



MODERN

mmh.com

MATERIALS HANDLING®

October 2015

SPECIAL REPORT

Top 20 ADC suppliers **24**

INFORMATION MANAGEMENT

Is RFID ready for a reinvention? **28**

EQUIPMENT REPORT

Flexibility meets automated goods-to-person stations **34**

BEST PRACTICES

A closer look at slotting **40**

Grob: Getting the goods to the person **16**

Christian Lisiecki,
director of strategic
projects for Grob

SPEEDY
ACCURATE
COST EFFECTIVE
PACKAGES TO YOUR CUSTOMER

DEMATIC

We **Optimize** Your Supply Chain.

DEMATIC.COM

Omron to acquire U.S.-based Adept Technology

OMRON Corp., a supplier of sensing and control technology, has entered an agreement to acquire Adept Technology, a provider of intelligent robots, autonomous mobile robot solutions and services.

OMRON plans to acquire 100% of the outstanding shares of Adept common stock at a value of approximately \$200 million. Founded in 1983, Adept recorded annual sales of \$54.2 million and gross margin of 42% in the fiscal year that ended on June 30, 2015.

"We are delighted Adept Technology, a world leader in robotics, has agreed to join OMRON,"

said Yutaka Miyana, OMRON Industrial Automation Business company president. "This acquisition is part of our strategy to enhance our automation technology and position us for long-term growth. Robotics will elevate our offering of advanced automation."

Rob Cain, president and CEO of Adept, will continue to lead Adept and will report to Nigel Blakeway, chairman, CEO and president of Omron Management Center of America, OMRON's wholly owned U.S. subsidiary.



Hoist Liftruck enters into private label agreement with TMHU

HOIST LIFTRUCK MFG., a manufacturer of high-capacity materials handling equipment, has entered into an exclusive agreement with Toyota Material Handling USA (TMHU) to manufacture pneumatic tire forklifts under a private label agreement.

Hoist Liftruck will manufacture pneumatic tire products with capacities ranging from 22,000 to 72,000 pounds to TMHU's specifications. Its first orders are expected to be delivered later this year.

"The high-capacity forklift market is an important segment of the materials handling industry in North America," said TMHU president Jeff Rufener. "We are committed to our role as a full line supplier and we are proud to partner with Hoist to offer Toyota

dealers and customers a broader selection of high capacity forklifts made in the United States"

Hoist Liftruck recently announced its pending manufacturing expansion into a 550,000-square-foot building in East Chicago, Ind.



HighJump acquires Wesupply

HIGHJUMP SOFTWARE, a global provider of supply chain management solutions, has acquired Wesupply, a UK-based provider of supplier enablement and B2B integration solutions.

The company offers a fully managed service platform and best-of-breed application for B2B message tracking, order fulfillment and invoice processing across multiple industries.

The acquisition is intended to address the market for trading partner connectivity and omni-channel enablement. Wesupply's comprehensive electronic trading platform increases HighJump TrueCommerce EDI Solutions' global reach to more than 10,000 trading partners and 130,000 trading connections. A multi-tenant SaaS solution enables quick onboarding of new trading partners and rapid time-to-value for community members.

"With the dynamics of today's supply chain, retailers around the world are embracing omni-channel enablement as a top priority to remain profitable while meeting customers' expectations across channels," said Michael Cornell, CEO of HighJump.



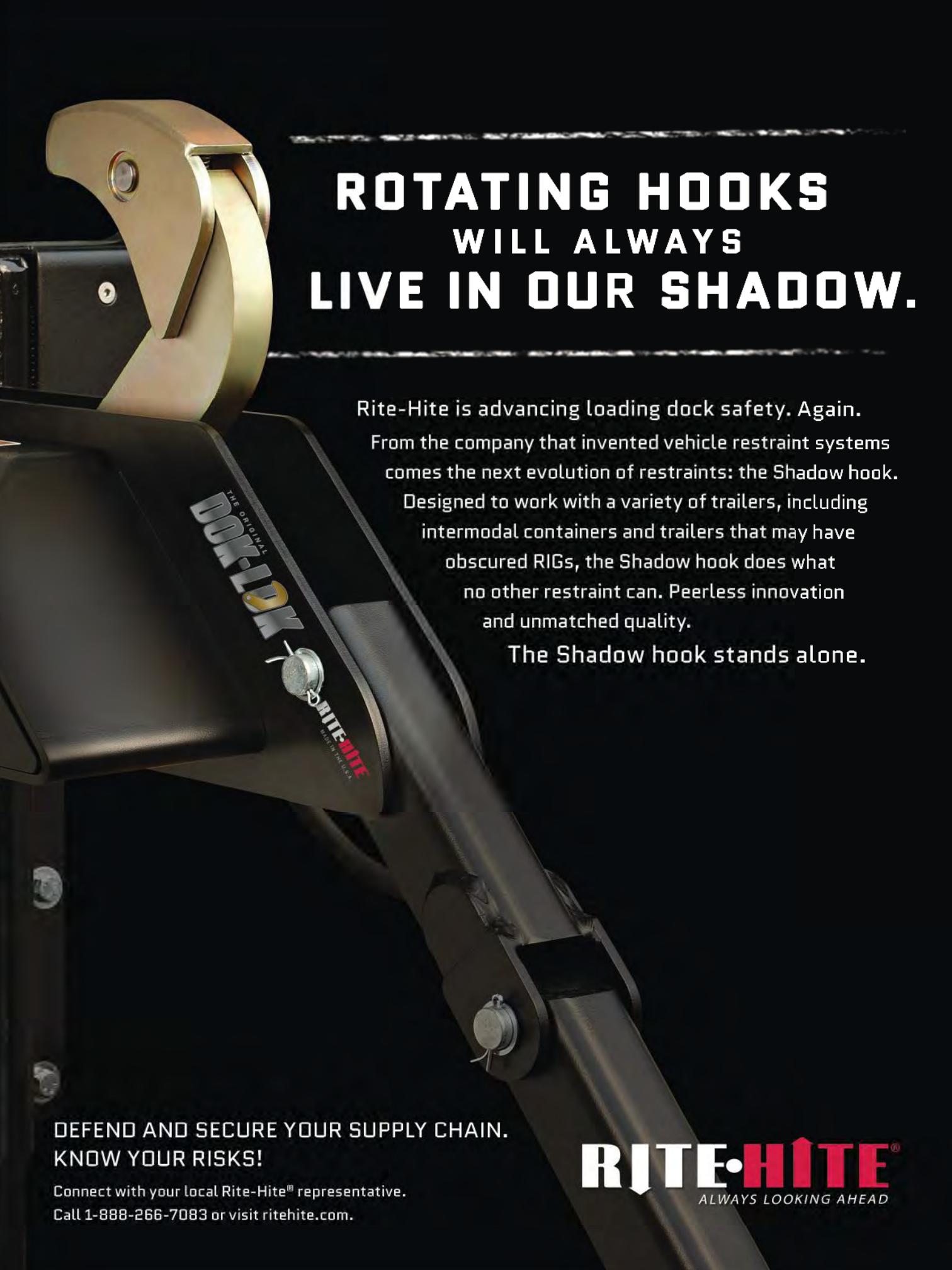
Accenture acquires Total Logistics

ACCENTURE HAS ACQUIRED Total Logistics, an independent logistics and supply chain consultancy based in Wokingham, UK.

The acquisition is intended to strengthen Accenture's supply chain capabilities across multiple industries—particularly retail and consumer goods—for companies looking to provide their customers with interactive shopping experiences on any device at any time.

"Consumers' expectations to shop using any channel they choose and still get fast and reliable delivery poses logistical and financial challenges for retailers," said Lucy Larkin, managing director in Accenture's retail practice in the UK. "In this environment, it becomes critical for retailers to transform their supply chain models to enable a more real-time, digitally enabled service."





ROTATING HOOKS WILL ALWAYS LIVE IN OUR SHADOW.

Rite-Hite is advancing loading dock safety. Again. From the company that invented vehicle restraint systems comes the next evolution of restraints: the Shadow hook. Designed to work with a variety of trailers, including intermodal containers and trailers that may have obscured RIGs, the Shadow hook does what no other restraint can. Peerless innovation and unmatched quality.

The Shadow hook stands alone.

DEFEND AND SECURE YOUR SUPPLY CHAIN.
KNOW YOUR RISKS!

Connect with your local Rite-Hite® representative.
Call 1-888-266-7083 or visit ritehite.com.

RITE·HITE[®]
ALWAYS LOOKING AHEAD



MODERN MATERIALS HANDLING®

PRODUCTIVITY SOLUTIONS FOR DISTRIBUTION, WAREHOUSING AND MANUFACTURING

Christian Lisiecki,
director of strategic
projects for Grob

Falk Heller/Getty Images



60 seconds with
Douglas Thomas,
Penn State

COVER STORY

SYSTEM REPORT

16 Grob: Getting the goods to the person

In its new logistics center, German machine manufacturer Grob installed automated storage technologies and goods-to-person picking to speed materials to the assembly line.

22 How the system works: From the warehouse to the assembly line

FEATURES

SPECIAL REPORT

24 Top 20 automatic data capture suppliers

Deadlines, data and finding solutions for each are pushing the end-user and supplier communities to adapt.

INFORMATION MANAGEMENT

28 Is RFID ready for a reinvention?

RFID can automatically capture item-level inventory data without extra handling, leading to improved visibility for many types of goods. Here's a look at how companies are aiming to make the most of that visibility.

EQUIPMENT REPORT

34 Flexibility the hallmark of today's automated goods-to-person installations

Variety of equipment and installation options lets operations customize their handling to match inventory profiles, customer demands.

BEST PRACTICES

40 Slot leadership

Whether distributors are new to warehouse management software or as sophisticated as they come, many are sitting on opportunities to improve slotting, spending and service levels.

DEPARTMENTS & COLUMNS

3/ Upfront

7/ This month in *Modern*

12/ Lift Truck Tips: Operator training

14/ Packaging Corner: Labeling

46/ Productivity Solutions

50/ Supplement: Warehousing/Distribution

58/ Focus On: Overhead handling

61/ Product Showcase

66/ 60 seconds with...

NEWS

9/ Conveyor manufacturers anticipate continued growth

10/ Freedonia study: Developing countries to drive growth in packaging machinery

11/ North American machine vision market sets new record in first half of 2015

Modern Materials Handling® (ISSN 0026-8038) is published monthly by Peerless Media, LLC, a Division of EH Publishing, Inc., 111 Speen St, Suite 200, Framingham, MA 01701. Annual subscription rates for non-qualified subscribers: USA \$119, Canada \$159, Other International \$249. Single copies are available for \$20.00. Send all subscription inquiries to Modern Materials Handling, 111 Speen Street, Suite 200, Framingham, MA 01701 USA. Periodicals postage paid at Framingham, MA and additional mailing offices. **POSTMASTER: Send address changes to: Modern Materials Handling, PO Box 1496 Framingham MA 01701-1496.**

Reproduction of this magazine in whole or part without written permission of the publisher is prohibited. All rights reserved. ©2015 Peerless Media, LLC.

Peerless
MEDIA, LLC

**CAPABILITY +
SPATIALITY = ?
HYUNDAI
ALWAYS HAS
ANSWERS FOR YOU**

**SHIFT
YOUR PERFORMANCE**

25B-9

Innovation of forklifts! Uniquely outstanding performance meets design!
The most powerful of its class, with gradeability driven by the dual drive system!
Stunning work performance in tight spaces with its minimized rotation!
We accompany you today as always with our cost cuts with high-quality performance.
The answer to the selection you will never regret is Hyundai Heavy Industries' 25B-9.

MOVING YOU FURTHER



EDITORIAL OFFICES

111 Speen Street, Suite 200
Framingham, MA 01701-2000
(800) 375-8015

Michael Levans

GROUP EDITORIAL DIRECTOR
mlevans@peerlessmedia.com

Bob Trebilcock

EXECUTIVE EDITOR
btrebilcock@peerlessmedia.com

Noël P. Bodenburg

EXECUTIVE MANAGING EDITOR
npbodenburg@peerlessmedia.com

Josh Bond

SENIOR EDITOR
jbond@peerlessmedia.com

Sara Pearson Specter

EDITOR AT LARGE
sara@saraspecter.com

Roberto Michel

EDITOR AT LARGE
robertomichel@centurylink.net

Jeff Berman

GROUP NEWS EDITOR
jberman@peerlessmedia.com

Wendy DelCampo

ART DIRECTOR
wdelcampo@peerlessmedia.com

Daniel Guidera

ILLUSTRATION
daniel@danielguidera.com

Brian Ceraolo

PRESIDENT AND GROUP PUBLISHER
bceraolo@peerlessmedia.com

PEERLESS MEDIA, LLC

www.peerlessmedia.com

Kenneth Moyes

PRESIDENT AND CEO
EH PUBLISHING, INC.

MAGAZINE SUBSCRIPTIONS

Start, renew or update your FREE magazine subscription at

www.mmh.com/subscribe.

Contact customer service at:

Web: www.mmh.com/subscribe

Email: mmhsubs@ehpub.com

Phone: 1-800-598-6067

Mail: Peerless Media

P.O. Box 1496

Framingham, MA 01701

For reprints and licensing please contact Nick Iademarco at Wright's Media, 877-652-5295, ext. 102 or niademarco@wrightsmedia.com.

NEWSLETTER SUBSCRIPTIONS

Sign up or manage your FREE

eNewsletter subscriptions at

www.mmh.com/enewsletters.

MICHAEL LEVANS
GROUP EDITORIAL
DIRECTOR



Grob snaps together the pieces of innovation

We're living in a wonderful period of "realization," where managers are taking the time to examine exactly what they need in certain areas of an operation instead of throwing the kitchen sink at a problem and spending millions in the process.

When we become aware that no single technology or process can do it all, the idea of piecing together a more customized solution—where technology and process match our exact needs—becomes more approachable from both an implementation and cost stand point.

Today, the goal is not to find the "one" right way, but to find the "many" right ways to solve an issue. And with this mindset, we're not only getting smarter, we're getting bolder in terms of the technology and process we use and the path we take to get there. Enter Grob-Werke GmbH & Co., the Mindelheim, Germany-based machine manufacturer that's the subject of this month's System Report (page 16).

Grob has gone through what it defines as a "logistics paradigm shift" after it realized it had to throw out its manual systems to keep up with explosive growth.

In fact, the company put a combination of a high-density automated storage system together with goods-to-person picking technology—a duo found in any savvy e-commerce facility—to streamline the way it picks and kits materials in its new logistics center to replenish assembly stations in its adjacent manufacturing plant.

"What I found most intriguing in Grob's story is that the goods-to-person revolution is moving from distribution into fulfillment operations in manufacturing," says executive editor Bob Trebilcock, author of this month's System Report. "And, in a way, that might be a matter of things coming full circle."

After all, the whole idea of a manufacturing assembly line is to keep associates in one place with the line bringing the work to them. "Don't forget, distribution adapted that idea into its fulfillment processes and now manufacturing is taking a cue and bringing it back home where it began."

Today, Grob's order selectors pick between 5,000 and 6,000 parts each day from the new system, numbers they were never able to touch in the past. And even with those high pick rates, the company claims that they have fewer missing parts in orders and delivery is on time and in the right place.

"Grob has essentially pieced together a strategic puzzle of technology and process to meet a specific need," adds Trebilcock. "It includes automated storage, goods-to-person, advanced vision systems, the integration of its warehouse management system into SAP, as well as a crossdocking process to streamline newly received materials—all pieces that have been snapped together into a cohesive whole."

Some may call it "unconventional," but we believe it's just pure innovation at work.

*Call it an MRO reality check.
Or best-practice confirmer.
Or issue identifier.*

Evaluate Best Practices.

An **SDI MRO Supply Chain Evaluation** is a comprehensive multi-day assessment of your current MRO process to determine all that you're doing right – and where you could be doing more to **create greater efficiencies, improve overall equipment effectiveness, and identify true total cost of ownership.**

Look into an SDI MRO Supply Chain Evaluation. The only cost is a commitment of time, on both our parts. We urge you to explore this complimentary – and potentially revolutionary – opportunity. **Today.**



Let's get started. Schedule a pre-evaluation consultation now.

SDI

The supply chain
works best when
it all works together

sdistart.com
start@sdistart.com

NEWS & TRENDS

Follow
Modern Online



facebook.com/mmhmagazine

Twitter | @modernmhmag

Web | mmh.com



AUTOMATION

Conveyor manufacturers anticipate continued growth

CEMA'S FIRST HALF RESULTS AND ESTIMATES FOR THE REMAINDER OF 2015 REFLECT DOUBLE-DIGIT GROWTH FOR UNIT HANDLING EQUIPMENT.

BY JOSH BOND, SENIOR EDITOR

MEMBERS OF THE Conveyor Equipment Manufacturers Association (CEMA) celebrated a strong first half as sales continue to hover around record levels.

CEMA tracks new orders and shipped sales volume in nine classes of unit handling equipment and four classes of bulk handling equipment. Executives representing CEMA member companies recently attended the association's Fall Meeting in Chicago where they expressed continued optimism after reporting that overall industry orders (bookings) for the first six months of 2015 increased 5.78% compared to the same period in 2014, with total orders of \$5.72 billion. Industry billed sales (shipments) were up 7.87% to \$5.87 billion.

Bob Reinfried, executive vice president of CEMA, said growth is expected to continue through 2015, by

which time CEMA expects 2015 shipments will have increased by 7% from last year—a year that saw 9% gains. This forecast remains unchanged from the March 2015 forecast.

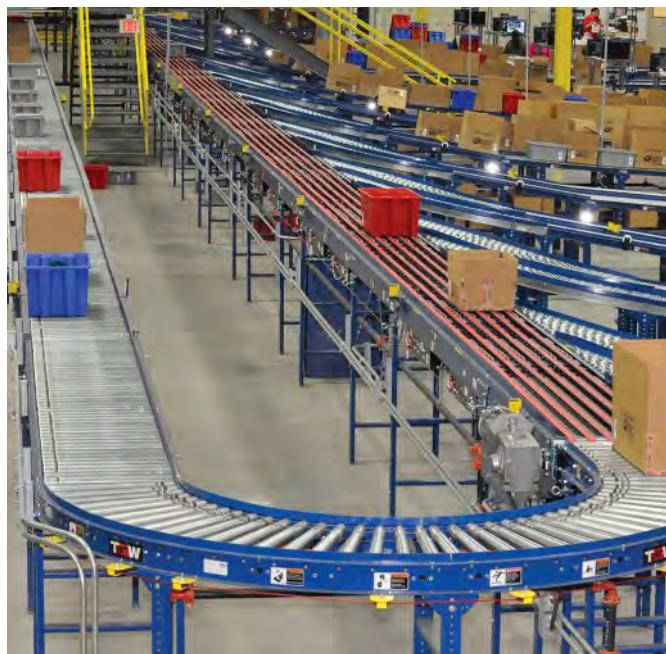
“Early this year, we thought it would be a very good year for the conveyor industry, and we’re sticking

with that,” said Reinfried, who added that unit handling continues to grow by double digits, with orders up 12.33% and shipments up 11.39%. “Everything is looking bright.”

That said, the market for bulk handling equipment has softened following a sharp decline in oil prices. Some economists had suggested the price per barrel could fall to \$20, which Reinfried said would be very bad news for bulk conveying. It is

now more likely the price will land around \$50 to \$60 per barrel this year, which could increase jobs and equipment usage in the bulk market. For the first half, bulk orders were down 5.51% and shipments were up 1.55%, so CEMA predicts a modest rebound.

“Most members are optimistic, lead times are going out, and they’re still hiring, but we realize a lot can happen with interest rates and little spooks here and there like China devaluing its currency,” Reinfried said. “Still, I don’t think we’ll see any dip in 2016, just maybe a slower rate of growth.”



PACKAGING

Freedonia study: Developing countries to drive packaging machinery growth

GLOBAL PACKAGING MACHINERY demand is projected to grow 6.5% per annum through 2019 to almost \$52.5 billion, according to a recent study by Freedonia Group. The study also suggests product sales will be driven by market growth in China and other industrializing nations, where demand for processed food and beverage products and other manufactured goods is expected to post the strongest increases as personal incomes and consumer spending rise.

In a recent interview with Freedonia analyst Gleb Mytko, he said in the last decade, a number of industrializing nations have adopted regulations that target packaging machinery and materials, including China and India.

"As the regulatory framework in

developing parts of the world develops, it will have a significant effect on packaging equipment use," said Mytko. "Additionally, some manufacturers in industrializing countries are adhering to regulations from developed markets—dealing with everything from operator safety to energy efficiency—to be able to sell their packaging machinery abroad."

China alone is expected to account for one-fourth of all new product demand gains through 2019. Smaller firms in developing countries are expected to transition from manual packaging processes to mechanized packaging between 2014 and 2019 to expand output and increase efficiency, further boosting packaging machinery demand.



The large, mature North American and West European packaging machinery markets are forecast to expand at a subpar annual rate during the 2014-2019 period. Product sales in the United States and Germany, the two largest markets in these regions, are expected to moderate after advancing roughly 9% per annum between 2009 and 2014.

The food and beverage markets are forecast to account for 55% of all new product demand generated



M
A Myers Industries Company

©2015 Buckhorn / Myers Industries, Inc. #081915

YOU PERFECT IT. WE'LL PROTECT IT.

Buckhorn offers an unmatched selection of reusable packaging solutions designed to protect your products and increase your profitability.



NEW! Distribution Pallet

Our new 48" x 40" nestable distribution pallet optimizes storage, shipping and handling for the grocery, retail and wholesale food distribution markets. It features a high dynamic load capacity of 3,000 lbs., and it offers a superior nest ratio. 1,260 empty pallets fit in a 53' trailer. Its non-slip surface minimizes product movement, and the ergonomic top deck hand holds make lifting easier than ever.

Visit buckhorninc.com for more information, and request a quote today!

 **BUCKHORN**

US: 1.800.543.4454
Canada: 1.800.461.7579
www.buckhorninc.com

BULK BOXES | HAND-HELD CONTAINERS | IBCs | PALLETS | SPECIALTY BOXES

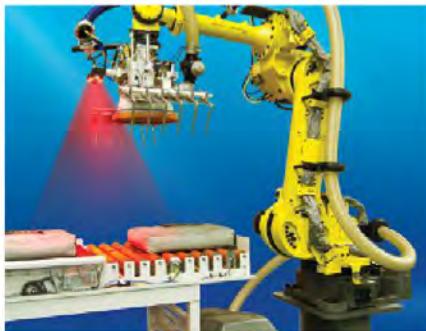
between 2014 and 2019. Demand for labeling and coding machines, as well as filling and form/fill/seal equipment, is forecast to grow more than 7% per annum during the 2014-2019 period.

DATA CAPTURE

NA machine vision market sets new record in first half of the year

NORTH AMERICAN SALES of machine vision systems and components grew 16% to \$1.2 billion in the first half of 2015, the market's highest first half total in history, according to new statistics issued by AIA, the industry's trade group.

Total machine vision sales include sales of machine vision systems and components. The machine vision systems category saw a year-over-



year increase of 18% to \$1 billion in the first half of 2015. Machine vision systems include smart cameras and application specific machine vision (ASMV) systems. Smart cameras expanded by 13% to \$151.3 million, while ASMV systems increased 19% to \$892.3 million in the first half of the year.

Similarly, machine vision components had a strong half with 6% growth to \$164.7 million. The leading product categories within ma-

chine vision components in terms of growth were lighting (20%), software (8%) and imaging boards (8%).

"Industry experts are optimistic for growth in machine vision cameras, software and imaging boards in the next six months," said Alex Shikany, AIA's director of market analysis. "However, experts expect machine vision systems to remain flat in the next two quarters."

Despite the record first half performance, the market experienced a slight slowdown during the second quarter of 2015. Over the last four consecutive quarters, the average growth for the machine vision market in North America has been 18%, which is notably higher than the market's second quarter growth of 10%.

"Machine vision, like many other manufacturing markets, is cyclical in nature," Shikany added. □

Lind Isolated Power Adapters

Lind Isolated Power Adapters provide regulated DC voltage to power RFID readers, barcode scanners, laptops, tablets and any mobile device you need to keep your business moving, stacking, tracking, picking and selling!

LIND

Mobile Power Specialists

www.lindelectronics.com/warehousing

Take training to the next level

Best practices account for the behavior of the operator and the equipment.

By **Josh Bond**, Senior Editor

Ideally, lift truck operator training practices in the average facility are better than they were five years ago. Technologies like simple impact sensors have improved accountability, and simulators can help educate operators about complex narrow aisle equipment. But optimal training is not just about delivering the same old information in more frequent and user-friendly ways. Technologies on and around lift trucks are broadening the scope of what operators should know about the equipment and their role in wider business processes.

"Safety is always the central focus, but the training component of safety is changing," says John Rosenberger, manager of iWarehouse Gateway and global telematics for The Raymond Corp. "That is because lift truck safety technology is becoming more sophisticated."

For instance, impacts above a certain threshold might automatically slow a piece of equipment to 1 mph to allow the operator to drop the load and move to a safe place. Or, proximity sensors could trigger a handle vibration, create an audible warning or decelerate a truck to prevent an impact.

"You have to incorporate the lift truck's response into operator training so there are no surprises," Rosenberger says. "If you're in the middle of a tight corner and you see lights, feel the handle shake, hear beeps or what have you, what is the proper response?"

In addition to integrated sensors, Rosenberger predicts increased use of wearable cameras, fork-mounted cameras and rear-mounted cameras to give operators and managers more visibility.

"These will be great for safety, records and accountability, but it's also good for everyday usage and productivity," he says. "If an operator can see from the fork's perspective on the way up, he will line them up quicker. And, if he can more readily see around a corner or behind the lift truck, that's good for safety and efficiency."

Of course, each camera also requires a training element and not just for the operator. Supervisors will need to consistently support the proper use of the technology and



emphasize the benefits to the operator and the operation.

"If after a while I find that nobody is actually watching the cameras, I might go right back to old behaviors," Rosenberger says. "It's the same for telematics systems. Operators are supposed to log on and off, enter task codes, and it seems like busy work. What's in it for them?"

The first part of the answer is a safer environment, but perhaps more compelling is that the more margin a company can make in a warehouse, the more it can help employees. "An operator might skip the task codes and leave some steps outside that process since he has experience and thinks that's fine," Rosenberger says. "But the data is what's helping confirm the company is more efficient—and then pay, benefits and incentive programs will reflect it."

Telematics systems can also help identify the root cause of problems so operators don't take the blame for something out of their control. One customer recently increased lift truck speed by 1 mph, which had an unexpectedly large impact.

"Operators started finishing a hour early, and it looked like they were slacking, but the problem was with the task queue," he says. "Everyone has gut feelings, but now you can use data to support them."

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



Warehouse Automation and Warehouse Execution Software.
Perfectly paired for greater precision.

No matter the challenges facing your distribution operations, FORTE can assemble the perfect combination of warehouse automation and warehouse execution software (WES) to conquer them. Now backed by Swisslog, FORTE plans, designs and implements intralogistics solutions that enable forward-thinking companies to provide the right product to the right place at the right time. Together we work with our customers to optimize their operations and help them manage growth.

Let the warehouse automation experts at FORTE help you achieve more. FORTE-Industries.com

Streamline packing slip insertion and label application

Automating the print-and-apply process of combination shipping labels and packing slips can boost throughput and reduce costs.

By Sara Pearson Specter, Editor at Large

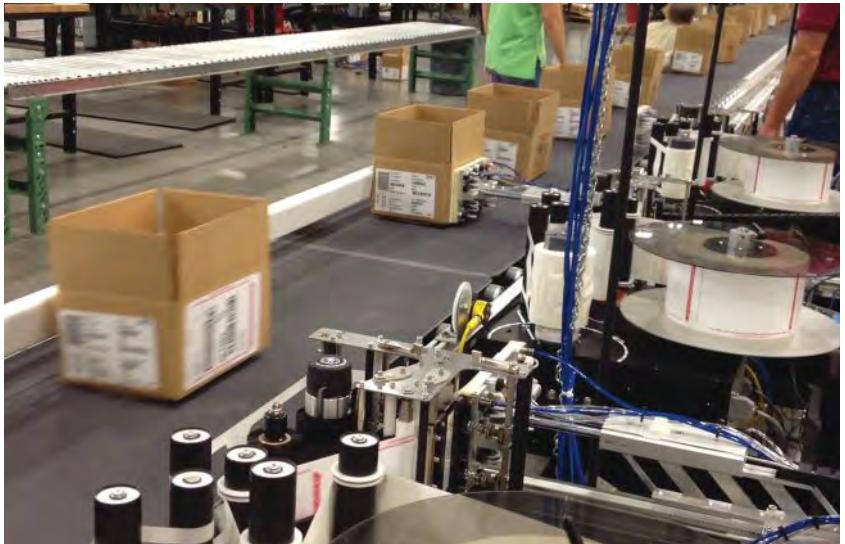
With the exponential growth of e-commerce—and the corresponding explosion of one- and two-line item shipments—retailers and third-party logistics providers are looking to automate and streamline packing slip insertion and label application for a significant throughput boost, says Rick Fox, president and CEO of FOX IV Technologies.

“For 95% of operations, adding labels and packing slips is a manual process,” he explains. “They’re either placing the 8.5 x 11-inch packing slip into the box or are folding it into quarters and inserting it into a plastic, adhesive-backed sleeve affixed by hand to the carton.”

Transitioning to automated label printer applicators converts a process that might take a worker 30 seconds per package to rates as high as 17 packages per minute. That’s because the worker has to verify that the items in the package match the packing list and the shipping label before manually adding each.

Conversely, print-and-apply machines imprint and affix shipping labels to cartons or pouches using a pneumatic or electric cylinder to actuate a pad that presses it onto the package. While automation can be added to simultaneously print and drop a full-size packing slip into an open carton, many operations are moving to equipment that combines the label and packing slip into a single unit.

FOX IV’s TwinPrint system uses two print heads to mark the shipping information and a confidential packing slip on one label. The liner is die cut so a portion remains when the outer perimeter is peeled off for application. Tamper-evident, the packing slip is accessible with a perforated zipper strip.



“Companies ask about redesigning their packing slip from an 8.5 x 11-inch sheet to a 4 x 6-inch standard label space,” Fox says. “The TwinPrint can print up to 30 items on the liner, but with most e-commerce orders only being one or two items, it’s ultimately not an issue.”

It’s also more convenient for recipients and internal operations, saving time and cost while boosting sustainability, he adds. “By repurposing the liner, we cut the label waste by as much as 70%, plus eliminate plastic packing slip pouches and the 8.5 x 11-inch paper.”

Software ensures that the shipping address matches the order information, he adds. “The system is designed to not print the label and pack slip until both print heads have the data.”

Sara Pearson Specter is an editor at large with Modern and can be reached at sara@saraspecter.com.

DIMENSIONAL CHARGES ARE NOW REALITY.

**But making the most of them doesn't
have to be a tight squeeze.**

Beginning this year, major shipping companies have begun to base shipping costs on **weight and dimension**. That means that empty space costs you more money. With Packsize® On Demand Packaging®, you get a perfectly sized box, for every product, every time.

The world's largest companies are
switching to On Demand Packaging®

packsize.com



Grob:

Getting the goods to the person

In its new logistics center, German machine manufacturer Grob installed automated storage technologies and goods-to-person picking to speed materials to the assembly line.

By Bob Trebilcock, Executive Editor

The combination of high-density automated storage systems with goods-to-person picking has brought new efficiencies to distribution, especially e-commerce fulfillment. Quite simply, order selectors who can stand in one place to pick can fill more orders than those who have to walk through a facility to do their work.

In Mindelheim, Germany, Grob-Werke GmbH & Co. KG, a family-owned manufacturer of machines and assembly systems for manufacturing operations, turned to that same combination to streamline the way it picks and kits materials in a new logistics center to replenish assembly stations in its adjacent manufacturing plant. After all, if you think about it, picking pieces for the line is not unlike picking pieces for a single- or multi-line order for a consumer—they



Christian Lisiecki, director of strategic projects



Falk Heller/Getty Images

both involve handling a lot of individual parts.

The result has been “a logistics paradigm shift,” according to Christian Lisiecki, the director of strategic projects who worked with a systems integrator (viastore systems, viastore.com) to transform what had been a conventional manual pick area into a highly automated solution designed to keep up with the company’s impressive growth.

“We could not manage the amount of picking we are doing every day if we were still trying to do this manually,” Lisiecki says, adding that order selectors pick between 5,000 and 6,000 parts each day from the automated systems. “We were at the limit of our facility, even if we put more people in the warehouse.”

The logistics center occupies about 93,000 square feet in a facility that tops out at 1.2 million square feet in Grob’s largest manufacturing location. The new order fulfillment area includes:

- **Pallet-handling automated storage and retrieval system (AS/RS):** The eight-aisle AS/RS has nearly 9,000 storage locations in single-deep storage, with a maximum load capacity of 1 ton per pallet. At full speed, the AS/RS can perform 280 storage and retrieval moves per hour. It feeds six goods-to-person pick stations.

- **Mini-load AS/RS:** The four-aisle, mini-load has 26,288 storage locations, with two- and four-layer deep storage. The system can move 580 containers per hour. Like the pallet-handling AS/RS, the mini-load system services six goods-to-person pick stations and is connected to a manual warehouse through a platform with a pick-up and drop-off location. The load handling devices can handle two containers with a footprint of 600 x 400 millimeters; four containers measuring 300 x 400 millimeters; one container sized 600 x 400 millimeters; or two containers



In its new logistics center, Grob installed mini-load (left) and unit-load (right) AS/RS systems to deliver goods to associates doing the picking.



measuring 300 x 400 millimeters.

- **Manual storage:** A manual reserve storage area is designated for non-conveyables such as large, heavy or over-sized parts that can’t be handled by either AS/RS. In this area, order selectors pick to pallets on a lift truck.

- **Vision technology:** Grob implemented a camera-based imaging system that not only captures information about each pick that can be reviewed later should an error occur, it also records the degree of filling for each load carrier. That information is used by the system to calculate when a container, pallet or storage location needs to be replenished.

- **Cart system:** Orders are filled and staged on carts that are then delivered to the assembly areas in the plant. A specialist in the assembly area delivers the carts to the right work area.

- **Warehouse management system (WMS) and enterprise resource planning system (ERP):** Grob inte-

grated a new WMS with SAP to manage storage locations and synchronize activities in the logistics center.

Since going live at the end of 2013, “the pick quality is excellent and the throughput rate is significantly higher than before,” Lisiecki says.

Dealing with inefficiency

Family-owned Grob Group has been serving industry since its 1926 founding in Munich to produce a stationary heat engine. The company charted a new course in 1952, under the direction of Burkhart Grob, the son of the company founder, developing production machines for the automotive industry.

Today, Grob is headquartered in Mindelheim, home to the largest of its four manufacturing plants; other plants are located in Sao Paulo, Brazil; Bluffton, Ohio; and Dalian, China. The company employs an estimated 5,000 employees worldwide and generates



THE FUTURE OF FLEET IS HERE

Verizon Networkfleet's patented telematics solution delivers the data you need to improve your fleet's performance. Route vehicles more efficiently. Control fuel costs. Streamline vehicle maintenance. When your goals include lowering costs and improving fleet performance, Verizon Networkfleet has the products and tools you need to help you reach your goals - starting at \$1 per day, per vehicle.

866.869.1353 | networkfleet.com/SCMgps

annual revenue of more than 1 billion euros. Its product portfolio ranges from universal machining centers to complex, fully automated assembly lines.

In recent years, Grob has experienced a significant uptick in business as automakers have invested in new factories and automation. In Mindelheim, Grob expanded production capacity by more than 35% and added 700 new employees to keep pace with demand. Despite this expansion, the existing manual warehouse that supplied materials to the assembly line was running out of space and throughput capacity to keep pace with production.

“Our old system was person-to-the-materials,” says Lisiecki. “Our order selectors walked through the different rack areas and picked materials to a cart.” Productivity was low and picking was sometimes chaotic. “During the day, we had dedicated warehouse workers who retrieved materials and posted the picks to the order,” he adds. “But, during the night shift, assembly workers would go through the warehouse to get their own materials, which were often not posted correctly.”

Moreover, it was a complex operating environment. The logistics center manages an inventory of about 50,000 SKUs at any given time. However, due to the complexity of the machines manufactured by Grob, there are as many as 1.9 million material master records, and the company adds about 500 new part numbers each day. Many of those SKUs will only be used for one job, and then not used again. To create more space, Grob began storing some material outside the logistics center, which meant coordinating the delivery of those materials to the logistics center with parts and materials stored on site.

Other work areas were also challenged. Receiving, for instance, worked with an out-dated WMS. It wasn't uncommon to receive new merchandise into the system only to get an order for that same material 10 minutes later because someone in the assembly area was waiting on it. To shore that up,

By bringing parts and materials to the workstation, associates no longer have to walk through the warehouse to kit together parts and materials required on the assembly line.

Grob enhanced the standard functionality in SAP's WMS to support crossdocking, sorting routines for picking orders and the display of pictures of the materials that had to be picked.

Still, more work needed to be done. In 2013, the company decided to build a new logistics center.

Automation and software

Early on in the design process, Grob realized it needed to automate to bring all storage and activities under one roof. “The size of the facility we needed was going to be too large for one person to navigate to fill an order,” he says. “We looked at a number of different concepts, chose a completely automated storage system that delivers material to a worker who is residing at a picking station.”

The automation includes the eight-aisle, single-deep automated pallet ware-



house that delivers pallets to six pick stations. Order selectors can pick parts or cartons from a pallet that is then sent back into storage. Or, the order selector can divert an entire pallet to a pick-up station if it's required for the order.

The six-aisle mini-load system was designed to accommodate the variety of parts, components and materials required by Grob—everything from very tiny parts that are just a few millimeters in size up to bulky machinery components. Rather than have one long storage area, the mini-load is divided into two halves. “The advantage is that we can supply both sides with only one material



Once orders have been picked, they are loaded onto carts that are delivered to assembly stations on the line.

conveyor system connection,” Lisiecki says. It also shortens the distance that a load carrier has to traverse to retrieve and deliver a container. Buffer zones were created at the end of the storage system that will accommodate future expansion of the system if growth outpaces the current capabilities.

Coordinating the activities within the logistics center with the assembly line involved more than the installation of automated equipment. It also included integration of a new real-time WMS system with SAP, which manages the production schedule and master records. In this instance, the WMS manages the allocation of storage locations and the flow of goods. Meanwhile, SAP has visibility into the content of the products stored on the pallets and in containers. More importantly, SAP is the repository for additional functionality and information that an order selector may need to pick the right parts for an order.

“An associate may need additional information, like technical drawings, at the time of a pick,” Lisiecki says. “All of that is stored in SAP and is available to the worker on their screen at a picking station. They don’t have an interface—they have direct access to SAP.”

The last piece of technology that makes the system work is a camera-based vision system that captures images of pallets, containers and picks. The images captured by the vision system are analyzed to determine whether a pallet needs to be replenished or can be combined with materials from another pallet. They are also stored and can be used to verify the accuracy of a pick. “If the assembly area says that the wrong part was delivered, we can look back through the pictures to see what may have happened during the pick,” Lisiecki says.

Tying it together

As part of the new design, Grob implemented a crossdocking process for newly received materials that are required immediately on the assembly line or for spare parts for a customer. Instead of going into storage for processing later,

receivers are alerted at the dock and the material is immediately processed for the line, or packaged for a parcel delivery.

The last piece of the puzzle is the transportation of materials from the logistics center to the assembly areas.

In the past, lift trucks delivered orders. While they are still used for large and bulky parts, most material is transported on carts. In the picking areas, associates pick to containers that are then placed on carts. When an order is complete,

ZERO

Work planning
Sequencing decisions
Micro workforce deployment

50% improved productivity
COFE® makes history!

Find out how the most innovative retail market leaders are solving omnichannel fulfillment. **Contact us today for our free system analysis and consultation.**

877.876.6384

thinksmart@vargomail.com



Maximizing Resource Utilization
VARGOsolutions.com

the carts are delivered to a staging area near shipping and receiving. The carts are then released to the manufacturing plant on a just-in-time basis.

While delivery personnel initially took the carts to a specific assembly station, Grob has since modified that process to account for the complexity of its operations. Today, delivery personnel drop off a cart in an assembly area and pick up empty carts for return to the logistics center. Meanwhile, a specialist in that assembly area delivers the individual carts to the assembly station where the materials are needed.

The new logistics center began to ramp up in December 2013. By March 2014, Lisiecki says, it was running at speed. The bottom line, he adds, is that



Newly received material is loaded into storage totes and inducted into the mini-load AS/RS. Grob tracks nearly 2 million part numbers, some of which will only be used once.

they have fewer missing parts in orders, delivery is on time and in the right area, and Grob has a much better ability to plan in the logistics center. “We have reduced

errors and improved picking,” Lisiecki says. Since going live, he adds, Grob has expanded the original size of the AS/RS “and, we still have room to grow.”

From the warehouse to the assembly line

In Grob’s new parts and raw materials warehouse, automated and conventional storage work with goods-to-person picking to deliver parts to the assembly line.

Grob-Werke GmbH & Co. KG Mindelheim, Germany

SIZE: Total facility is 1.2 million square feet; the logistics center is 92,750 square feet

THROUGHPUT: About 7,700 requests for materials a day. Approximately 4,000 are managed by the mini-load system; about 2,000 are managed by the pallet handling AS/RS; with the remainder coming from manual storage areas.

PRODUCTS: Parts, components, and materials used to manufacture assembly machines

SKUS: Grob maintains records on 1.8 million different material numbers, although many are for one-time use. Typically, the system manages about 50,000 SKUs.

EMPLOYEES: 3,000 total at the facility, with approximately 150 in the logistics center, including 30 associates dedicated to picking.

SHIFTS PER DAY/DAYS PER WEEK: 2 shifts on 5 days plus 1 shift on Saturday

Grob’s new logistics center, the company’s term for its parts and raw materials warehouse, is adjacent to a 1.2-million-square-foot manufacturing facility. A pallet-handling automated storage and retrieval system (AS/RS), a mini-load AS/RS, conventional storage and goods-to-person picking methodologies provide the fulfillment engine that delivers parts to the assembly line. Meanwhile, a vision system captures information about the items being picked and the amount of product left on a pallet or in a storage container. That information is used

to improve the quality and accuracy of picks and to drive replenishment.

Receiving and putaway: Trucks are unloaded and processed in the receiving area (1). From there, incoming merchandise follows one of four paths.

1. For immediate use: Product that is required immediately for assembly is placed on a cart in the cart staging area (2) for delivery to one of the assembly lines in the adjacent manufacturing area (3). Similarly, some items may be packaged and staged in the shipping area (4) for delivery to

customers in need of spare parts.

2. Pallet-handling AS/RS: Product that is palletized on a Euro pallet receives a license plate bar code label and is delivered to the induction area (6) for the pallet-handling AS/RS (5). The remaining product can be palletized on a Euro pallet that is labeled for induction into the AS/RS (5).

3. Manual reserve storage: Items that are too large, heavy or cumbersome for the automated system are delivered by lift truck to the reserve storage area (7). The driver receives a suggested storage location from the warehouse

management system (WMS), but has the option of choosing another storage location. The driver scans the license plate bar code and the storage location to confirm putaway into storage.

4. Mini-load system: Materials destined for the mini-load system (8) are identified in the receiving area (1) and placed in a storage container that then receives a license plate bar code label. The containers travel by conveyor to the mini-load system induction area (9). The container is scanned by the camera-based vision system before it is automatically putaway into a storage location chosen by the WMS.

Regardless of the storage location, the enterprise resource planning (ERP) system tracks the identity of the products on the pallet. The WMS system only tracks the storage location of the pallet.

Picking: The facility manages three picking processes, including manual picking from the reserve storage area (7), the pallet-handling AS/RS (5) and

the mini-load system (8). Orders are downloaded from ERP system into the WMS and are then sent to a dispatcher who plans the work. They are released to the floor by a work center that monitors and manages the workflow in the logistics center.

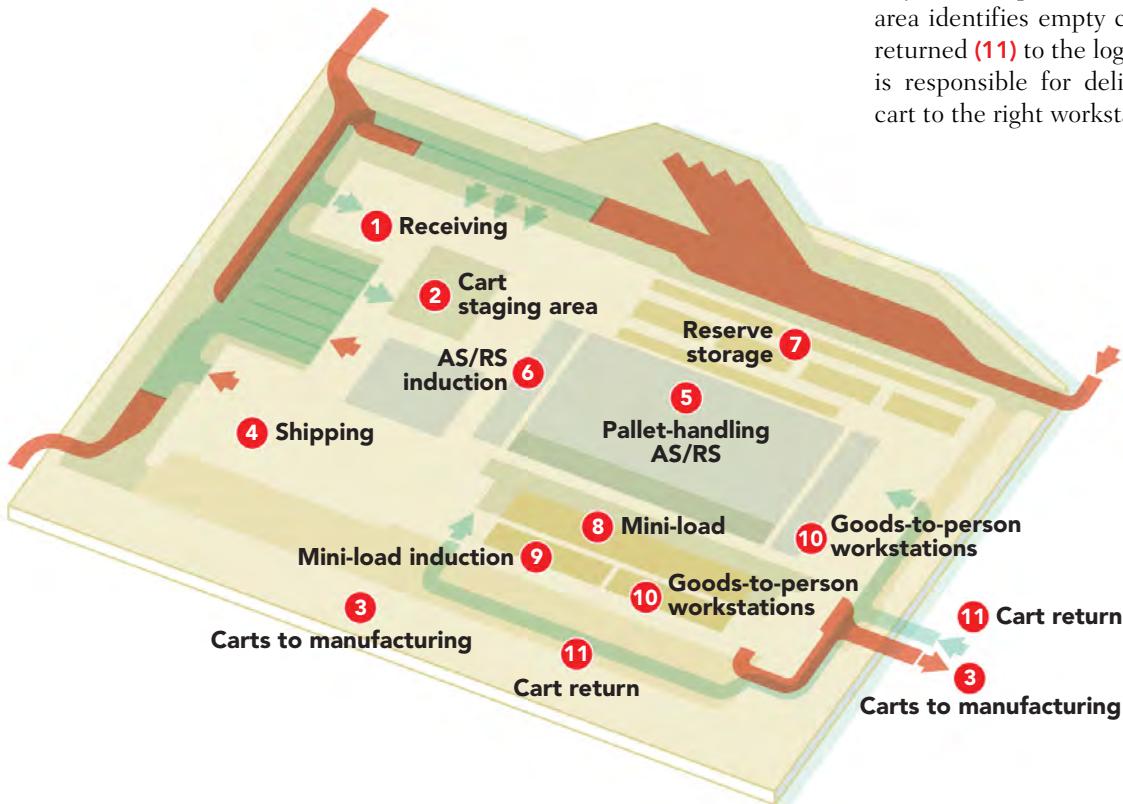
Items that are stored in the reserve storage area (7) are picked to a pallet by a lift truck operator and then delivered to the cart staging area (2). Meanwhile, pallets in the AS/RS (5) and storage containers are delivered to goods-to-picking stations in each area (10). The system delivers picking instructions to the order selector at one of the goods-to-person workstations (10). A pallet may be used in its entirety or just a few cartons may be removed and placed on a cart. Similarly, individual parts and items are removed from storage containers and placed in a carton on a cart. After picking is complete, the pallet or container is returned to storage in the respective area.

System suppliers

- SYSTEM DESIGN, PALLET HANDLING AS/RS, MINI-LOAD AS/RS, GOODS-TO-PERSON WORKSTATIONS, WCS & WMS
- INTEGRATION: viastore
- CONVEYOR SYSTEM: TGW
- SAP/ERP INTEGRATION: 24-LOG
- ERP SYSTEM: SAP
- CAMERA-BASED VISION SYSTEM: Vitronics
- CARTS: LKE
- RACKING: Stow
- LIFT TRUCKS: STILL
- BAR CODE SCANNING & MOBILE
- COMPUTING: Casio
- MOBILE COMPUTING SOFTWARE: Commsult

Once the last item for an order has been picked at the goods-to-person stations (10), the order selector is directed to take the cart to the cart staging area (2).

Cart delivery: Orders for carts are released on a just-in-time basis. The carts are delivered to staging areas for each of the assembly areas in the factory (3). A specialist in the assembly area identifies empty carts that can be returned (11) to the logistics center and is responsible for delivering the right cart to the right workstation. □



TOP 20 AUTOMATIC DATA capture suppliers

By Josh Bond, Senior Editor

Deadlines, data and finding solutions for each are pushing the end-user and supplier communities to adapt.

Editor's note: VDC Research Group no longer reports RFID market information. The analysis and graphs in this article reflect only the markets for rugged mobile device and bar code scanners and printers.

Last year, the global market for automatic data capture solutions (ADC) used in factories, warehouses and logistics applications reached \$5.968 billion in sales, according to VDC Research Group.

The 2014 global sales figures represent an increase of 3.8% from 2013's comparable estimate of \$5.75 billion, which had stayed level with 2012. VDC data projects the market will post a compound annual growth rate (CAGR) of 4% through the next five years before reaching \$7.2 billion in 2019. This includes a 4.6% CAGR for bar code scanners and printers, and a 3.2% CAGR for rugged mobile devices.

The ADC market includes handheld and stationary bar code scanning and imaging devices, bar code printers and ruggedized mobile computing solutions for the factory and warehouse. VDC's figures do not include consumables associated with automatic data collection, such as bar code labels.

In terms of global figures, each ADC market segment and about half of the Top 20 suppliers reported gains over last year, but a lot has changed in that time. According to Richa Gupta, senior analyst, AutoID and data capture for VDC Research, the dramatic fluctuation of currency exchange rates is one of the central stories of the year. "It is probably the biggest theme of how the market is shaping," Gupta says. "A strong U.S. dollar has had a very big impact on European vendors and on sales in Japan and China."

David Krebs, vice president of VDC's enterprise mobility and connected

devices, notes that heightened consumer demands are pressuring companies everywhere to change the way they produce and distribute products.

“Having identified the need for agile responses, more companies are looking at rugged mobile devices and related systems to help improve visibility and traceability within each facility and across the supply chain,” Krebs says. “With respect to mobile, the underlying theme still is the transition from legacy hardware and applications to modern ones. One thing that hasn’t changed is that the nature of the rugged mobile customer is as conservative as it has ever been. They are reluctant to change, especially in ware-

houses and materials management.”

With their challenge defined, suppliers report strong success in the past year as they, too, strive for agility in the face of rapid change.

The Top 20 ADC suppliers

Revenues for the Top 20 suppliers in 2014 totaled \$5.531 billion, up 27% from 2013. Eight of the companies reported revenue declines, for a combined 10.5% decrease. Not including the two companies that are new to the list, the remaining 10 companies posted combined gains of nearly 40%.

The new No. 1 is Zebra, which last year acquired Motorola Solutions’

enterprise business to leap from third place. Zebra had previously reported \$545 million in annual revenues, while Motorola had enjoyed several years at the top of the list with more than \$1 billion. The top two companies, made up of last year’s top three, grew 20%. Honeywell Solutions posted the highest growth rate at 43%, followed by Cognex (eighth place, up from 12th place, 35%) and SATO (fourth place, 14.3%).

Continued consolidation at the top has made room for two companies new to the list. Cab Produkttechnik GmbH, whose offerings include printing solutions, earned \$34 million in 2014 to

Top 20 ADC suppliers											
2014 RANK	2013 RANK	COMPANY	TOTAL 2014 REVENUES (in millions)	TOTAL 2013 REVENUES (in millions)	North American Headquarters	Web site	Bar code printers	Handheld scanners	Stationary scanners	RFID	Mobile computers
1	3	Zebra (Motorola Solutions, Psion)	\$2,081	\$1,881	Schaumburg, Ill.	zebra.com		X	X	X	X
2	2	Honeywell (LXE, Intermec)	\$1,098	\$765.8	Morristown, N.J.	honeywellaidc.com		X	X		X
3	4	Datalogic	\$484	\$453.1	Eugene, Ore.	datalogic.com		X	X	X	X
4	5	SATO	\$192	\$168	Charlotte, N.C.	satoamerica.com	X			X	
5	6	Toshiba TEC	\$153	\$153	Irvine, Calif.	toshibatec-ris.com	X			X	
6	7	Denso Wave	\$121	\$122.6	Southfield, Mich.	denso-adc.com		X			
7	8	Casio Computer Co. Ltd	\$90	\$92.9	Dover, N.J.	casio4business.com		X			X
8	12	Cognex	\$89	\$66	Natick, Mass.	cognex.com		X	X		X
9	9	SICK AG	\$86	\$92	Minneapolis, Minn.	sick.com		X	X	X	
10	10	Datamax-O'Neil	\$77	\$78	Orlando, Fla.	datamax-oneil.com	X				
11	13	Avery Dennison	\$68	\$64	Glendale, Calif.	averydennison.com	X			X	
11	15	Fujian Newland	\$68	\$59.8	Fremont, Calif.	newlandna.com				X	X
13	16	TSC Printers	\$56	\$54	Pomona, Calif.	tscprinters.com	X			X	
14	11	Bluebird Soft	\$51	\$75	Palisades Park, N.J.	mypidion.com	X				X
15	14	NCR	\$50	\$60	Duluth, Ga.	ncr.com	X	X	X	X	
16	N/A	Unitech	\$45	N/A	Los Angeles, Calif.	us.ute.com		X		X	X
17	17	Opto Electronics Co. Ltd. (Opticon)	\$43	\$49.6	Renton, Wash.	opticon.com		X			X
18	19	M3 Mobile	\$38	\$38	Iselin, N.J.	m3mobile.net		X	X	X	X
19	18	CipherLab	\$36	\$47.5	Plano, Texas	us.cipherlab.com		X	X		X
20	N/A	Cab Produkttechnik GmbH	\$34	N/A	Tyngsboro, Mass.	cab.de/en	X				

Source: VDC Research

AutoloD market analysis

Estimated global shipments of AIDC hardware (in millions of dollars)

	2012	2013	% Change 2012-2013	2014	% Change 2013-2014	2019	CAGR 2014-2019
Rugged mobile devices*	\$2,803.7	\$2,721.5	-2.93%	\$2,759.7	1.40%	\$3,230.4	3.2%
Bar code scanners and printers	\$2,956.7	\$3,030	2.48%	\$3,208.5	5.89%	\$4,015.8	4.6%
TOTAL	\$5,760.3	\$5,751.5	-0.15%	\$5,968.2	3.77%	\$7,246.2	4.0%

*Includes forklift, handheld/mobile devices and wearables

Source: VDC Research

claim the 20th spot. Unitech earned \$45 million with its handheld scanners, mobile computer and RFID solutions, making a solid debut in 16th place.

“Last year we mentioned a number of smaller vendors that were taking share away from leading vendors such as Datalogic, Zebra and Honeywell,” Gupta says. “In 2014 there was a resurgence of the big three, all of which did pretty well in their core markets. Zebra had a good year with its legacy solutions like mobile and stationary bar code printers, which, overall, did better than the new business acquired from Motorola. And, 2014 saw mixed results for smaller vendors, but 2015 is looking better for them already, at least in the United States.”

The bar code printer and scanner market

Having followed the trend for the past few years, Gupta says the continued migration from 2D cameras to image-based scanning technologies has gained speed. “Back in 2013, the decline in 2D sales took vendors by surprise, but not anymore,” Gupta says. “Vendors are prepared for that migration and are in some cases actively transferring customers to image-based systems.”

Because the systems can scan 1D and 2D bar codes, take images, and automatically capture more data than in the past, Gupta says she has heard stories of imaging solutions that have brought about efficiencies. By combining all of those functions in one place, it might no longer be necessary to operate separate conveyor belts for 1D, 2D

or absent bar codes.

In other trends, the wearable market in warehousing and distribution is still virtually non-existent, but Gupta says she is hearing a lot from suppliers about transferring mobile functionalities into wearable form factors. For now, from a bar code scanning standpoint, some vendors are working to figure out what the right wearable form factor is. “Will they only be used in applications where workers must use their hands, or is there a market for wearable outside of a hands-free environment?” Gupta asks. “The discussion is largely centered in the logistics vertical—warehousing and distribution and delivery.”

From the printing side, Gupta notes a strong push toward color label printing, driven by compliance with globally harmonized systems (GHS). These often require a minimum of two colors for on-demand label printers. Gupta says it’s been an opportunity for data capture providers, many of which are in the process of developing or promoting such solutions.

Trends in the rugged mobile device market

Consolidation has several implications for the wider industry, Krebs suggests, including the software platform landscape. Android operating systems continue to pursue Microsoft, the overwhelming market leader, and although end-users in the warehouse remain somewhat Windows-centric, the Android platform has continued to grow.

“It remains to be seen if everyone will go to Windows 10 Mobile or if Android will reach critical mass,” Krebs says. “For now, there are very different markets for rugged handhelds and smart phones, but we will probably enter a space in the near future where there will be more than one option for mobile operating systems in the warehouse.”

The recent announcement by Microsoft that Windows 7 security support will end in 2020 has added some urgency to the decision.

“Everyone is facing this deadline at the end of the decade, when most or a portion of this critical software

Collecting the data

This is *Modern’s* 13th annual look at the leading manufacturers of ADC hardware and solutions. Because the industry includes public and private companies, this is the seventh year in a row that VDC Research Group compiled our data. Since they are covering this technology every day, they are closer to the market.

To make our list, companies must sell in North America, though the chart includes worldwide revenues. *Modern* does not include resellers, systems integrators or other companies that do not manufacture ADC hardware. Since our readers are primarily focused on supply chain solutions, we do not include companies whose primary focus is the retail checkout counter or non-industrial settings, like hospitals, libraries or resorts. Nor do we include companies that only manufacture consumables like bar code labels and RFID tags.

will need to be rewritten," Krebs says. "Customers wonder if they should wait for Microsoft to show them something viable, or if they abandon Microsoft and adopt Android. What am I losing or missing if I continue to wait?"

The nature of end-users' software applications hasn't changed much in 10 to 20 years, he says. In addition to innovative solutions, suppliers have been challenged to support the migration of legacy apps, which Krebs suggests was a factor in Zebra's decision to acquire business units that specialize in migration. "There are lots of green screens and legacy apps," he says, "and they're being supported by much more capable devices."

These devices are also helping to gradually erode silos within organizations. "It is still common for companies to operate with the idea that what goes on in the warehouse is one thing and distribution is another," Krebs says. "But as they collect more data, we are seeing more sharing of that information."

Of course, pharmaceutical as well as food and beverage companies are compelled to comply with regulatory mandates, but Krebs says high-value items are increasingly handled with greater tracking discipline, even in the absence of regulatory pressure. More sophisticated technologies such as RFID are penetrating those spaces.

"We've seen a small renaissance for RFID in apparel, and there's nice growth there," Krebs says, "but we still haven't seen RFID penetrate the warehouse in any great way."

Krebs is also watching trends around the impact of the Internet of Things on manufacturing and distribution. He suggests organizations are taking a more holistic approach. "Technologies that enable remote diagnostics and monitoring are central to the feedback loop," he says. "Data might come from an individual performing maintenance on a product, where devices help track service history and offer multiple modes of data input."

In the near future, Krebs anticipates the wearable form factor, particularly heads-up displays such as those

developed by Google and the military, will not reach a price point that could lead to significant disruption in warehousing and distribution. "That said, VDC is very keen to watch developments around heads-up displays," he says. "The next two to three years

could see significant advancements in price and performance. For now, battery life has not been impressive and the ergonomics need work, but there is relevance in a lot of environments when you think about things like augmented reality." □

EdgeGard
WILDECK
Folding-Rail Gate

DOCK SAFETY SOLVED



Straight-Rail Gate

Protect personnel with EdgeGard™ Dock Gates.

EdgeGard™ Gates are superior by design, easy to install, and even easier to operate. They help protect personnel from falling off wide truck pits and loading docks. The unique Folding-Rail Gate protects wider openings up to 12 ft., while minimizing the required gate clearance height. A Straight-Rail Gate easily handles standard openings up to 10 ft.

Say **YES** to loading dock safety and **NO** to lost time accidents with a Wildeck EdgeGard™ Gate. It's a level of quality and craftsmanship you won't find anywhere else. **800-325-6939 or WILDECK.COM**



STORING
Get the most out of your space



LIFTING
Move inventory with ease



GUARDING
Protect your facility



©Wildeck, Inc. 2015 WEDG 1205 AD



RFID can automatically capture item-level inventory data without extra handling, leading to improved visibility for many types of goods. Here's a look at how companies are aiming to make the most of that visibility.

By Roberto Michel, Editor at Large

Is **RFID** ready for a

Back in the early 2000s, the tech term radio frequency identification (RFID) became much better known to people in business because big players in supply chains including Walmart and the U.S. Department of Defense were piloting RFID technology to track inventory. The thinking then was that with such major players pushing RFID, it would soon become a mainstay method of tracking goods in supply chains, perhaps even eclipsing the bar code.

As it turns out, the bar code is alive and well, and RFID, while steadily evolving in use and capabilities, has not taken over as the *de facto* technology for data capture. SML Group, a supplier that provides RFID solutions for the retail industry, estimates that only about 5% of the retail sector has adopted RFID.

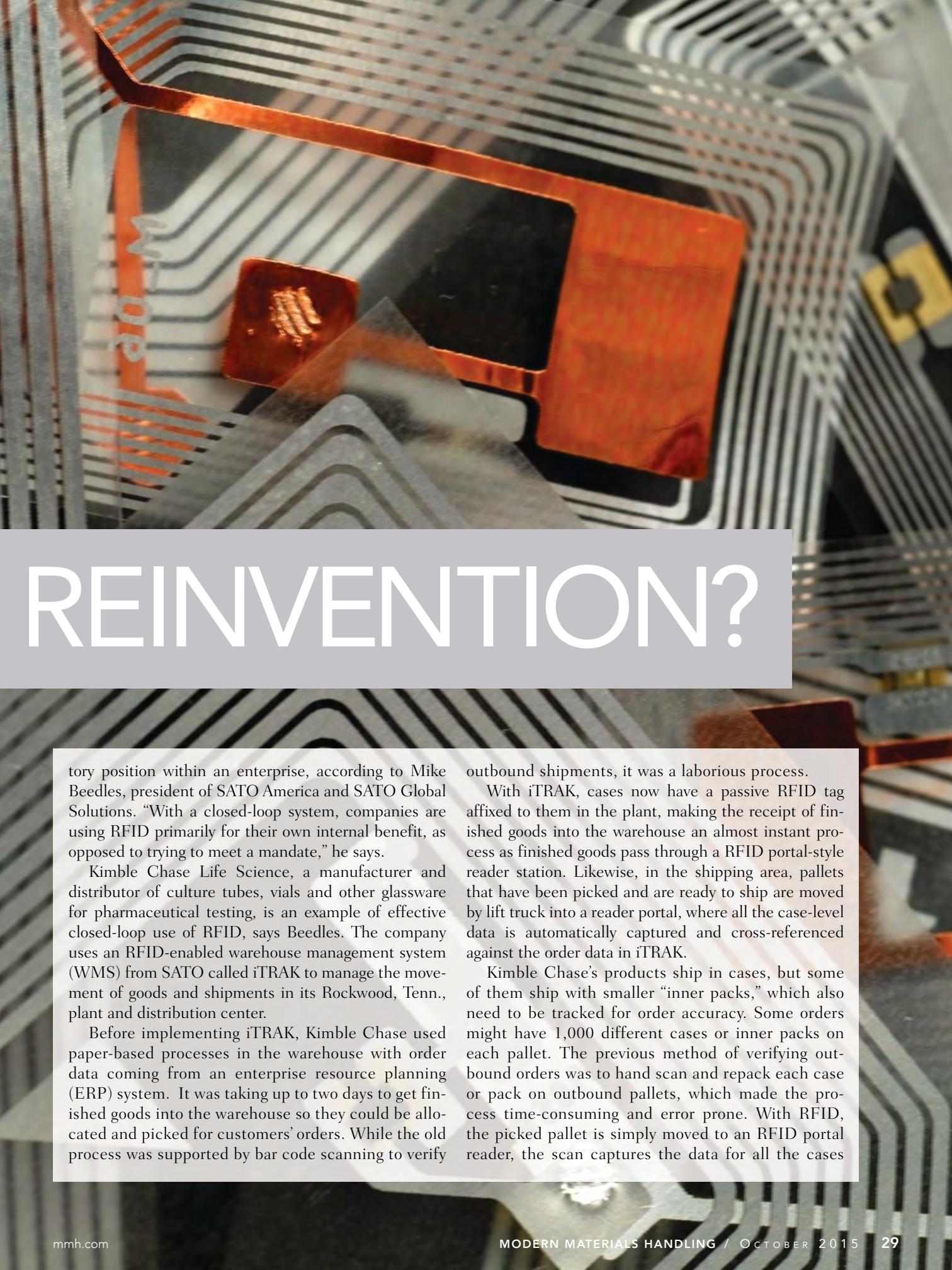
So, can RFID finally break through to wider adoption? While much has been made about the higher cost of RFID tags versus paper bar codes, the cost of the tags is only one factor to weigh. The real question is: How can organizations fully leverage the visibility they

can get from RFID? While part of RFID's benefit is that for many types of goods it can make data collection less labor intensive, the bigger factor that will spur RFID adoption may turn out to be what companies can do with that precise, item-level visibility once they have it.

Device and solution vendors say that RFID use will evolve and spread in the retail sector, spurred by the potential of using item-level visibility to transform the in-store experience for consumers, while also keeping better tabs on inventory for omni-channel fulfillment. Meanwhile, in other sectors such as manufacturing plants and distribution centers, as well as hospitals and clinics, RFID has been used to track work in process (WIP), improve order accuracy, and provide tighter control over item-level traceability and inventory replenishment.

Evolving use

Many of the most successful RFID deployments have been "closed-loop" systems aimed at efficiently and accurately capturing material flow and inven-



REINVENTION?

tory position within an enterprise, according to Mike Beedles, president of SATO America and SATO Global Solutions. “With a closed-loop system, companies are using RFID primarily for their own internal benefit, as opposed to trying to meet a mandate,” he says.

Kimble Chase Life Science, a manufacturer and distributor of culture tubes, vials and other glassware for pharmaceutical testing, is an example of effective closed-loop use of RFID, says Beedles. The company uses an RFID-enabled warehouse management system (WMS) from SATO called iTRAK to manage the movement of goods and shipments in its Rockwood, Tenn., plant and distribution center.

Before implementing iTRAK, Kimble Chase used paper-based processes in the warehouse with order data coming from an enterprise resource planning (ERP) system. It was taking up to two days to get finished goods into the warehouse so they could be allocated and picked for customers’ orders. While the old process was supported by bar code scanning to verify

outbound shipments, it was a laborious process.

With iTRAK, cases now have a passive RFID tag affixed to them in the plant, making the receipt of finished goods into the warehouse an almost instant process as finished goods pass through a RFID portal-style reader station. Likewise, in the shipping area, pallets that have been picked and are ready to ship are moved by lift truck into a reader portal, where all the case-level data is automatically captured and cross-referenced against the order data in iTRAK.

Kimble Chase’s products ship in cases, but some of them ship with smaller “inner packs,” which also need to be tracked for order accuracy. Some orders might have 1,000 different cases or inner packs on each pallet. The previous method of verifying outbound orders was to hand scan and repack each case or pack on outbound pallets, which made the process time-consuming and error prone. With RFID, the picked pallet is simply moved to an RFID portal reader, the scan captures the data for all the cases



RFID-based inventory visibility in retail, combined with apps for shoppers and store associates, would enable a retailer to service shoppers in new ways, such as bringing them exactly what they wish to try on next.

and smaller inner packs within seconds, cross referencing it against the order data in iTRAK. As a result, the RFID-enabled WMS has dramatically improved the accuracy of outbound orders and of finished goods in the warehouse pick bins.

A key driver of internal benefits is RFID's ability to accurately and quickly scan many items at once without having to institute processes such as picking items to a conveyor and passing them through a fixed-position scanner. "The more touches involved in data capture, the more inefficient the process is and the more potential you have for errors and damage," says Beedles.

RFID's accuracy also leads to fewer stock outs in retail supply chains, notes Beedles, but in the retail industry, RFID use is evolving to allow retailers

to provide a better customer experience and drive additional sales. For example, he says, SATO is working on an RFID-enabled store application that can track the items a shopper is trying on in a dressing room.

The tablet app is interactive for shoppers and store associates, explains Beedles. If the fit or color for an item isn't right, the customer can access a screen in the dressing room to see optional sizes or colors which are in stock in the store and select to have that item brought to the dressing room by a store associate. Such store applications could also let a customer know about accessories or other garments that complement an item, or that are on sale and related to the items the customer is trying on.

Such next-generation apps will build off the potential value of having RFID

tags on most items, and reader infrastructure within the store that pinpoints where everything is, says Beedles. "So now that I have all the garments in a store tagged, it's about adding value through upselling and cross-selling, and providing a better customer experience," Beedles says. "Retailers will be able to provide a concierge-type of shopping experience."

Retail reinvention

RFID will continue to catch on with retailers and in other sectors such as health care and manufacturing because of its efficiency in supporting pinpoint visibility, says Mark Wheeler, director of supply chain solutions with Zebra Technologies. Wheeler calls the trend "pervasive visibility," and says RFID technology is well suited to the challenge of controlling inventory in stores,

Lift up Savings. Lower Costs.

Here's what electric forklifts carry into your facility: 40% lower maintenance costs; up to 80% lower fuel costs; 30% longer life than internal combustion vehicles; better air quality; smoother handling; less noise pollution; even less downtime, thanks to fewer moving parts.

All of this adds up to \$1 or more per hour savings in operating cost for each vehicle. Why would you use anything else? To learn more about electric handling, call the Business Call Center at 1-888-655-5888.

Learn all about electric transportation and more at our new Customer Resource Center. Visit georgiapower.com/crc or call 770.216.1400.



right down to knowing what is on each shelf on a daily basis.

The challenge is that stores are a much “less controlled” environment for inventory locations than a warehouse, says Wheeler, where bar code rack and bins, WMS pick instructions, and bar codes to verify locations give users a high degree of confidence that cases and items are going to be where the system says they are going to be.

“I don’t have that level of confidence in a store because I have customers coming in every day, moving things around, buying items and point of sale might not be 100% accurate,” says Wheeler. “All of that contributes to a situation where I really don’t know what I have on hand in the store.”

Store associates using handheld RFID readers can quickly scan racks and shelves to capture data from tagged apparel or other tagged items, keeping track of where all the items are on the store floor without having to handle each item. “What item-level RFID allows the retailer to do, in effect, is take a full physical inventory of items every single day, and it’s simply not practical to do that with any other technology,” says Wheeler.

To give more options to retailers and other businesses for RFID hand scanning, Zebra has recently developed a sled that fits over Android and iOS devices to allow a consumer type device to perform RFID scans. Zebra also provides industrial handhelds with integrated RFID scanners.

Initially, observes Wheeler, the push for RFID in the retail sector was more about the big retailers wanting to know what’s in the backroom and



in the store to avoid stock outs. Now, Wheeler says, there is a shift toward using RFID’s item-level visibility to transform the customer experience. Because items are tagged, applications can be built to better market specific goods of interest to consumers while they are in the store.

The other benefit of knowing the precise location of items in the store is that retailers who have an omni-channel strategy that involves fulfilling some e-commerce orders from stores have a much better knowledge of where items are at the store level. “As omni-channel continues to grow, some retailers want the option of filling orders in the most cost-effective way,” says Wheeler. “That might be from a store, or it might be from a distribution center,” says Wheeler. “With RFID, you can get to that greater level of inventory control in stores that is needed to support online inventory allocation and fulfillment.”

Conventional passive RFID does not work flawlessly in all situations. Metals can interfere with the RFID data capture, while liquids tend to absorb signals, explains Mike Burnham, president of Panatrack. What’s more, the

RFID sleds that attach to popular smart devices give retailers more options for the device types that store associates can use to perform RFID reads.

core strength of RFID—its ability to capture data about many tagged items at once—can be seen as a detriment if you want to isolate one item and collect data about it in close proximity to other tagged items. “It is difficult to isolate individual items in an RFID situation,” Burnham says.

Panatrack has helped companies deploy RFID solutions, including a program with Best Buy. “When Panatrack did its work with Best Buy and piloted the use of passive RFID on DVD cases, we used a handheld device to go up and down the retail store aisle and read as many tags as we could so we could to confirm the inventory on the shelf,” says Burnham. “The problem is that when you wanted to remove a single piece of inventory from the shelf, we wound up having a hard time reading a single SKU or pallet in an open environment full of tagged items. You are better off with a bar code to take individual items out of inventory, fulfill orders, transfer inventory and perform other essential transactions.”

In the Best Buy pilot, there was some special tuning of the RFID solution needed, says Burnham. Panatrack

Companies mentioned in this article

- Panatrack
- SATO America/SATO Global Solutions
- Zebra Technologies

MODERN information management

worked to configure and control the readers, he says, and put some heuristics in the inventory management software to allow a degree of “forgiveness” in the event that a tag was not found. “We were basically going down the aisle, reading as many tags as possible, and allowing a grace period in the event an item was not found,” he says. “The software would then check again in a few days, and if it was not found by then, it would assume it was really gone.”

What to expect

RFID can make perfect sense in situations in manufacturing plants or other environments where there is the need to keep constant, close track of high-value items or equipment. Active RFID, a form of RFID in which the tags have battery power and are intermittently sending out a signal so that location status can be updated, can be a suitable solution to closely monitor the location of expensive, mobile assets, says Burnham.

Passive RFID has been used successfully in manufacturing settings for WIP tracking, adds Wheeler. RFID chips on vehicles on an assembly line, for example, can trigger WIP updates and trigger work instructions in a manufacturing system.

RFID technology itself continues to evolve. SATO, for example, offers a form of RFID called phase jitter modulation, which is optimized for capturing data on closely stacked items, and it has deployed the solution in the health care market, for tracking items such as the parts in kits for joint replacement surgeries.

Suppliers also have been working on ceiling-mounted readers for retail stores so tagged inventory can be monitored without relying on store associates performing hand-held scans. The evolving use of RFID in retail stores also may be boosted by complementary technologies such as Bluetooth Low Energy, or “BTLE,” a wireless communication standard with low power consumption.

Wheeler says Zebra has a solution called MPact that uses BTLE and small beacons dotted throughout the store to enable real-time positioning of where consumers with smart phones are in a store, and how long they dwell in a spot. The idea is that consumers would opt-in for apps that would allow a retailer to offer them a better shopping experience, based on this real-time positioning.

The MPact solution isn't RFID, but would be complemented by item-level inventory visibility with RFID. It fits in with what many vendors see as one of the next frontiers for RFID—transforming the way retailers can serve their customers and market to them while they are in the store. □

You can purchase this



Or you can purchase this



Make the most of your rack investment with FREE professional rack engineering services.

REB Storage Systems International's services ensure:

- ▶ Your rack layout is optimized for your storage needs.
- ▶ Your rack system complies with all codes, seismic demands, zoning regulations, and slab configurations specific to your area.
- ▶ Material handling equipment is integrated in the best possible locations to facilitate your product flow.



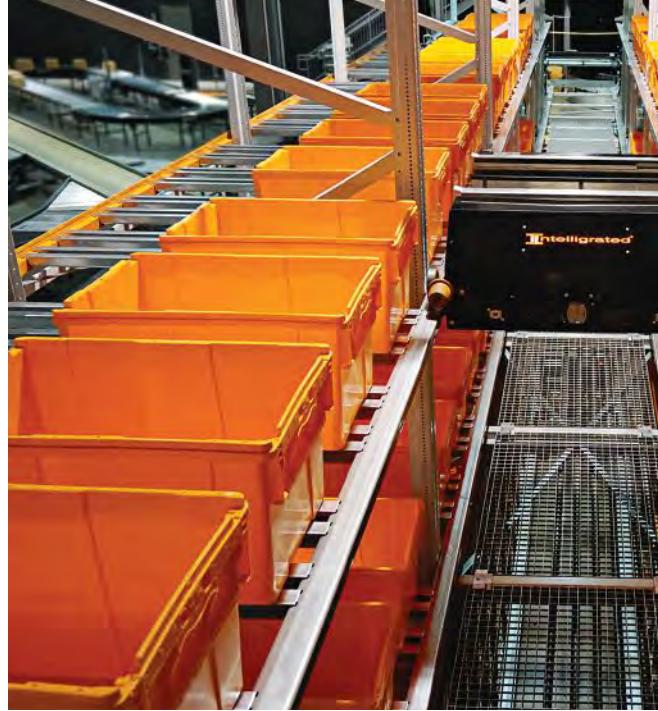
REB offers free professional engineering services on all rack projects when you purchase the rack from us. Contact us to receive these services and ensure a safe, compliant, optimized rack system.

www.rebstorage.com/eng

Phone: 773-382-0093
Email: info@rebstorage.com



A variety of equipment and installation options lets operations customize their handling to match inventory profiles, customer demands.



Flexibility: The hallmark of today's automated goods-to-person installations

By Sara Pearson Specter, Editor at Large

Goods-to-person is blowing up. If you feel like you're seeing and reading about growth in goods-to-person automation installations at every turn, you are not alone. This growth is being driven by e-commerce and omni-channel. E-commerce distributors need to fill more one- and two-line orders in compressed timeframes with a dwindling and aging labor market. Plus, omni-channel operations that fill orders for multiple channels—brick-and-mortar stores, wholesalers, home deliveries and parcel shipments—need to apply the appropri-

ate goods-to-person solution to match the outbound order's requirements.

Technologies once applied to store slower-moving, broken case inventory in a compressed footprint—such as automated storage and retrieval systems (AS/RS), shuttles and horizontal carousels—have evolved to offer benefits beyond space savings for investment justification. New developments in those systems, along with new mobile robotic solutions, give operations more flexible installation and application options.



Many goods-to-person systems combine multiple technologies to optimize flow, for example, using AS/RS to store overstock. Instead of delivering to the end of the aisle, the AS/RS automatically replenishes adjacent carton flow rack holding the fastest moving, manual-pick items, and goods-to-person shuttle systems that hold three days of inventory.



At the person end of a goods-to-person system, order put walls (shelves of cubbies that separate individual orders) can be equipped with light-directed pick or put modules to indicate which SKU goes to which order and in what quantity—maximizing throughput and improving accuracy.

The latest developments

Gone are the days of an eight-figure dollar investment for a single AS/RS storing every stock keeping unit (SKU), with idle space left for future expansion, says Bill Leber, director of business development and marketing at Swisslog Logistics. Instead, systems have become more modular to support anticipated growth. That allows for more modest investment in an installation that meets today's needs, but can easily scale up.

"Today's installations are in the seven-figure range, and many times less than \$5 million," adds Leber. "No one technology can do it all; we're seeing more hybrid systems with different types of goods-to-person automation in a single facility. You can match each technology to different inventory profiles and handling characteristics to create the right total solution."

Leber also attributes the uptick in goods-to-person installations to their increased visibility in the market. "The technologies have become more mainstream and less of a high-risk investment," he adds. "And, the cost of capital



A goods-to-person system eliminates travel and search time, plus improves ergonomics, by delivering items to workstations with height adjustments and footrests.

is extremely low, which makes net returns on invested capital very attractive."

One of the first solutions offered in the goods-to-person picking realm was mini-load AS/RS, says Ross Halket, executive director of automated sys-

tem design sales at Schaefer Systems International.

"Concentrating slow- and medium-movers from 20,000 square feet of floor space into a mini-load that takes 4,000 square feet, letting an operation increase pick rates from 80 to 120 lines per hour," Halket says. "The maximum pick rate for a person is 1,000 lines per hour; a mini-load needs nine cranes to support that rate."

That's not to say mini-load (or unit-load) AS/RS isn't deployed in today's goods-to-person installations. Rather, most current systems combine multiple technologies to optimize flow—and using AS/RS to store overstock destined for manual and automated goods-to-person picking.

"Instead of delivering to the end of the aisle, an AS/RS automatically replenishes adjacent carton flow rack holding the fastest moving, manual-pick items, and the goods-to-person shuttle systems, too," Halket explains. "Because shuttles are typically more expensive, they might hold three days of inventory, while 25 days worth is held in a mini-load."

Goods-to-person benefits

The ideal handling application for goods-to-person systems is generally medium- to slower-moving SKUs accessed infrequently and typically stored on static shelving in a distant portion of a facility. That requires pickers to spend extensive time traveling to, and searching for, items.

Instead, a goods-to-person system eliminates travel time and improves ergonomics, delivering items to workstations with height adjustments and footrests—all of which contributes to a significant reduction in order processing time, says Dematic's Khodl.

"Because of the productivity gains," he says, "goods-to-person picking might extend order cutoff time to 6 p.m., whereas a person-to-goods picking system might require a 2 p.m. cutoff time. The facility still makes its carriers' deadlines—and gets more orders through."

Depending on the installation and its control software, goods-to-person systems allow operations to bypass wave picking, says Intelligrated's Reese. "If someone orders an item late in the day, but pays a premium for same-day shipping, that order can automatically be prioritized to the top of the list. That's simply not possible with paper-based picking."

Further, adds Swisslog's Leber, training on automation is easier than on manual systems, appealing to companies with seasonal labor spikes. "If you periodically need temporary help, it can take up to a month for a new staffer to be fully comfortable with voice- or radio-frequency (RF) directed picking and the facility layout. According to one of our customers, learning our AutoStore system takes maybe 20 minutes," he says.

GENERATE POWER AND PROFIT FOR YOUR DISTRIBUTION CENTER USING

CUBISCAN[®]



Generate a Perfect Storm in Your DC

Energize warehouse space and blast high shipping costs using valuable cube and weight data.

Find out more at CubiScan.com

 **CUBISCAN**
CUBING & WEIGHING SYSTEMS BY **QUANTRONIX**

800-488-CUBE info@cubiscan.com

Matrix, Schaefer's newest shuttle offering, incorporates multiple lifts throughout each aisle to eliminate end-of-aisle bottlenecks experienced by traditional AS/RS and to speed throughput. "Matrix lets a facility access any SKU from any storage point and deliver it to a workstation at any time, minimizing the number of waiting totes," he says.

It's also no longer the case that an extensive installation of conveyor or loop sorter is needed to move the totes from storage to people, says Lance Reese, technical solutions director for order fulfillment at Intelligrated. "Now, shuttles are more agile and come in a range of different flavors," he says. "Some are carrier independent and can run on different levels, as opposed to being restricted to certain levels of a system."

Kevin Reader, director of business development and marketing for KNAPP Logistics Automation, agrees, noting multiple shuttle design variations enable a range of uses within in a goods-to-person application—including storage, sequencing and replenishment, while simultaneously managing overstock, picking and returns.

"Shuttles can handle totes and cartons in the same system. We also install single-, double- and triple-deep load handling mechanisms in shuttle systems up to 18 meters (59 feet) high for maximum density with minimal productivity loss, because item locations are that much closer to the pickup and delivery stations," he says.

Should seasonal spikes occur, multiple shuttles can run in a single aisle, Reader continues, or they can move from aisle-to-aisle and level-to-level. "The variants in shuttle design make these systems highly responsive and flexible to change. They're also modular. So, if a shuttle breaks down, it can be replaced."

Robotic goods-to-person picking systems, like Swisslog's AutoStore and the Perfect Pick from OPEX, also offer handling flexibility and scalability—making goods-to-person automation cost justifiable to companies doing less than \$50 million a year, says Jeff Hedges, presi-

dent of OPEX Material Handling.

"Our robotic technology is uniquely flexible and scalable. The number of iBOT robots deployed is based on the throughput rate and storage capacity a specific operation requires," he says. "Both the system's footprint and the process can be easily expanded as a business grows, in part because the iBOTs, which can be driven in and out of an aisle in a matter of seconds, don't require transfers, lifts and conveyors to deliver items to a remote workstation—they deliver directly to the workstation, which is integrated into the storage aisle."

Kardex Remstar will bring a new technology to the United States in 2016 that will target mid-sized operations with volume handling needs in the 4,000 to 6,000 units per hour range, says Thomas Coyne, regional director and president of North American operations.

"Horizontal carousel goods-to-person picking requires a batch process to get a high level of productivity, but it's limited to roughly eight orders maximum," Coyne explains. "Instead, our new system puts 200 to 300 stationary order totes to be picked at one time around a sortation device that brings SKUs to the operator. For operations considering carousel technology, this new system will increase their pick rates enormously at a more easily cost justified investment level than multi-shuttle systems."

But, software is key to making any goods-to-person system work—that is, ensuring that the required SKUs arrive at the right workstation at the same time the order is ready to be filled, says Mike Khodl, vice president

of solution development for Dematic.

"For proper sequencing, the software algorithms have to optimize and correctly build the flow of stored SKUs to the workstations processing the orders," he explains. "Ours considers SKU velocity and cube, the order makeup that includes those SKUs, and the productivity requirements in terms of target fulfillment rate and order cutoff time."

Workstations improve operator speed, accuracy

At the person end of a goods-to-person system, workstations are likewise being flexibly configured to maximize throughput and improve accuracy. Workstations and adjacent order put walls (shelves of cubbies that separate individual orders), can be equipped with light-directed pick or put modules to indicate which SKU goes to which order and in what quantity. Some suppliers offer light curtains that verify the number of picks placed in order totes. Others include a large screen to display an image of the item that needs to be picked.

Dematic, says Khodl, recently introduced the off-board Laser Put solution as a lower cost replacement for light-directed picking modules on put walls. "The operator scans the item and the laser projects a beam of light to one or more put destinations. It can also project text on the shelf front to relay a message about quantity," he says.

For operations filling 5,000 or more orders per day, systems can be engineered to deliver up to 1,400 items per hour to a workstation. Yet, with these rates starting to outpace the ability of a given operator, Khodl says, "we're offering conversions to robotic picking."

Further supporting future goods-to-robot picking, says Reader, is integration of vision systems and software technology into workstation operation. "The technology looks at the items, shapes and colors to identify each item, then directs a picker to a unique SKU for picking out of mixed totes. The same approach is now operating in robotic picking and packing cells," he says. □

Companies mentioned in this article

- Dematic
- Intelligrated
- Kardex Remstar
- KNAPP Logistics Automation
- OPEX Material Handling
- Schaefer Systems International
- Swisslog Logistics



MORE THAN A VISION
THIS IS **SICK**

Sensor Intelligence.

In industrial environments, providing an effective solution to capture reality requires more than just a vision. With SICK you have the choice. Multiple dimensions, one philosophy: customer needs come first. Even in the face of the most challenging requirements, SICK supports you to realize your vision. Our broad 2D and pioneering 3D vision portfolio based on decades of innovation leadership helps customers worldwide. Positioning, inspection, measuring and reading – all at the same time, if needed. Our global technology experts are specialists in your industry and are located in your corner of the world. SICK's vision sensors see your world as it truly is. We think that's intelligent. www.sickusa.com

Slot leadership

Whether distributors are new to warehouse management software or as sophisticated as they come, many are sitting on opportunities to improve slotting, spending and service levels.

By Josh Bond,
Senior Editor

Some of the most rewarding investments in distribution operations target labor costs and productivity. Under the circumstances—SKU proliferation, shrinking lines per order, demanding service levels—it seems strange that slotting, one of the most effective tools for pick optimization, is widely underutilized.

“The odds are that anyone reading this story has tried to solve the slotting problem, either manually or with applications,” says Tom Kozenski, vice president of industry strategy for JDA Software. “We’re now at a tipping point. Slotting

has never historically been expensive, but now the affordability and return on investment make it a no-brainer.”

Put simply, slotting is the science of ensuring fast-moving SKUs stay accessible and slow-movers stay out of the way. But the problem with slotting is how easy it is to ignore. Orders come in, and the No. 1 priority is shipping boxes. Since slotting is a planning function, it often quickly descends on the list of priorities as execution moves to the forefront. Soon enough, a forward pick location will run out of inventory and the panic begins.





“You see less chaos in a well-slotted warehouse because there aren’t all these stockouts or people yelling on a radio, calling Frank on the lift truck to drop a pallet,” says Keith La Londe, director of sales engineering for PathGuide Technologies. “They tend to be more professionally run warehouses. One of our potential customers toured someone else’s facility and felt that the operation wasn’t a good match for their own because the activity levels seemed so much lower. It was so much quieter. They later learned that the facility produced greater volumes than their

own—with fewer people.”

Conceptually, it can be hard to justify moving product around if it doesn’t add immediate value. After all, the inventory manager has done their job, so why use operations resources to manage something that’s already been managed?

“There has to be a dedicated amount of time to do slot maintenance work prior to execution, and that’s where we’ve seen things fall down,” says Dan Basmajian, president and CEO at Optricity. “It requires senior management buy-in, and you have to see the

A simple spreadsheet could improve slotting, but even bigger gains are in forward-looking capabilities.

value of handling the box not twice, since you will handle it twice anyway, but in advance. It’s still low-hanging fruit after 30 years.”

Slotting from scratch

Depending on the starting point, improved slotting can create tremendous gains. Bob Kennedy, vice president of business development for DMLogic,

says companies that don't use a slotting application could start using a spreadsheet, review it twice a year, and still see a huge improvement.

"Looking at it more often is better than less often, even if you're a very sophisticated company and use a slotting solution, simply because perceptions of business and realities are often different," Kennedy says. "Look at your slotting rules and configurations and see if they need change, at least on a quarterly basis."

Consider an operation with 1,000 SKUs on one or more pick lines, perhaps with mezzanines and conveyors and employing 25 to 50 people working on high-volume picks. If that type of operation is not optimized, Kennedy says, the amount of walking is enormous, and a 30% travel reduction could be possible. "Just think," he says, "of how many times a picker goes by a slower product to pick a faster one."

La Londe says customers new to slotting might start with the top 100 fastest-moving items, the 100 slowest, and make gradual improvements. "It can be a huge undertaking," he says, "but once you have the entire warehouse correctly slotted, it's all about maintenance."

For those working with a spreadsheet, Basmajian suggests starting with a velocity report that includes, if possible, the size of the slot opening. This will enable you to calculate how many days of inventory each location should hold. "That said, a spreadsheet can help you do it in two dimensions, but can't account for all the other dimensions," he says.

One of the most fundamental balancing acts is between picking and replenishment. A pick location with one week of inventory means replenish-



Well-slotted facilities are less hectic than others and often achieve higher volumes with fewer people.

ment only needs to drop one pallet a week, but pickers have to travel an extra 10 miles in that time. On the other hand, if there is only one hour of inventory in a slot, pickers walk inches, but replenishment personnel are swamped.

Optimal slotting might consider picking, replenishment, receiving, shipping, storage media, the SKU weight, dimensions, packaging and fragility, product family groupings, store-ready pick sequences, SKU velocity and volatility, marketing and promotional initiatives, and as many as 20 other criteria. That's where software applications come in.

Keep Bs from creating honeycombs

Slotting strategies generally come in two fundamental flavors: fixed and dynamic. The fixed slotting strategy strives to optimize item locations in pick areas as each item's velocity tapers or grows, or as SKUs come and go.

According to Marc Wulfraat, founder and president of consulting firm MWPVL International, the greatest focus on optimizing slotting is among distributors and retailers handling 5,000 or more SKUs. Those whose SKU bases remain relatively consistent throughout the year will lean toward fixed slotting, and those with greater volatility or extreme seasonality will tend toward dynamic slotting.

In a fixed slotting system, a new item is assigned a fixed location as soon as it is received. Still, that marriage between SKU and slot is temporary for as long as it is appropriate, whether six months or a week. In a dynamic system, new and familiar SKUs are assigned to open pick locations as they become available. When integrated with the warehouse management system (WMS), dynamic slotting will inform replenishment to fill a new forward pick location before the previous one is depleted, and the SKU



Order Fulfillment Across Multiple Channels Can Be Complex. The Solution Doesn't Need to Be.

Handling direct-to-consumer and retail orders in one distribution center has never been easier. With a **3D-MATRIX Solution®** from SSI SCHAEFER, **every SKU inside your distribution center can be retrieved from its storage location and sent to any picking, packing or palletizing station** without a decrease in performance, reaching efficiencies never before imagined.

The cutting edge concept provided by the **3D-MATRIX Solution®** eliminates the need to ABC classify your inventory and opens up your warehouse from all sides utilizing the XYZ axes, allowing for highly-dynamic sequencing without bottlenecks in a single system. The patented solution offers maximum flexibility and future-oriented scalability.

Contact **SSI SCHAEFER** and find out just how easy we make it.

Multi-Channel Order Fulfillment Made Simple.

might never return to its original slot. The new location might be 5 feet to the left or five aisles over. The system might also make the old and new locations active simultaneously, or only temporarily activate the second location without permanently undoing the first.

“However, warehouse management systems with a single-bin limitation are probably the largest deal-breakers for good slotting,” La Londe says. “It’s not unusual to encounter someone who keeps 100% of an item’s stock in a primary bin, most often due to a limitation of technology.”

Even if software supports it, dynamic slotting has its downsides, Wulfraat warns. Forward reserve inventory placed above the pick slot will not necessarily move as the pick location does, which can potentially increase travel distance for replenishment labor. Dynamic systems might also call for a greater number of slots—as many as 1.25 times

The general focus of slotting is to make sure the last leg of warehouse activity—picking, staging and loading—is efficient. To prepare those functions, we looked at it from a weekly perspective based on new promotional schedules and fast-mover predictions.

—Jon Kuerschner, vice president of pre-sales for HighJump Software

those in a fixed environment—to ensure availability for new and incoming SKUs. “We have actually helped customers undo dynamic slotting in situations where it had gone bad,” Wulfraat says.

Whether an end-user had a bad experience or not, there is a lingering perception of slotting as a large process requiring partial or complete shutdown. “That has really changed dramatically,”

says Peter Schnorbach, senior director of product management for Manhattan Associates. He emphasizes consumers’ massive appetite for new products, which has driven retailers to introduce new items daily.

“Warehouses aren’t nearly as static as they used to be, and they need to get new products into active pick areas as fast as possible,” Schnorbach says. “There is much more tactical slotting, and daily adjustments are not uncommon. When an item comes in, it is slotted, delivered to a location and picked. It doesn’t happen the next day or two days later, it happens in seconds, right up front.”

In the past, a new item would need to spend some time in a random slot before enough sales data could be collected to make a decision about its optimal location. “That is no longer the case,” Schnorbach says. “There are all kinds of capabilities around forecasting, like looking at the activity of similar items or product families, and we can blend those properties to create reasonable forecasts.”

Where to slot the crystal ball

A slotting system with some amount of demand anticipation can have a dramatic impact on operational efficiency. Whenever possible, Wulfraat advises clients to do more than look over their shoulders to make slotting decisions based on a SKU’s velocity in the previous 12 weeks. “What you really want to do is get marketing data in advance,” he says. “If you’re expecting seven times the volume for two weeks, you can proactively re-slot the

SAVE TIME
WITH CREFORM AGVs.



Get lean by eliminating labor-intensive manned tuggers, forklifts or carts. Creform can help you automate your in-plant warehouse and production floor material handling. Our bolt-on AGV drives automate pipe & joint built carts and heavy-duty welded frame carts or just a few BST undercarriage AGV tuggers can mobilize an entire fleet of carts. From simple back-and-forth operations to plant-wide systems, Creform can do it all.

On time. Just in time. All the time. Saving time. Take a minute to give us a call.

CREFORM® MATERIAL HANDLING SYSTEMS
www.creform.com • 800-839-8823



item ahead of the sales lift—even if it's done with manual notification.”

However, as with single-bin limitations, many existing business systems are simply not set up to combine relevant data into valuable forecasting tools. Basmajian says that less than 10% of Optricity's customers have forward-looking capabilities, and most of them are overseas.

“For the rest, there's typically a disconnect between buyers, what they buy and outbound demand,” he says. “They're motivated and incented differently than shipping people.”

Looking at order history is easy, because the WMS knows what it did last week or month. According to Kozenski, the hard part is an accurate forecast the WMS can digest. “It has to come from merchandising or the ordering system, and if there's no interface for that the WMS has no idea what is coming and has to wait until orders come down,” he says. “Maybe you do some quick re-slotting at that time, but you must not interfere with pickers. Many customers are not chasing this aggressively enough, and those connections between systems are not being built.”

Even without those bridges, slotting can be a powerful tool for modeling future activity. What if a facility adds 1,000 items, or volume goes up 20%, or another company is acquired?

Jon Kuerschner, vice president of pre-sales for HighJump Software, has prior experience as an end-user. Having looked at slotting from the eyes of vendor and customer, he has come to value slotting as an essential planning tool.

“The general focus of slotting is to make sure the last leg of warehouse activity—picking, staging and loading—is efficient,” Kuerschner says. “To prepare those functions, we looked at it from a weekly perspective based on new promotional schedules and fast-mover predictions. Then we reviewed slotting quarterly based on how products moved, whether e-commerce, in-store or drop-ships.”

Kuerschner has witnessed the dom-

ino effect each relocation can create, the chain of item movements just to free up space to slot a fast-mover in the right place. That's where an economic modeling function helps. “At pick location X with Y volume, it would cost this much over a month,” he explains. “If we move it, the costs change. If there's a big enough delta between the two and the moves are not too onerous, you can make that call.”

Basmajian offers the example of a customer who used the modeling capabilities of a slotting tool to inform the wider supply chain. On the first simulation run, the customer focused on nothing but efficiencies inside the four walls. The goals and constraints minimized selector travel and built good, stable outbound pallets. They could see the savings before they committed and saw a six-figure benefit.

“Then, before he pulled the trigger, he put on his team-player hat and

tried a store-friendly model. There was far less benefit for him, but big savings at retail stores,” Basmajian recalls. “In either instance you have to change the labor plan. If you don't, first you have selectors finish an hour early one day, 45 minutes the next, and by the end of the week they have learned to manage the workload across the shift. The lesson is that if you improve slotting optimization, make sure you manage related resources.” □

Companies mentioned in this article

- DMLogic
- HighJump Software
- JDA Software
- Manhattan Associates
- MWPVL International
- Optricity
- PathGuide Technologies



SUCCESS IS EASIER WHEN YOU HAVE A SUPPLIER THAT

- Understands your business and your customers.
- Helps keep your customers satisfied...and loyal.
- Has the products you need to grow your customer base.
- Will help increase your bottom line profit.

That supplier is **Thombert**, your **SINGLE SOURCE SOLUTION** for less frustration and more profit. Give us a call, kick back, and rest easy. It's that simple!

316 E 7th Street N | 800-433-3572
Newton, IA, 50208 | thombert.com

THOMBERT
The Longest Ride

By **Josh Bond**,
Senior Editor

Dock equipment enhances safety, security and cold chain integrity



Food manufacturer surpasses Food Safety Modernization Act guidelines in new facility.

The Sartori Co. is a fourth-generation, family-owned and operated cheese manufacturing company located in Plymouth, Wis. When designing its new facility, the company selected an assortment of dock equipment to ensure compliance with the Food Safety Modernization Act (FSMA).

FSMA identifies docks as a high-risk zone for food defense and facility security. The design process for controlling the dock environment and cold chain began on the outside of the 100,000-square-foot building. Automatic vehicle restraints (Rite-Hite, ritehite.com) wrap around the trailer's rear impact guard to increase safety, reduce contamination and prevent theft.

Once a trailer is secure at the loading dock, a vertical dock leveler helps maintain environmental control and cold chain integrity by allowing trailer doors to open inside the facility. The seal is broken inside

the building by Sartori staff, as opposed to outside by the truck driver, increasing security and eliminating exposure to precipitation, wind or dust. The tight seal helps keep the dock at an ideal 34°F to 36°F.

Inside the building, high-speed doors further improve cold chain integrity by separating the de-boxing and de-palletizing areas from the processing room. The doors open and close at 65 inches per second to minimize temperature change and contamination between the two rooms.

"The vertical leveler/drive-through application is great for food processing facilities, as is the other dock equipment," says Sara Adams, manager of manufacturing excellence at Sartori. "Regulatory requirements and our customers expect us to maintain the cold chain. With the system we now have in place, there are no temperature fluctuations inside the dock area regardless of the weather outside." □

CLARK

RAISING HOPE



CLARK employees, dealers and customers take pride in supporting our communities. Over the past nine years this partnership has donated nearly \$300,000 to the **Susan G. Komen Race for the Cure**



2015 Raising *Hope* Champions

- **All Lift Service Company Inc.**
Willoughby/Cleveland, OH
- **Capital Equipment & Handling, Inc.**
Hartland, WI
- **Equipment Depot**
Mechanicsburg, PA
- **Forklifts of Minnesota, Inc.**
Bloomington, MN
- **Material Handling Inc.**
Dalton, GA
- **Tri-Lift NC, Inc.**
Greensboro, NC
- **B & H Industrial Service, Inc.**
Springfield, MO
- **Cardinal Carryor, Inc.**
Louisville, KY
- **Equipment Depot**
Houston, TX
- **Harlan Global Manufacturing**
Kansas City, KS
- **Raymond of New Jersey, LLC.**
Union, NJ
- **Valley Industrial Trucks, Inc.**
Youngstown, OH
- **Buffalo Lift Trucks, Inc.**
Depew, NY
- **Central Ohio Forklifts**
Columbus, OH
- **FMH Material Handling Solutions**
Denver, CO
- **Lift Truck Sales & Service, Inc.**
Kansas City, MO
- **Sooner Lift Inc.**
Oklahoma City, OK



For all the latest going on at CLARK Forklifts, like us at **CLARKMHCNA**

Learn more about **CLARK** Philanthropy at clarkmhc.com/partnerships

By Josh Bond,
Senior Editor

Bar code scanning system adds traceability, subtracts manual data entry



Customized mobile software helps integrate production, shipping and other business functions.

Azteca Foods is a family-owned and operated leader in the Mexican foods industry, serving consumers and manufacturing partners globally. The company is headquartered in Chicago, where it operates a 100,000-square-foot manufacturing facility employing more than 135 people. Seeking a way to track pallets of goods moving through the warehouse, the company deployed a bar code scanning system.

Azteca wanted to improve traceability and eliminate manual data entry processes requiring operators to write down what they produced and what they received to balance finished goods data at the end of a shift. The new bar code scanning system (Barcoding Inc., barcoding.com) consists of handheld computers (Zebra, zebra.com), a customized mobile software application, an internally hosted Web service and network extenders for maximum wireless coverage inside the facility.

Now when pallets come off the line, warehouse

operators scan a bar code. The application queries the Web service for information about the shift, the line, the product and the number of cases on the pallet. Using this data, the application generates a unique pallet identification number, stores the information and transfers it to Azteca's back-end system.

"This customized solution will help drive our efficiency, accuracy and connectivity well into the future," says Nannette Zander, vice president of information technology for Azteca Foods.

The company has achieved full traceability of goods moving into its finished goods warehouse. Managers can run reports in seconds to make sure production data is balanced on a shift-by-shift basis. The company plans to expand the solution by introducing printers that create pallet tickets to track product in the shipping process. Azteca is also planning to connect its database with its enterprise resource planning system to integrate production information with other business functions. □

**You have the very last roll of
preprinted barcode LPN labels in your hand,
and pallets are stacking up in shipping.**

Worried? You should be.

**The solution?
Worry-free
Make & Hold program
from ID Label.**



Advantages:

- In-stock preprinted barcode labels inventoried at ID Label's warehouse.
- Place an initial order for a quarterly quantity and then it's as easy as picking up the phone to request case or pallet load releases.
- Larger press runs equate to you saving money!

Benefits:

- You keep your job and you only pay for what we release from inventory.
- You can start relaxing and can now ship those pallets on time.



Positive feedback...Every time

salesmmh@idlabelinc.com | 800.541.8506 x108

www.idlabelinc.com



WAREHOUSE
SIGNS



RACK
LABELS



PREPRINTED LPN
LABELS



NATIONAL INSTALLATION
SERVICES

The
evolution
of
supply chain

**collaboration
software**

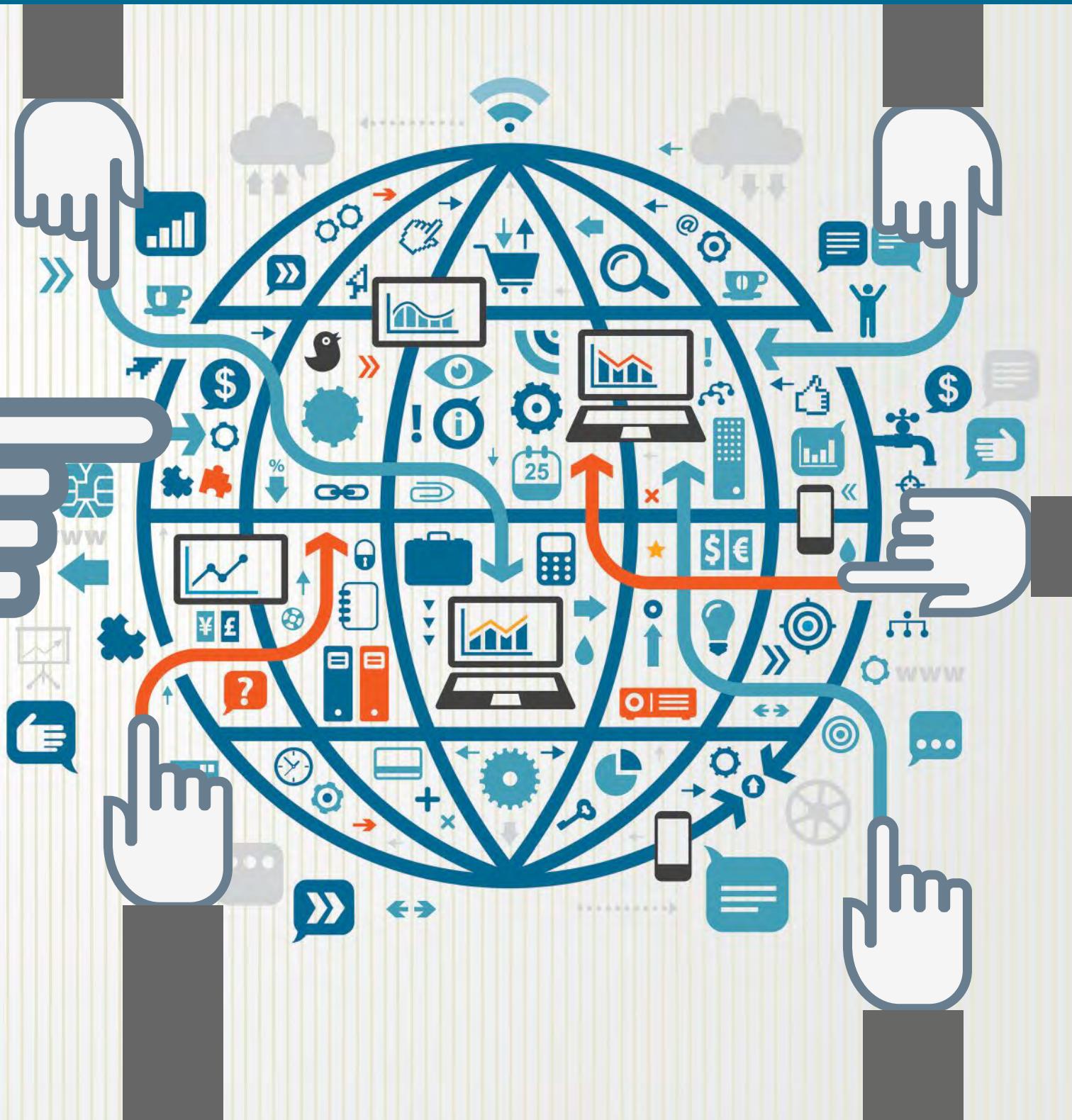


Are you on the same page, in real time, with your trading partners? That's the promise of today's supply chain collaboration software.

By **Bridget McCrea**, Contributing Editor

A fly on the wall of virtually every business meeting and in any corner of the corporate world right now would be hard pressed not to hear the word “collaboration” mentioned at least once. Defined as the action of working with someone to produce or create something, collaboration has floated to the top of supply chain managers’ minds in recent years thanks to an increased focus on how “working together” produces better results than trying to get tasks accomplished with fragmented, siloed systems.

Across the supply chain, collaborative software helps bring formerly disparate and disconnected entities onto the same page. With the emergence of cloud computing making



this goal even easier, vendors are developing solutions that help optimize logistics and procurement, enable the exchange of data, and encourage collaboration among business partners. With the economy becoming more and more global every day, these innovations support a world where manufacturers, distributors, suppliers and retailers can all be on the same page, in real time, and at any moment in time.

Ellen Malfliet, marketing and communications manager at PearlChain in Antwerp, Belgium, says new innovations within the collaborative supply chain space, and companies' willingness to test out and adopt these systems, is driven in part by changing customer demands. "Everyone within the value chain is focused on the customer right now," says Malfliet. Take automobile manufacturing, for example, where raw materials suppliers, manufacturers, distributors and dealers must all work together in a collaborative environment to turn out a viable end product.

"Across the automobile supply chain, everyone wants to ensure that they are taking the correct steps to fulfill their customers' needs and that they are doing this in such an order/sequence that they can achieve operational excellence internally," Malfliet explains. "In the end, the successful customer experience translates into success for all parties across the supply chain—not just those that are actually facing the customer. Everyone wins."

But what happens when companies don't communicate well with all of the other players within the value chain? Those firms are left to rely on forecasts and historical views that don't always paint a forward-looking picture.

"When you use forecasts, you're forced to determine upcoming demand based on prior demand, or maybe even the weather—depending on the product or service that you're creating," says Malfliet. "The good news is that when you have the necessary data from other factions further up the chain—who already know the real demand, and who share it with you—that's where collaboration comes into play."

In this article, we explore the evolution of supply chain collaboration software, show how it's being used in the corporate world, and discuss the inroads that suppliers are making in their mission to come up with stream-

lined, collaborative platforms that help companies interact effectively across their end-to-end supply chains.

15 years in the making

David Miller, chief security officer at Detroit-based Covisint, remembers the exact point when GM, Ford and Daimler Chrysler decided that they'd had enough of trying to manage three very similar supply chains. The year was 2000, and the three large auto manufacturers were duplicating their efforts across their supplier networks, but lacked any ability to collaborate among OEMs for functions like inventory management. Miller, who worked for GM at the time, recalls that the Big Three were using anywhere from three to five different inventory management systems, RFP systems, bidding systems and purchasing processes.

"Every one of those systems was being duplicated numerous times," says Miller. Fifteen years ago, the three automakers came together to create Covisint—a platform that formed a single place in the cloud

where suppliers would interact with their customers regardless of whether they were working with GM, Ford or Daimler Chrysler.

"We gave them a single portal to work from, even though all of the applications were separate," recalls Miller. Concurrently, the automakers built out a standard EDI messaging platform that enabled easy information exchange.

Fast forward to 2015, and Miller is seeing more and more applications moving into the cloud and enabling solid supply chain collaboration and other activities. He points to consumer-focused financial applications like Mint, which allow users to aggregate account information from various entities on a single platform, as potential models for even more robust supply chain collaboration.

"I may have three credit cards from three different companies, and while they aren't sharing information among each other, Mint aggregates the data for me," says Miller. "The same approach can be used to track critical information like inventory quality, failure rates and parts per million (PPM) defect rates on a single dashboard. This will help companies more quickly pick up on and address problems, make engineering changes, and take other measures."



Good supply chain collaboration is about building communication links and connections among the trading network's various parties.



Let Dehnco Help You Evaluate and Integrate Workstations,
Supply Storage and Equipment Needs with Your Automation,
Technology and Material Handling Systems
... AT A PRICE YOU CAN AFFORD



Pack Bench Systems®

Organization Creates Efficiency ... Efficiency Promotes Productivity

Dehnco offers a simple **4** step evaluation process that:

- Promotes Ergonomics • Creates Efficiency • Increases Productivity

STEP : 1

Evaluating
Flow

STEP : 2

Identifying the
Process

STEP : 3

Integrating
Supplies and
Equipment
Required

STEP : 4

Integrate
Work Area Design
with the Process

Contact Us:
Call: 847-382-1579
www.dehnco.com



SCAN TO SEE
NEW COMPONENTS



300 Lageschulte St
P.O. Box 866
Barrington, IL 60010
Ph: 847-382-1579 • Fax: 847-382-1615

Let Us HELP You Define and Resolve These Issues
• SPACE • STORAGE • HANDLING/DESIGN • ERGONOMICS • WORKFLOW • SPACE

Data is the new oil

Calling data “the oil of the 21st century,” Malfliet says supply chain collaboration works optimally when it’s managed in real time and when all interested parties

are on the same page. At the heart of each of those relationships is a data-sharing process made easier by technology, software, the cloud, and even the Internet of Things (IoT). “These tools allow every individual

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	gtnexus.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

The market for supply chain management software, maintenance, and services continued its growth in 2014, generating \$9.924 billion in 2014, including applications for procurement software. That represented a nearly 10% increase over 2013 revenues, according to Chad Eschinger, vice president, supply chain, with Gartner. Looking forward, Gartner is predicting a compound annual growth rate (CAGR) for SCM software including procurement of 10% for the next 5 years, reaching \$16.3 billion in 2019. What attributes to that growth? “The industry is in a replacement cycle, but we’re also seeing supply chain capabilities spreading into places like retail stores,” says Eschinger. “The goal is improved collaboration across a broader platform, which can drive much higher levels of efficiency.”

Selective Pallet Rack



Pallet Flow

Wide Span

Drive-In / Drive-Thru



WAREHOUSE
RACKING
SOLUTIONS

interlake



www.interlakemecalux.com

(877) 632.2589

part to be tracked online, including materials that are in transit, those stored in the warehouse, and those that the customer is using,” says Malfliet. “At the same time, every product or service is becoming more and more defined, all with an eye toward creating the right customer experience.” As this trend continues to evolve, she says it just “makes more sense to create flexible networks that can support the trend and that can scale and grow accordingly.”

Gary Barraco, senior director of supply chain solutions with Amber Road in East Rutherford, N.J., says good supply chain collaboration is about building communication links and connections among the trading network’s various parties. Retailers who rely heavily on a network of suppliers to provide the goods and services that their end users want and need tend to reap the biggest rewards from solid collaboration.

“Retailers require that collaborative and open conversation as well as visibility into their suppliers’ activities to achieve goals like shorter cycle times, perfect orders, and minimal inventory stockouts,” says Barraco.

Suppliers also gain from the collaboration, says Barraco, particularly when their retailer-customers use their online portals to provide earlier-than-normal visibility into upcoming plans and forecasts. Pointing to one large shoe manufacturer as an example, Barraco says nine years ago the company was e-mailing and faxing purchase orders on a one-by-one basis before implementing its collaborative platform.

The process took three staff members and about three weeks (including order acknowledgement and confirmation) in advance of the firm’s busy season. “Now it takes one person three days to issue and confirm all of the POs,” says Barraco. “That’s a pretty significant savings of time and human resources, all due to the company’s use of collaborative supply chain software.”

Creating a free-flow system

“One of the biggest problems that exists in the supply chain today is the fact that most tools and processes are built up around optimizing rigid hierarchies,” says Rob Cheng, head of growth at Elementum. “They are pre-defined, pre-planned taxonomies of how the world works.” Such rigidity just doesn’t work very well in today’s fast-paced business world, says Cheng, where everything is moving too quickly for those hierarchies to keep up.

“When we look at the problems that our customers are

having in this area,” says Cheng, “a lot of them revolve around these issues and the fact that no one in the world—no matter how smart he or she is—can predict in advance what’s to come.”

The good news is that through solid information sharing and participation from the various players within the supply chain, foresight can begin to come into focus.

“The key is to create a system where information can flow more freely to the people who need it, and then allow everyone on the front lines to essentially ‘self-subscribe’ to the information stream,” says Cheng. “Only then will they be able to follow the relevant information—routes, ports, transportation options, carriers, shipments, supplies and so forth—and enable teams to be more self-organizing and act more real time on information that’s relevant to their jobs.”

What’s to come?

All of the experts interviewed for this article expect technology-based supply chain collaboration to continue to evolve and grow over the coming years. At the same time, automation will continue to gain in popularity, says

Malfliet, as the use of drones in the warehouse for picking is projected to increase, and as the need to reduce the amount of physical labor and free people up to do more important tasks continues. Using software, for example, companies can now more easily match up the best supplier for every customer and/or order, based on overarching agreements established with both parties. “That frees up time for planners and operational employees,” says Malfliet, “and allows companies to more closely examine the strategic value of these workers.”

To companies looking to get the most out of their supply chain platforms, Malfliet cautions that the only way to effectively manage collaboration across the supply chain is by employing an end-to-end strategy. All of the players in the value chain need to be connected to one another, she says, and with no exceptions. And remember that the bigger the supply chain is, the more benefit you will get out of solid collaboration enabled by today’s advanced software programs.

Finally, everyone has to have access to the same data and it has to be in real time. “Sure everyone has their own little piece or ‘corner’ of the overall scenario to manage,” Malfliet says, “but in the end each has to have a global overview to be able to contribute and collaborate effectively. □



To companies looking to get the most out of their supply chain platforms, Malfliet cautions that the only way to effectively manage collaboration across the supply chain is by employing an end-to-end strategy.

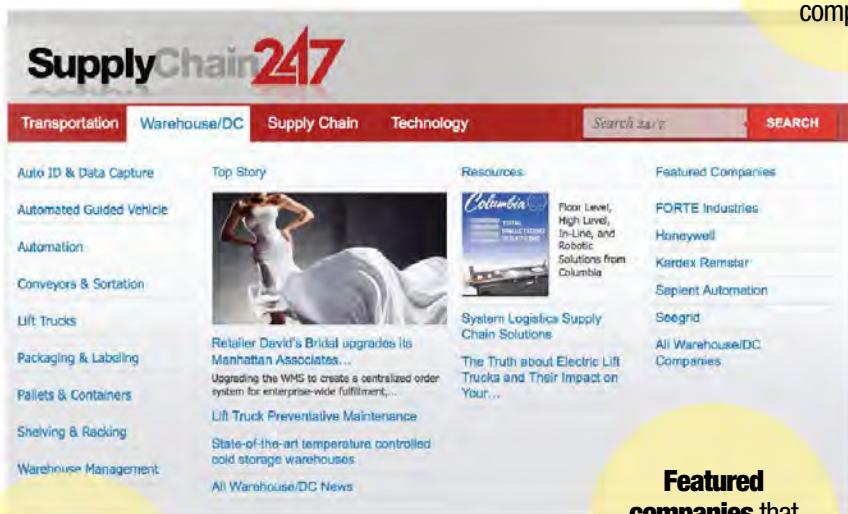
Find everything you need when researching companies, trends, and industries.

Supply Chain 24/7 is the ultimate online business resource for transportation, distribution, logistics and supply chain professionals.

Your *best* business resource for:

- News
- Best practices
- Trends
- Case studies
- White papers
- Webcasts
- Research
- Special reports
- Blogs

and *much much* more!



Search engine
can search across
content elements
and by specific
companies

Trending news
and features

**Featured
companies** that
are relevant to the
specific topic

Visit **supplychain247.com**.
Begin your experience today.

Customize robust trolley crane for heavy-duty lifting applications

With rugged construction and multiple trolley configurations, Uniton cranes can be custom-tailored for use in heavy-duty lifting and process industries. Standard features include fabricated box end trucks with 90-degree MCB-type bearing housings that are easy to replace and promote long life, and two-point drum suspension to inhibit deflections of the rope drum that can cause misalignment in the connection between the drum and gearbox. Inverter controls come standard in all motions (bridge, trolley and hoist). Optionally, an extended speed range plus (ESR+) feature allows for higher lifting and lowering speeds when less than rated load capacities are handled. Configurable with a range of load



options, hoisting speeds, lift heights, trolley gauges, frame sizes and weights, the cranes handle loads from 6.3 to 160 tons with a single trolley, and up to 320 tons with two trolleys. **Konecranes, 937-525-5533, www.konecranesusa.com.**

Lift and transport drums with automatic below-hook attachment

The new BHDL-3A-HD fully automatic and mechanical below-hook drum attachment lifts 55-gallon (210 liter) steel and plastic drums—in diameters of 21 to 23 inches—from overhead. Ideal for facilitating placement to and from containment devices, pallets, scales or other step-to-step elevations, the device maintains the drum in a completely vertical position during lift, lower and transport.



Three radial arms conform to the drum body, engaging at the underside of the drum chime. This three-point connection ensures the drum's integrity during movement, while an intuitive lock engagement secures the radial arms in their locked position until final placement. **Liftomatic Material Handling, 800-837-6540, www.liftomatic.com.**

Pendant pushbutton stations are ergonomic, lightweight

Control cranes and hoists with a new series of pendant pushbutton stations. The SBN has been engineered with additional flexibility over the supplier's previous model and features lightweight, ergonomic construction to reduce operator effort and fatigue. Most models of the slim-line pendant weigh less than 2 pounds and rest comfortably in the palm of an operator's hand. Additionally, switches can be accessed and replaced with the removal of the back of the enclosure. **Magnetek, 800-288-8178, www.magnetekmh.com.**



Move, tilt and dispense drums and pails below the hook

A full line of below-hook drum and pail carriers, tilters and dispensers attach to a hoist or crane to lift, move or pour out contents. Offered in 12 different models



powered by air or AC electric, the units can be used to move, dispense methodically, control-pour and rotate capacities up to 1,500 pounds. All models are factory load tested prior to shipping per American National Standard ASME B30.20 and a load test certificate is enclosed with each unit. **Morse Manufacturing, 315-437-8475, www.morsedrum.com.**

Expanded rigging line now includes heavy-duty crane hooks

Offered in single- and double-hook configurations with capacities up to 1,250 metric tons, a new line of rigging attachments includes standard forged hooks, hooks with extended shafts, custom hooks, complete hook suspensions and high-quality machined and un-machined products for a variety of applications. Manufactured through a combination of in-house open-die and drop forging, machining and tool-making processes, the hooks are produced quickly and efficiently. The drop forging process can create shank hooks up to size number 63 and double (ramshorn) hooks up to size number 125. Through open-die forging, shank and ramshorn hooks can be sized up to number 400 specs. **Columbus McKinnon, 731-614-3728, www.cmworks.com.**



Transport garments on hangers with power-and-free system

A garment on hanger overhead rail system moves apparel in manufacturing and warehouse facilities using light duty, inexpensive power-and-free conveyors. Maneuvering trolleys filled with hanging garments over great distances, through changing elevations and across long complex paths, the system permits



separation of the trolleys from the power chain onto free (non-powered) lines. This allows trolleys to be stopped, switched or diverted to other paths, either powered or non-powered. Custom

configured for each installation, systems can include multiple entry points; automatic or manual routing; non-powered areas for inspection, tagging/ticketing or other value-added processes; vertical inclines and declines; accumulation and unit sortation; large capacity baskets for handling of flat goods; and multiple discharge points. For automatic control and routing to various destinations, the system can be integrated with readers for bar codes, chips and magnetic identification. **W&H Systems**, 201-635-3493, www.whsystems.com.

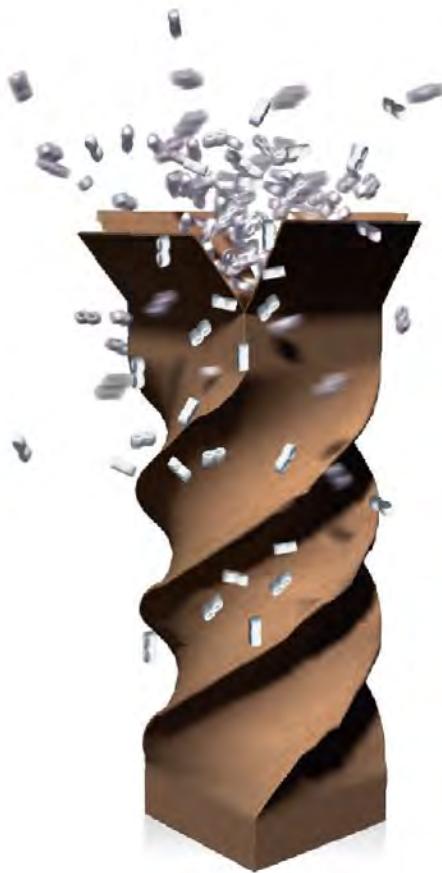
Crane steadies loads more quickly for shorter cycle times

Based on V-shaped girders, the new Demag V-type crane's low-oscillation construction with tapered diaphragm joints improves precision, flexibility and accuracy. The joints accommodate pressure and tensile

forces more effectively to reduce resonant frequency by 30%. This allows for loads to be steadied more quickly for shorter cycle times and increased load handling rates. Further,



the crane is 17% lighter than previous models due to a weight-optimization with a reduction in non-load-bearing surfaces. The crane is controlled by the DRC D3 radio control system with handheld transmitters and receivers that meet the requirements of the future EN 300 328 V 1.8.1 radio standard. **Terex MHPS**, 440-248-2400, www.demag-us.com.



SPIRAL CONVEYING. STRAIGHT UP.

As the market leader in spiral conveyors in the logistic industry we think of solutions for handling cases & SKU's. It's what we do. At AmbaFlex it's not just about building the right equipment, it's about developing a special solution for you. Here's to spiral conveying.

Spiral elevators for goods-to-man systems, picking modules and sorting systems.

**AmbaFlex**
SCIENCE IN SPIRALS

BY AMBAFLEX | WWW.AMBAFLEX.COM

Pneumatic hoists reach speeds of 100+ feet per minute

The Columbia HS line of pneumatic, radial piston-powered hoists includes models with 3,500-, 8,800- and 16,500-pound line pull ratings. Capable of reaching hoisting speeds in excess of 100 feet per minute, the units feature heavy-duty cast construction and precision planetary reductions.

All moving parts are internally sealed to maintain full lubrication with minimal service needs. Rated to lift loads vertically, hoists use an automatic spring-set, pneumatically released brake. When used in conjunction

with an optional counter-balance valve, operators can move loads quickly and smoothly with precise control. They can be customized with a variety of options including control valves, band brakes, and ratchet and pawl assemblies. Allied Power Products, 503-626-0654, www.alliedpower.com.



Portable gantry crane in steel or aluminum

Bear Claw gantry cranes for overhead lifting and positioning of heavy materials without a fork truck or a hoist are manufactured in steel and aluminum. Portable, the cranes travel on four, 8-inch swivel casters or on V-groove casters with track. Steel models are height adjustable in 6-inch increments and handle up loads to 10,000 pounds. The aluminum series' capacity is 6,000 pounds and features pinned corner connections for quick set up or take down by a single person. Beacon Industries, 800-454-7159, www.beacontechnology.com.



Free resource for crane configuration available online

Accessible for free after registration at the supplier's Web site, a new online crane configuration resource has launched. Information provided includes unlimited access to architectural drawings and loading data, crane specs, downloadable forms and an online configurator tool. Resources and specifications are offered in both .doc and .pdf formats to simplify the engineering of an application's overhead lifting or safety solution. Gorbels, 844-268-7055, www.gorbels.com.

Pipe tong lifters engage load automatically for single-operator handling

Equipped with an integrated Autolatch function, AR12A pipe tong lifters automatically engage or disengage a load of pipe or other cylinder-shaped items without manual assistance. This eliminates the need for a two person lifting operation, as one skilled crane operator can do the work alone. Stocked tongs range in sizes from 3.5- to 14-inch diameters and handle capacities up to 3,400 pounds. To accommodate other load sizes, shapes and weights, custom lifting tongs can be engineered. Tandemloc, 252-447-7155, www.tandemloc.com.



ULINE

OVER 2,000 LABEL PRODUCTS IN STOCK

ORDER BY 6 PM FOR SAME DAY SHIPPING

COMPLETE CATALOG
1-800-295-5510
uline.com

PRODUCT Showcase

Deploy air-operated hoists for storage tank cleaning

With precise load placement controlled by hand pendants, a line of air-operated hoists provides an effective way to clean storage and transport tanks. The hoists lift, support and accurately position nozzle-equipped injector heads used to clean by dispensing hot/cold water, steam or solvents at high pressures. Powered by compressed air and Ex-rated for deployment in areas where volatile liquids or chemicals are present, the hoists can be safely used in these operations. The hoists also feature increased spark protection for use in potentially combustible or explosive atmospheres. Two models are offered: the Profi TI series hoists that operate at an air pressure of 4 to 6 bar and are suitable for loads from 550 pounds to 100 metric tons; and the Mini series for lighter duty applications, operating at 6 bar air pressure and carrying loads up to 2,160 pounds. JD Neuhaus, 888-638-4287, www.jdngroup.com.



Maintenance-free caster keeps grease in, contaminants out

Incorporated into the maintenance-free, heavy-duty Spinfinity swivel kingpinless caster's construction is special CNC-machining to host a large internal seal. The seal—made from nitrile butadiene rubber (NBR)—is completely enclosed inside the swivel assembly, keeping grease in and contaminants out. Three types are offered: the ZFWH series features 2-inch wide wheels, a 4 x 5-inch mounting plate and holds up to 2,500 pounds per caster; the ZFHS series with 2-inch wide wheels and 4.5 x 6.25-inch mounting plate carries up to 3,000 pounds per caster; and the ZFFM series offers 3-inch wide wheels, a 4.5 x 6.25-inch mounting plate and handles up to 3,200 pounds per caster. Finished in red, the casters may be customized with a choice of 10 different wheels and in-stock swivel lock and brake options. Hamilton Caster & Mfg., 800-733-7655, www.hamiltoncaster.com.



Safe, efficient plate handling with lifting magnets

Using patented, electrically controlled permanent lifting magnets, the Series 918 plate handling system works with a double hook mobile crane for lifting and moving metal plates. Each of the magnet crossarms can be manually repositioned on the low headroom intermediate beam to better support the load. Prior to lifting, an integrated controller device confirms the magnets have attached to the load. The controller—equipped with radio remote on/off controls and a hard-wired pendant—selectively controls each pair of magnets by row. Capable of providing approximately 400 lifts between recharging, the system is powered by a 24-volt DC battery. Permador Industries, 800-392-0146, www.permador.com



ADVANCE MEZZANINE LIFTS®

RIDER LIFTS FOR MEZZANINES & UPPER FLOORS

- ▶ INCREASED UTILITY
- ▶ SAFER LOADING & UNLOADING
- ▶ FASTER LOADING & UNLOADING
- ▶ COST EFFECTIVE



WHITE PAPER
Two (2) VIDEOS AVAILABLE AT
WWW.ADVANCELIFTS.COM



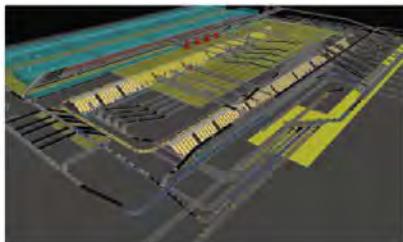
ISO 9001:2008
Certified



1-800-843-3625

Enhanced warehouse execution software module released

The Route Manager software module, a foundational component of the supplier's warehouse execution system (WES) has been enhanced with simplified configurability, a new user interface, and support for multiple operating systems and databases. Working in tandem with enterprise software systems and machine controls, the software routes products through automated systems, making real-time adjustments to avoid bottlenecks and transport



product in the most efficient manner possible. Operators can now make routing adjustments by changing method, decision and destination settings without using programmer resources for coding modifications. Web-based, the software supports on-demand routing decisions and intelligent zone routing with forced sequential stops, adaptive location stops and mirrored destinations, and a variety of sortation methods. **Intelligrated**, 877-315-3400, www.intelligrated.com.

Reduce DIM weight, order fulfillment costs with cartonization software

A new software product combines cartonization logic and in-motion dimensional pick verification to lean up the picking and packing process. The software's advanced algorithm determines the optimal shipping carton size to maximize packing efficiency and lower shipping costs. It can be used as an audit tool to detect discrepancies in planned vs. actual dimensions on outbound shipments. Before order release, the system analyzes order data and calculates the optimal shipping carton size before picking, allowing associates to place items directly into the final box rather than an interim tote. For operations shipping a high percentage of full cases, the software's learn mode can capture and learn full case cube and weight, eliminating manual collection of DIM weight data. **Numina Group**, 630-343-2600, www.numinagroup.com.

Reduce air space in order fulfillment packaging

Ideal for operations packing 300 to 2,000 boxes per day, the e-Cube void reduction packaging system supports order fulfillment processes. After products are picked into the cardboard shipping case, the machine automatically measures their height. It then rips the corners of the box down to the corresponding measurement, folds all four flaps over and seals the box by gluing the upper flaps. By right-sizing the shipping box to match its contents, the system saves on transport and last mile delivery costs, as well as eliminates the need for fill material. **Sealed Air**, 980-221-3235, www.sealedair.com.

Organize pigeonhole bins and steel shelving with label holder strip

With a self-adhesive backing for easy installation, the new EZ-Edge label holder strip is engineered for use with pigeonhole bin units and steel shelving. The strip incorporates a level edge bottom guide to ensure the holders are placed evenly on the surface. Made of heavy-duty, UV-treated PVC



plastic, the product has a black background and clear front window. Bar code compatible for clear, visible identification, the label holder may be specified in one of two lengths and can be trimmed as needed. **Aigner Label Holder**, 800-242-3919, www.aignerlabelholder.com.

OVER 100 MODELS
The Specialist in Drum Handling
(315) 437-8475

MORSE
www.MorseDrum.com/mmh

PRODUCT Showcase

Rugged mobile computer offers extended-range scanning

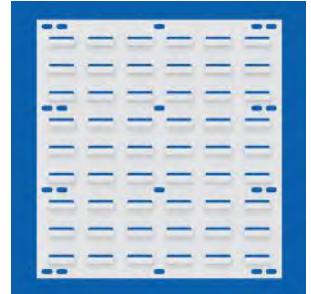
The new XG3-ER rugged mobile computer offers powerful long-range bar code scanning and is one of only a few devices available with Intermec's EX25 near/far imager. The device incorporates breakthrough auto-focus technology that results in bar code reading range that is 30% greater than competitive scanners. With the flexibility to omni-directionally read virtually any kind of 1D and 2D bar code from 6 inches out to more than 50 feet, the XG3-ER provides accurate, motion-tolerant scanning when lighting conditions are dim or the bar codes are damaged, obscured or placed on high shelving. It can survive multiple 6-foot drops to concrete on all sides across a spectrum of temperatures and is sealed to IP65 standards. A standard 5200mAh hot-swappable Li-ion battery ensures uninterrupted operation throughout the workday. **Janam Technologies, 877-526-2699, www.janam.com.**



that quickly align and lock the column into the bottom teardrop position creating a solid four-point connection. A choice of galvanized and powder-coated wire decking with drop-in installation is also offered. **Next Level Storage Solutions, 800-230-8846, www.nextlevelstorage.com.**

Line of louvered, bin hanging panels expands with four new models

With the introduction of new, textured white models, a line of louvered hanging system panels has been expanded. The panels come in four sizes—18 x 61 inches, 36 x 61 inches, 18 x 19 inches and 35 x 19 inches—and support the supplier's AkroBin, InSight and Universal plastic hanging bins. Also offered in gray and beige powder-coated finish, the panels are made of heavy-duty, 16-gauge, cold-rolled steel for strength and durability. **Akro-Mils, 800-253-2467, www.akro-mils.com.**



Minimize box inventory with on-demand corrugated packaging

An on-demand corrugated packaging system is ideal for protecting products during shipment without having to stock a variety of box sizes in inventory. The machinery minimizes the amount of void fill required to protect items, including large products such as furniture, by creating a right-sized box when needed. In addition to reducing corrugated costs, the system also minimizes clutter and reduces shipping damage. **PackSize, 801-944-4814, www.packsize.com.**



Pallet rack incorporates fully bolted connections for enhanced strength

Featuring fully bolted connections for greater strength than welded joints, the FlexRack pallet rack system comes in multiple configuration options to accommodate multi-use storage environments. The racking includes 3 x 3-inch columns with teardrop punching on 2-inch centers, making it compatible with 85% of other rack brands. Frames up to 47 feet may be specified in a variety of standard and custom colors, while solid, tubular-construction beams are equipped with a 1.625-inch step and universal 3&4 pin connector. For ease of installation, the racking's no-weld base plate uses secure-lock dimples

Are your wooden pallet prices through the roof?

TRY LITCO'S INTERNATIONAL SHIPPING PALLETS

- **Mold and Pest Free**— Clean and dry
- **Small Sizes**—24"x40" and Half Euro as low as \$3.95
- **Large Sizes**—Domestic and Euro as low as \$6.75

48"x40"
AS LOW AS
\$6.75
EACH



**Meets
IPPC-ISPM 15
"Heat Treated"
Requirements**



Visit Litco.com for "Buy it Now", Bulk Buy RFQ and a Free Sample

855.296.2891

 **LITCO International, Inc.**
Export and Domestic Pallets
Load Securement Solutions
Molded Core Plugs

Carry on.

All Litco products are designed to **Carry** your products safely **on** through the most demanding supply chains

Production cart securely handles precision components

A custom-constructed mobile cart supports handling of precision components in automotive manufacturing operations. Built with a series of plastic-coated steel pipes, joints and accessories, the cart is lightweight yet strong, maneuverable and can easily be modified when needs change. Each cart contains two



shelves with four openings per level. Open slots at each end make loading/unloading easy and efficient. At each opening, a 0.5-inch plastic shelf supports the parts on both sides as they hang. Measuring 36 x 36 x 50 inches,

the unit handles up to 350 pounds and rolls on four, 4-inch diameter locking swivel casters for easy positioning. **Creform Corp.**, 800-839-8823, www.creform.com.

End-of-line case packing and palletizing system based on FANUC robot

A new, complete end-of-line case packing and palletizing system deploys a single FANUC M710iC robot. The ErgoPackPal requires a minimal footprint and is engineered for low to



medium throughput applications. Ideal for situations where a worker is packing and palletizing at a single station over multiple shifts, the dual-function robot provides flexibility over permanent installations. Customizable with

special end-of-arm tooling that can interface with a variety of product types, the system may alternately be outfitted with a high-speed, compact FANUC R1000/R2000 model for jobs with a higher required weight limit. **Combi Packaging Systems**, 800-521-9072, www.combi.com; **Motion Controls Robotics**, 419-334-5886, www.motioncontrolsrobotics.com.

Productivity push.

With Power Pusher® one person can effortlessly and safely move rolling loads from 500 to 50,000 lbs.

The original Power Pusher pays for itself with improved productivity, reducing manpower and downtime, while protecting worker safety. Powerful, compact and rechargeable, Power Pusher replaces forklifts and tractors with a flexible and affordable solution for your biggest material handling challenges. See it in action at powerpusher.com

Over a dozen Power Pusher attachments are available to meet your load handling application

Division of NuStar, Inc
www.PowerPusher.com • 800-800-9274

Mast-style platform lift is compact and maneuverable

Ideal for stockrooms, assembly areas, retail stores, food manufacturing and pharmaceutical facilities, the PLS53-150 LiftStik is a compact, mast-style powered lifter transporter. The unit is configured to place the platform and loads weighing up to 150 pounds directly over the four wheels for maximum stability during maneuvering and lifting. Using the fingertip control switch, operators can position loads at any height—from 4.5 to 53 inches—at speeds up to 4.75 inches per second. Lift controls are conveniently mounted on the push/steer handle and can be accessed when transporting loads. The battery-powered lift mechanism consists of a steel reinforced cam belt with no hydraulics. Two platform



options are offered: 17.75 x 15.5-inch wood laminate or 19.5 x 19.5-inch high-density polyethylene (HDPE) plastic. **Presto Lifts**, 800-343-9322, www.prestolifts.com.

For classified advertising, or for more information, contact:

Susan Sammons, susans@caseyreps.com

847-223-5225, Ext. 14



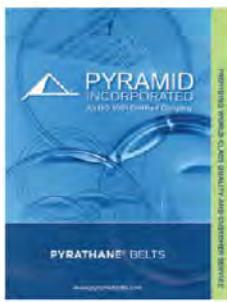
FLIP IT OVER NOTHING FALLS OUT!

You'll feel secure moving regulated and non-regulated, dry materials in this UN-, DOT-certified, bulk plastic container. Even if it flips over in an accident, our new fastening system keeps it covered. **No mess, no pallets, no problems.**



Call for quote: 800.829.4535 • Free pdf at MODRoto.com

Shaping Your Ideas in Plastic



POWER TRANSMISSION STRETCH BELTS
Pyramid Inc. has manufactured round and flat Pyrathane® belts for over 40 years. Pyrathane® belts are used in a wide variety of low and fractional horsepower drive applications such as live-roller conveyor systems, as well as transport devices for paper, currency and small parts. Pyrathane® belts are manufactured to our customers' specifications and are of the highest quality with exceptional abrasion resistance and durability.

Pyramid Inc.
522 N. 9th Ave. E. • Newton, IA 50208
Phone: 641-792-2405 • Fax: 641-792-2478
E-mail: sales@pyramidbelts.com
Website: www.pyramidbelts.com

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

1. Publication title: Modern Materials Handling. 2. Publication No. USPS 911-680. 3. Filing date: October 1, 2015. 4. Issue frequency: Monthly. 5. No. of issues published annually: 12. 6. Annual subscription price: US \$139, CANADA \$219, OTHER INT'L \$269. 7. Complete mailing address of known office of publication: Peerless Media, LLC, 111 Speen Street Ste 200, Framingham, MA 01701. 8. Complete mailing address of headquarters or general business office of publisher: Peerless Media LLC, a division of EH Publishing, 111 Speen Street Ste 200, Framingham, MA 01701. 9. Full names and complete address of the Publisher, Editor and Managing Editor: Publisher, Brian Ceraolo, Editor, Mike Levans, Managing Editor, Noel Bodenbun, Peerless Media, LLC, 111 Speen Street Ste 200, Framingham, MA 01701. 10. Owner: Peerless Media, LLC, Division of EH Publishing, 111 Speen Street Ste 200, Framingham, MA 01701. 11. Known bondholders, mortgagees and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities: None. 12. Tax Status: Has not changed during preceding 12 months. 13. Publication title: Modern Materials Handling. 14. Issue date for circulation data: September 2015.

15. Extent and nature of circulation:	Average No. Copies Each Issue During preceding 12 Months	Actual No. Copies of Single Issue Nearest Filing Date
A. Total no. copies (net press run)	59,954	59,568
B. Legitimate paid and/or requested distribution (by mail or outside the mail)		
1. Outside County paid/requested mail subscriptions stated on PS Form 3541	55,262	53,940
2. In-County paid/requested mail subscriptions stated on PS Form 3541	None	None
3. Sales through dealers and carriers, street vendors, counter sales and other paid or requested distribution outside USPS	20	19
4. Requested copies distributed by other mail classes through the USPS	None	None
C. Total paid and/or requested circulation (sum of 15B (1), (2), (3) and (4))	55,282	53,959
D. Nonrequested distribution (by mail and outside the mail)		
1. Outside County nonrequested copies stated on PS Form 3541	3,623	4,394
2. In-County nonrequested copies stated on PS Form 3541	None	None
3. Nonrequested copies distributed through the USPS by other classes of mail	None	None
4. Nonrequested copies distributed outside the mail	473	1,153
E. Total nonrequested distribution (sum of 15D (1), (2), (3) and (4))	4,096	5,547
F. Total distribution (sum of 15C and 15E)	59,378	59,506
G. Copies not distributed	266	62
H. Total (sum of 15F and 15G)	59,644	59,568
I. Percent paid and/or requested circulation (15C divided by 15F times 100)	93.10%	90.70%

16. Electronic Copy Circulation	Average No. Digital Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
A. Requested and Paid Electronic Copies	22,128	22,700
B. Total requested and paid print copies (line 15C) + requested/paid electronic copies (line 16A)	77,410	76,659
C. Total copy distribution (line 15F) + requested/paid electronics copies (line 16A)	81,506	82,206
D. Percent paid and/or requested circulation (both print & electronics copies) (16B divided by 16C x 100)	95.00%	93.30%

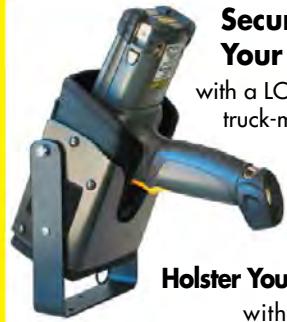
(YES) I Certify that 50% of all my distributed copies (Electronic & Print) are legitimate requests.

17. Publication of Statement of Ownership: Publication required and will be printed in the October 2015 issue of this publication.

18. I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).

Michelle McKeon (signed), Senior Audience Marketing Manager, 9/30/15

Bumpy Rides?



Secure Your Terminal
with a LOGISTERRA® truck-mount Holder

and...



Holster Your Side Arm
with a Gun Belt
(left/right changeable)

- Proven products
- Years in service
- Made in USA
- Deployed worldwide

LOGISTERRA, INC.
619-280-9992
info@logisterra.com
www.logisterra.com

Douglas Thomas

TITLE: Professor of Supply Chain Management, Pennsylvania State University

LOCATION: State College, Pa.

EXPERIENCE: 16 years on the faculty at Penn State

PRIMARY FOCUS: Integrated supply chain planning, including inventory management and demand planning.

Modern: We hear a lot about the jobs going unfilled and the competition for talent, which is hard to understand given the unemployment rate. However, research you and your colleagues have done with Deloitte found that the talent squeeze is real.

Thomas: The talent squeeze is real, especially when you talk about graduate-level training. We think there are a couple of reasons for that. One is that the number of applications into traditional MBA programs in general is dropping. The job market is good, and people are staying in their jobs. Meanwhile, banking and finance are coming back, so MBA students are going into those areas and not into operations. I think the industry hasn't done a good job of getting across the idea that this is a great time to be in the fulfillment industry. Finally, many organizations that have talented people in operations rotate them into general management. They may have a demand planning group with talented people who have been on the job for a number of years, but there isn't a plan to develop their careers.

Modern: Is the challenge the same for large and smaller companies?

Thomas: Anecdotally, I think it's more of a challenge for smaller companies. I was recently looking at our survey results and realized that 84% of the respondents were at companies with \$1 billion plus in revenue, so a lot of our insights are coming from medium-sized companies on up. Those large companies come to a campus like Penn State every year and are looking to recruit a number of students. It's harder for a small company that may only need to hire one student a year—or every couple of years—to stand out.

Modern: What are some of the things companies can do to make their organizations a place where employees want to stick around and students want to come to work?

Thomas: Let's start with the issue of retaining talent, especially talent that doesn't want to take time off to get a full-time MBA. Companies can find ways to make sure their employees get the continuing education they need to keep up with the pace of change. Academic institutions are addressing this by pivoting the educational offerings. There's a big growth in online master's programs for fully employed people, and we're seeing growth in short, focused skills-based executive programs that offer a deep dive into a subject. For instance, online purchasing continues to grow, and offers such as free shipping have changed how consumers order things and what happens in fulfillment centers. These are problems that someone who got their MBA a while



ago didn't deal with. Let's face it: The rate of change in ideas is so fast that you need a lifetime of education.

Modern: What are some of the ideas for raising the profile of supply chain management on campus?

Thomas: I think we have an obligation as faculty to talk about some of the great challenges and exciting problems there are to solve in this field. One of the things we do at Penn State is to have alums come back who have gone on to high-level positions where part of their path was supply chain.

Modern: How can companies raise their profile for recruiting on campus?

Thomas: They need to promote their brands so they're on the minds of students when they recruit. Every student knows Apple, Dell, Amazon and the big consulting firms. Companies that don't have recognized brands but may have great supply chain organizations need to make sure they have a presence. They can do that by doing some of the things that someone like Deloitte does to have influence on the program and to find students. □

Subscribers Save 10%! Use Promo Code: MHSUB10

What's Next in SUPPLY CHAIN? MANAGEMENT?

What you need to know for **2016** and **beyond**

Exclusive 1½ day Summit providing Supply Chain Executives with insight and strategies to lead their company through the most critical financial, cultural, technological and economic challenges impacting the future of the global Supply Chain.

Keynote Presentations:

The Economic Forecast for 2016-2017



Brian Beaulieu
CEO
ITR Economics

Culture Eats Strategy... And How To Deal With It



Steven Melnyk
Professor of Operations &
Supply Chain Management
Michigan State University

SupplyChain
OUTLOOK
SUMMIT 2015.

November 2-3 • Chicago, IL

Produced and organized by:
SUPPLYCHAIN
MANAGEMENT REVIEW

Platinum Sponsor:



Gold Sponsor:



Silver Sponsor:



Sponsors:



Register Today at SupplyChainOutlook.com or Call 508-663-1500 x479

4,200 Orders Picked per Hour... **ZERO** Picking Labor!



How about lines or items per hour?

The Dispen-SI-matic A-Frame system can dispense up to 5 items per second per channel with an unlimited number of channels.

Eliminate up to 80% of Your Labor?

The A-Frame is ideal for order profiles ranging from ecommerce to store orders and every profile in between.

Maximum Flexibility

Both portable and workstation A-Frame models are available based on volume, floor space and order profiles.

Dispen-SI-matic A-Frame Benefits

- Pick-to-tote error free accuracy
- Fast Return on Investment (ROI)
- Greater value than any AS/RS technology

Free Analysis & ROI

Ready to take your order fulfillment operations to the next level? Call, email or visit our website for more information.

 **SI SYSTEMS**

800-523-9464 | info@sihs.com
www.sihs.com/A-Frame

