orange line, the Pit Stop Line of solid lift truck tires eliminates uncertainty about tire wear and replacement timing. The indicator reveals itself across the surface of the tire when it reaches the point where it should be replaced. This ensures that tires are not changed too early (wasting usable tires),



or too late (compromising safety). Because the indicator is engineered to appear 100 hours—or five to 15 working days—before the tire needs replacing, operators and facility managers can plan tire changes in advance, avoiding unplanned downtime. **Trelleborg Wheel Systems Americas, 866-633-8473, [www.trelleborg.com/wheelsystems](http://www.trelleborg.com/wheelsystems).**

## Battery-powered, ride-on floor sweepers are emissions free

Three new emissions-free, ride-on floor sweepers clean floors in industrial facilities, manufacturing plants and logistics centers. Battery-powered, the KM 105/110 R Bp, KM 130/300 R Bp and



KM 150/500 R Bp can be configured to meet a variety of cleaning applications. The sweepers feature hydraulic forward drive for improved maneuverability with 360-degree turns in hallways and narrow aisles; a crescent-shaped side brush that engages automatically when turning corners to clean in one pass; and a filter cleaning process that blows air through the machine's filter, removing contaminants and ensuring a high filtration levels. Additionally, the KM 105/110 model includes an intelligent keyed operator system that limits machine operation to a selectable range of functions for different cleaning needs based on who is accessing it. **Kärcher North America, 888-805-9852, [www.karcher.com/us](http://www.karcher.com/us).**



## Rechargeable, cordless floor cleaner/scrubber

Powered by a rechargeable lithium-ion battery, the cordless OmniFlex AutoVac automated floor cleaning machine is ideal for scrubbing hard surfaces. It cleans more than 20,000 square feet of flooring per hour and is 85% less expensive than a similarly sized autoscrubber. In independent testing at the University of Massachusetts, the unit removed 99.8% of targeted soil, more than either an autoscrubber or a microfiber mop. The machine uses very few moving parts making it easy to maintain, troubleshoot and fix without a service technician. It holds 10 gallons of solution and cleans a 28-inch width. Features include an 11.5-gallon-capacity, see-through vacuum tank; a 15-foot slinky vacuum hose; parking brake; two 3-inch casters; and two 5-inch wheels for mobility. **Kaivac Cleaning Systems, 800-287-1136, [www.kaivac.com](http://www.kaivac.com).**

## National aftermarket services for secondary packaging equipment

SupportPro's nationwide field service network provides aftermarket services to owners and manufacturers of secondary packaging equipment. The company supports equipment—including shrink wrappers, robotics, stretch wrappers, palletizers, cartoners, horizontal form-

ers, case packers, check weighers, case and pallet conveyors, case coders, case erectors, labeling systems, scales, metal detectors and more—with spare parts, remote equipment monitoring and a 24/7 hotline. To extend the life of equipment, a series of productivity and performance audits and retrofit packages are also offered. **SupportPro, 844-777-8776, [www.supportpro.pro](http://www.supportpro.pro).**

## Thermal imager draws attention to areas requiring further review

The ultra-high sensitivity Heat Spy 170 thermal imaging camera offers a thermal view setting that reveals only the temperatures above or below a given set point. Ideal for electricians, plumbers, building inspectors and facility managers, this function overlays the thermal signature on a visible light image to emphasize temperatures of interest and areas requiring further assessment. A thermal and visible video recording feature documents temperature surveys in any of the imager's four viewing modes, storing files on the included 8-gigabyte SD card. For file transfer, the device has integrated Bluetooth connectivity and can be paired with a headset to record and play back audio image annotations hands-free. Other highlights include a 384 x 288 pixel detector, a 3.6-inch LCD touchscreen display, 25 x 19 degree field of view, and integrated dual LED bulbs that can be used as a flashlight when needed in low-light conditions. **Palmer Wahl, 800-421-2853, [www.palmerwahl.com](http://www.palmerwahl.com).**



## Cloud-based management of LED lighting maximizes efficiency, use

The LightRules energy platform adds intelligence to LED lighting systems in commercial applications, enabling facility managers to boost lighting efficiency, control and use. Cloud-based, the system shares detailed metrics on lighting and building key performance indicators in individual or multiple facilities. With the addition of digital light agent stand-alone controls, any fixture type from any manufacturer can be integrated into the LightRules system. **Digital Lumens, 617-723-1200, [www.digitallumens.com](http://www.digitallumens.com).**



## Wearable vacuum cleans more than 7,000 square feet per hour

Offered in two models with 6- and 10-quart capacities, the Pac-Vac Aircomfort backpack vacuum cleaner has been re-engineered for operator comfort and ergonomics. The cleaner's specially made harness adjusts in five places to support the unit's 14-pound weight and is breathable, allowing air to escape on three sides to keep the wearer cool. Capable of cleaning more than 7,000 square feet per hour, the unit includes a four-level filtration system including HEPA filter cartridge, a complete set of tools and a double-bend wand. **Tornado Industries, 800-822-8867, [www.tornadovac.com](http://www.tornadovac.com).**



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## Remote service plan reduces stretch wrapping costs, equipment downtime

A new remote service plan is now offered on all of the supplier's new Octopus rotary ring stretch wrap machines—or as a retrofit to its existing automatic stretch wrappers. The service provides real-time equipment support from a technician who links to the equipment through a high-speed, secure Ethernet connection. Once logged in, technicians can



diagnose, correct or upgrade any part of the equipment as needed. This minimizes equipment downtime and reduces stretch wrapping costs. Other support functions include remote assistance with changing wrap patterns, human-machine interface program updates, and adjustments to programmable logic controller and variable frequency drive parameters. Muller, 800-628-6787, [www.mullerlcs.com](http://www.mullerlcs.com).

## Monitor fire sprinklers and control valves with devices

A line of devices monitor fire sprinkler systems and control valves to enable personnel to respond quickly to changes in fire sprinkler system status. Monitoring the flow of water to sprinkler heads, a selection of waterflow detectors can be mounted in vertical and horizontal positions and are compatible with steel pipe sized 2 to 8 inches. Supervisory

switches help prevent tampering or incorrect setting of valve controls, including outside screw valve monitoring and yoke, post indicator, butterfly or non-rising stem gate valve types. To indicate a discharge from a sprinkler, pressure switches are offered for connection to wet, dry, deluge and pre-action automatic sprinkler systems, as well as to dry pipe systems, pressure tanks, and automatic water control valve supplies. All three sensor styles may be specified in explosion-proof versions for hazardous environments. System Sensor, 630-377-6580, [www.systemsensor.com](http://www.systemsensor.com).



## Portable carpet extractor with tankless operation

The Nomad portable carpet extractor works without a built-in solution tank, allowing operators to use a sink or bucket as the unit's cleaning solution and water source. Dirty water can be released directly to a drain. Weighing 65 pounds, the unit is constructed of rotationally molded polyethylene for durability and is compact for easy storage. It includes large wheels and a front-mount carrying handle to maneuver up and down stairs, a 50-foot, no-tangle hose and a 12-inch wand

that allows the unit to remain in place during operation. Powr-Flite, 800-880-2913, [www.powr-flite.com](http://www.powr-flite.com).

## Lightweight, full body harness resists stains and water

An all-purpose full body harness line can help prevent falls during overhead maintenance activities. The Economy Harness line's webbing fibers have been treated with Scotchgard protector to repel liquids and prevent stains. Rated to 400 pounds, the line has expanded size offerings including XS, Universal and XXL. Easy-to adjust straps allow it to conform to a variety of body sizes, shapes and weights, while the lightweight construction ensures comfort, flexibility and ease-of-use for wearers. To reduce the potential for entanglement while at height, the harness features an X-shaped backplate and lanyard keepers. 3M, 888-364-3577, [www.3m.com](http://www.3m.com).



## Conserve water with restroom fixture

Ideal for high-traffic facilities, the ceramic Yukon model 2101 no-flush urinal complies with the Americans with Disabilities Act and covers most flushed urinal footprints. Because it operates completely without water, it conserves natural resources as well as inhibits bacteria growth to eliminate odors. The fixture is easy to maintain, LEED applicable, and has no external plumbing to tamper with, eliminating potential vandalism. Waterless Co., 800-244-6364, [www.waterless.com](http://www.waterless.com).



## Rider sweeper cleans indoor/outdoor

Engineered for indoor and outdoor use, the SW4000 rider sweeper features 49-inch cleaning path and runs up to 4.5 hours on a single battery charge. To maximize uptime and minimize broom wear, the machine incorporates a one-touch sweeping function that operates the main broom, side broom, vacuum fan and an optional misting system to minimize dust. Deploying the DustGuard misting function reduces dust by 75% for better indoor air quality and faster overall cleaning time. The vehicle has front-wheel drive and steering to easily maneuver in tight corners and narrow aisles; a hydraulic high dump and retractable hopper for safe handling and fast dumping; dust-free filters with a multi-frequency shaker; and retractable, spring-loaded side brooms and rugged steel guards that minimize the risk of machine damage due to impacts. Nilfisk, 800-850-5559, [www.advance-us.com](http://www.advance-us.com).



to outsource their daily, system-related IT tasks. Offerings include system administration, database administration and software patch management to improve operations (maximize uptime) and reduce expenses (minimize costs). Because the system's operating metrics are monitored continuously, issues that might contribute to downtime can be identified and corrected in advance. The service is staffed by trained engineering and technical support desk personnel who respond quickly if problems arise. Dematic, 877-725-7500, [www.dematic.com/service](http://www.dematic.com/service).

## Outsource automation system IT functions to improve operations, reduce expenses

The supplier's new Managed Services program proactively protects automated system installations by allowing facilities



to outsource their daily, system-related IT tasks. Offerings include system administration, database administration and software patch management to improve operations (maximize uptime) and reduce expenses (minimize costs). Because the system's operating metrics are

monitored continuously, issues that might contribute to downtime can be identified and corrected in advance. The service is staffed by trained engineering and technical support desk personnel who respond quickly if problems arise. Dematic, 877-725-7500, [www.dematic.com/service](http://www.dematic.com/service).

## Service calibrates load cells and terminals without test weights

The CalFREE calibration service combines equipment functionality, calibration methods and factory quality assurance without test weights. Offered for producing calibration certificates of the supplier's analog weigh modules and load cells, weighing terminals and other weighing instruments, the service is useful for tanks, vessels, hoppers or silos where it is impractical to place test weights on the scale. Mettler Toledo, 800-638-8537, [us.mt.com](http://us.mt.com).

## Service, support offerings keep operations running at peak efficiency

To maximize productivity and minimize unplanned downtime of automated fulfillment equipment, the supplier now offers a comprehensive customer service and support (CSS) team dedicated to providing extensive preventive, emergency and resident maintenance services. Additionally, a new Web site for spare parts procurement—[www.ontimeparts.com](http://www.ontimeparts.com)—connects users with an inventory of 75,000-plus original equipment

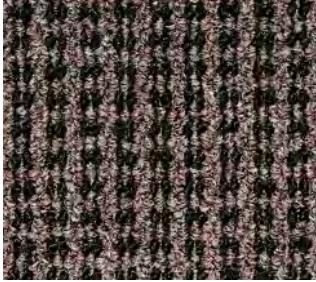


manufacturer and commodity parts. The site includes access to complete order histories, recommends parts by equipment lists, and shares in-depth views into part availability to streamline ordering. Intelligrated, 877-315-3400, [www.intelligrated.com](http://www.intelligrated.com).

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## Keep floors cleaner, safer with line of reinforced mats

Ideal for use in heavy-traffic areas, the Oxford Elite mat incorporates a needle-punch surface that traps dirt and soil while retaining moisture. The mat protects pedestrians and floor surfaces, keeping them clean-

er and safer. Features include a durable, reinforced latex-coated pattern, loop-pile polypropylene and nylon construction, and non-slip PVC backing. **Crown Matting, 800-628-5463, www.crown-mats.com.**

strips embedded into or on top of the floor at key facility entry points. The brush strips feature an angled roof that allows liquids and dirt to fall directly into a tray beneath the system that catches the debris. Capable of removing up to 90% of tire contaminants—including dirt, black tire dust, foreign matter and moisture—the system may also be configured for wet cleaning and disinfection. Other versions may be specified for use with pedestrians. **ProfilGate, 310-200-1156, www.profilgate.com.**



## Eliminate dirt from vehicle tires as they enter facility

A line of floor-based brushes work to prevent cross-contamination caused by dirt and contaminants tracked into a facility by forklift tires and other wheel-based transportation modes. The system includes irregular length blue bristles mounted on brush

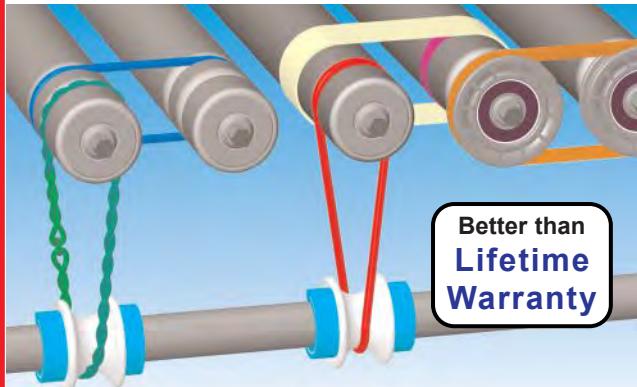
## Recycling extractor cleans carpets, partitions

The ECO 500 AW series of upright extractors for deep cleaning of carpets and partitions comes in 10- and 15-gallon models, making them ideal for use in small- to mid-sized spaces. Because the unit is a recycling extractor, it speeds up cleaning time by reducing the need to empty and refill the solution while extending water usage by more than seven times. Other features include: wheeled handle for easy load-



ing; hinged tank for easy access to internal components and filters; a front-mounted pressure gauge and adjustment knob to monitor cleaning performance; front-mounted drain hose for fast solution disposal; and sealed membrane switches on the rear-mounted control panel and power outlets. **CFR, 800-533-2557, www.cfrcorp.com.**

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**Dura-Belt** 800-770-2358 614-777-0295  
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## Nationwide service network provides scale calibration, maintenance

For ongoing scale maintenance and calibration, the supplier offers a nationwide service network of more than 250 certified and state-licensed technicians, factory-trained and equipped with the latest diagnostic and repair tools. Calibrations are performed using state-certified test weights. All testing processes include a thorough analysis of each scale section to ensure the accuracy of load points for even transfer of weight. Visual inspections include observation of scale condition, regulatory conformance, damages, safety, clearance, corrosion, grounding, use issues and electrical conditions. **Fairbanks Scales, 800-451-4107, www.fairbanks.com.**

## Transport work-in-process with bin cart system

For movement of work-in-process, a new line of double- and triple-bay bin transport carts come with dividable grid containers that slide in and out easily. To compartmentalize the containers, they can be equipped with a selection of multiple long and short dividers to meet various storage and handling applications. The carts are constructed of steel with a chrome finish; the plastic containers may be specified in blue, red, gray or clear. **Quantum Storage Systems, 800-685-4665, www.quantumstorage.com.**



## Square pallets for transport of flexible intermediate bulk containers

The Endur S7 and C7.2 reusable plastic pallets come in two square dimensions: 47 x 47 inches and 5 x 45 inches, respectively. Used to store and transport flexible intermediate bulk containers (FIBCs), or bags, in high-bay warehouses, the pallets handle load capacities up to 2,756 pounds on high racks. The C7.2 was developed for transport in ISO containers; the S7 allows space for six 23.6 x 15.75-inch modules per location, holding 20% more items than an industrial pallet or for transporting kegs. Features include a choice of three or six runners, and an open or closed upper deck that can optionally be equipped with anti-slip strips. **CABKA-IPS, 314-731-0302, www.cabka.com.**



## Electric articulating lift truck navigates narrow aisles

The B55AC and B55AC-HL narrow aisle lift trucks operate in aisles measuring 78 inches. Featuring 180-degree mast articulation, the four-wheel, AC-powered trucks ride on dual, independently driven rear-drive tires and soft-poly front load tires for reliable traction, braking and power to climb steep ramps while loaded. The vehicles may be equipped with three- or four-stage masts. A floating front axle allows the vehicles to traverse smoothly over uneven floors. When equipped with a freezer cab option, they can be used in cold storage areas to -22°F. **Bendi by Landoll, 800-428-5655, www.landoll.com.**



## Collapsible bulk container engineered to resist damage

To minimize damage in use, BulkStac 45 x 48-inch footprint reusable plastic bulk containers have been engineered with a variety of features that optimize strength. Recessed hinges on the collapsible walls connect with a concave inset for protection, while radii at the feet corners reduce the risk of fracture or splitting. A one-piece base prevents fork strap breakage, while a periphery runner improves stability without the need for a center foot. For more usable internal cube, the container has a flat deck, while its overall tare weight has been reduced for easier handling and lower transportation costs. The containers come in a variety of heights and may be equipped with optional access doors on all four sides for certain models. **SSI Schaefer Systems International, 704-944-4500, www.ssi-schaefer.us.**



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**Bill Bastian Sr.**

**Bastian Solutions**

**TITLE:** Founder and vice president

**LOCATION:** Carmel, Indiana

**EXPERIENCE:** 60 years in the materials handling industry

**PRIMARY FOCUS:** Field sales, new product design, company management and mentoring new hires

**Modern:** You're celebrating 60 years in the materials handling industry, which is quite a milestone. Tell us how you came into the industry.

**Bastian:** In 1955, I was 24 years old, I'd recently gotten out of the service and I joined the E.C. Stark Company, which was my father-in-law's business. Materials handling wasn't his primary business, but he did distribute Colson casters. I'd always wanted to have my own business, and in 1962, I was able to purchase the business from him. I renamed it the Bastian Stark Company.

**Modern:** What was the industry like back then?

**Bastian:** It was mostly fork trucks, pallets and push trucks, but things were changing. Being out in the field, I came in contact with some of the large companies in and around Indianapolis, and I could see the way they were thinking about automation. Even before I bought the company, I realized we had to add other materials handling products and services. In about 1959, I had an opportunity to quote a fairly large conveyor job for a Chrysler plant. We didn't have a line of conveyors, or an engineer, but I found someone who would quote the job for me. While I'm not an engineer, I was good at math and had experience building houses. I understood the application, and as luck would have it, I got the job. About that time, Hytrol was getting started and we became one of their early distributors.



We were fortunate to get started just as a revolution was taking place in the conveyor industry, and we really trained ourselves to become conveyor experts.

**Modern:** You began as a distributor, yet, over the years, you have become a systems integrator and manufacturer. How did that evolution take place?

**Bastian:** As the business moved along, customers would ask us to do things that weren't in the catalog. So, we began to design special handling equipment, and worked with fabricators in the area to build them. Eventually, we were selling quite a bit of these types of orders and realized we were getting pretty good at it, so we began manufacturing ourselves. Systems integration grew out of the conveyor business, which was a system. My son, Bill, joined the company in the 1980s. He's a terrific engineer and was really excited by the automation

revolution. A lot of things were coming together that were making automation possible, like the computer industry and the servo motor, and Bill really moved us in that direction. Even after 60 years, I see new things coming every day that blow my mind.

**Modern:** What are customers looking for today that's different?

**Bastian:** Customers have the same problems as they always have. What's different is that the industry has come up with things that have delivered real improvements. Automation is moving things faster, taking up less space and doing it with less labor. You have exciting new automated storage technologies, and robotics is just amazing. In the coming years, I think automation and robotics is going to continue to advance to get a product through all those phases from manufacturing to its final destination.

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Monday, November 2	
10:00 AM	Welcome
10:30 AM	<b>OPENING KEYNOTE:</b> Economic Forecast for the Supply Chain <b>Brian Beaulieu</b> , ITR Economics
11:30 AM	Networking Lunch Sponsored by: 
1:00 PM	What Will It Take for Purchasing to Get a 'Seat at the Table'? <b>Rob Handfield</b> , Supply Chain Resource Cooperative, Poole College of Management, NC State University
2:00 PM	Reshoring and Rebalancing Global Supply Chains <b>Rosemary Coates</b> , Reshoring Institute
3:00 PM	Break
3:30 PM	Supply Chain Innovation <b>Scott Sopher</b> , Deloitte Consulting LLP
4:30 PM	Transportation Logistics: Freight Outlook <b>Kevin Zweier</b> , Chainalytics
5:30 PM	Research presented by SCMR and Platinum Sponsor: 
6:00 PM	Networking Reception

Tuesday, November 3	
8:30 AM	Supply Chain 2020: When Uncertainty is a Certain Factor <b>Lawrence Lapide</b> , MIT Center for Transportation and Logistics (CTL)
9:30 AM	Supply Chain Priorities Roundtable <b>John Caltagirone</b> , Loyola University Chicago
10:30 AM	Break
11:00 AM	Supply Chain Sustainability: Future Challenges and Opportunities <b>John Bell</b> , University of Tennessee
12:00 PM	Lunch: Supply Chain Reader Research Presentation <b>Bob Trebilcock</b> , Supply Chain Management Review Sponsored by: 
1:00 PM	<b>CLOSING KEYNOTE:</b> Culture is the Future of Supply Chain <b>Steven Melnyk</b> , Michigan State University

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