Southern Wine & Spirits of America: Top-shelf distribution

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from left: principals Robert Pavone, Gary Nedd, Jack Brennan, Mark Booth and Steve Harden are photographed with the AS/RS at the Southern Wine & Spirits DC
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ProMat and Automate set records

THE FINAL TALLY of ProMat attendees topped 37,000 this year, an 8.8% jump over 2013. Covering 340,000 net square feet of exhibit space in Chicago’s McCormick Place, the event included 802 exhibiting companies.

“ProMat 2015 was the largest in the event’s 30-year history,” said George Prest, CEO of MHI. “The energy level among visitors and exhibitors was at an all-time high. ProMat visitors came with a confidence that has not been seen in manufacturing and the supply chain for many years.”

According to registration data, 86% of attendees had buying authority and 39% plan on spending $1 million or more over the next 18 months on equipment and systems.

ProMat was again co-located with Automate, which also set new records with 18,115 attendees from 73 countries. According to the Association for Advancing Automation, the exhibition was 76% larger, attendance jumped 61%, and conference participants grew 63% over 2013. ProMat 2017 and Automate 2017 will be held at McCormick Place from April 3-6, 2017. The next MHI-produced event is Modex 2016, scheduled for April 4-7, 2016 in Atlanta.

Kenco, University of Tennessee partner on warehouse study

KENCO, A PROVIDER of logistics solutions and materials handling equipment, has partnered with the University of Tennessee (UT) to publish a report focused on warehouse best practices.

The report, entitled “The ABCs of DCs,” is the fifth in UT’s Game Changing Trends in Supply Chain series. The supply chain management faculty at UT Knoxville’s Haslam College of Business surveyed more than 200 companies and gathered input from Kenco’s industry experts.

“This study outlines the most significant challenges we’ve seen our clients facing over the past few years, and it conveys creative solutions to meet the growing demand on warehousing providers for information technology and value-added services,” said David Caines, chief operating officer at Kenco. “It’s worth noting that the trends identified in the study cut across virtually every warehouse business model.”

Propane forklift users still eligible to claim tax credit on fuel used in 2014

PROPANE FORKLIFT OPERATORS have until Aug. 8, 2015, to make a one-time claim to receive a 50-cent per gallon alternative motor fuel tax credit for every gallon of propane used in 2014.

The claim provision was part of the Tax Increase Prevention Act of 2014, signed by President Obama on Dec. 19, 2014.

The Internal Revenue Service has defined forklifts as an off-highway business motor vehicle, making them eligible for the alternative motor fuel tax credit. The IRS indicated that the end-user of the forklift is the person who should receive the tax credit, not the propane marketer.

Forklift operators must take a few steps to register with the IRS before becoming eligible for the tax credit. For more information about propane use in industrial applications, visit www.propane.com/industrial.

Report: Employers say Millennials still lack some skills

DURING THE WHITE HOUSE Upskill Summit, the HR Policy Foundation released its “Talent Sustainability Report: The CHRO View From the Front Lines of the War on Talent.” The summit aims to highlight strategies companies are using to develop employee skills. The event brings together business leaders, think tanks and worker representatives. Key findings include:

- IT professionals and engineers are the most competitive positions for which companies recruit.
- More than two-thirds of employers report their Millennial workforce as being above average (59%) or exceptional (8%).
- Employers report Millennials often lack some foundational skills including: communications (40%); professionalism/work ethic (33%); leadership (29%); self-direction (22%); critical thinking/problem solving (20%).
- Nearly one in four employers report between 26% and 50% of their workforce will be eligible to retire in the next five years. Another 48% of employers report between 11% and 25% of their workers will be eligible.

“While skill lifecycles are shortening, and competitive advantage is increasingly transient, it has never been more critical for companies to align their talent strategy with their business strategy,” said Jaime S. Fall, vice president of workforce and talent sustainability for the HR Policy Foundation.
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Have you started the cybersecurity conversation?

Manufacturers, retailers and third-party logistics organizations are investing massive amounts of effort and money—in a very short period of time—to ratchet up systems automation, install collaboration software and deploy mobile technology across the enterprise that can keep up with the pace of our new world.

Indeed, the futuristic concept of the Internet of Things (IoT)—networks of sensors, smart machines, RFID and software connected in the cloud—is becoming a reality across global supply chain operations. Terms like “visibility,” “interoperability,” “mobility,” and “connectivity” are all part of our current industry vernacular as we race toward this seamless network that will ideally help supply chains respond to data and make it more usable.

“The great promise of the IoT is that information technology systems will have a real-time understanding of conditions, events and material movements in the physical world,” writes our Roberto Michel. “And, while there’s still a fuzzy understanding of how the IoT translates into practical use, the pieces of the technology are falling into place.”

Steve Banker, who heads up the supply chain and logistics consulting team at ARC Advisory Group, couldn’t agree more. In fact, he refers to it as the “Industrial Internet of Things” (IIoT) to differentiate it from consumer applications. “The key to understanding what’s happening is to not let the futuristic context of IoT—or any of the buzz terms—intrigue you. The acronym is new, but the concept is not, particularly in distribution center and logistics management.”

For example, an RF gun, voice recognition, scanning, tracking and tracing on and off a truck, GPS, mobile phones, temperature monitoring, and other sensors embedded throughout a DC and as part of the freight are certainly not new—but all provide IoT-style sensor data. “And the good news is that prices on sensors, networking and other key parts of this technology stack are falling quickly…and we’re making progress without many realizing it,” says Banker.

The possibilities are endless, and when you think that Gartner projects that by 2020 there will be 26 billion “things” connected within the IoT, the supply chain visibility opportunities boggle the mind—in fact it’s downright Utopian.

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However, this month Modern’s associate editor Josh Bond issues some strong words of caution starting on page 44, our first deep look into cybersecurity and its growing importance in distribution and logistics operations.

“Think that between every connected device lies a potential cybersecurity risk,” says Bond. “And when you fully consider the consequences of even a single security breech in just one of these links, users will quickly realize that security measures can no longer be an afterthought.”

Bond has amassed a terrific group of cybersecurity professionals to open the minds of Modern readers and bring these concerns to the table. “Many are even revisiting the pre-Internet network security concept of AAA, which calls for authentication, authorization and accounting at each access point,” says Bond. “However, there’s no silver bullet solution. The only call to action at this point is to start the conversation as soon as possible.”
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Swisslog acquires warehouse automation provider Forte

THE DEAL BRINGS TOGETHER A LARGE GLOBAL SOLUTION PROVIDER KNOWN FOR HEAVY AUTOMATION WITH A SMALLER MIDWESTERN INTEGRATOR WITH SOFTWARE EXPERTISE.

BY BOB TREBILCOCK, EXECUTIVE EDITOR

WHAT DO YOU GET WHEN YOU bring together one of the world’s largest providers of materials handling automation—No. 9 on Modern’s annual list of the Top 20 System Suppliers with $712 million in annual revenue—with a smaller systems integrator best known for its warehouse execution system (WES) and mid-level automation here in the states?

That’s a question Swisslog and Forte are about to answer following the announcement of Swisslog’s acquisition of the Mason, Ohio-based system integrator. A consulting, systems integration and software technology firm, Forte plans, designs and implements materials handling automation systems with its WES as the core of each solution.

According to the companies, Forte’s expertise in conveyor systems, case and piece picking, and sortation solutions, particularly in the e-commerce and multi-channel retail segment, will strengthen Swisslog’s offering in North America. Tom Rentschler, Forte’s vice president of sales and marketing, described it as an opportunity for Forte to compete for larger projects with bigger companies.

“We have always had a reputation for doing excellent work with mid-sized companies, but that has never scaled because a lot of bigger clients ask about our size and our success plans,” Rentschler said. “That all goes away with the backing of Swisslog. One of the things they told us throughout the process is that they were buying our management team.”

With the acquisition complete,
management transitions from founder Gene Forte to AK Schultz, who was previously vice president of customer service for Swisslog North America. Otherwise, Forte’s management team will remain in place.

“I am enormously proud that a global systems integrator with the stellar reputation of Swisslog sees Forte as such a valuable addition to their team,” Forte said.

According to Bill Leber, Swisslog’s director of business development and marketing, Forte will continue to operate within its well-established business model as a separate unit of Swisslog from its Mason, Ohio, headquarters. However, it will have access to Swisslog’s broader portfolio of technologies, including automated storage and goods-to-person solutions.

MANUFACTURING

MIT Forum for Supply Chain Innovation launches Manufacturing Innovation Consortium

In its latest effort to unite academics and industry members, the MIT Forum’s new consortium will bring together members of the global manufacturing and retail industries to collaborate on industry challenges and share research insights in data science, technology and supply chain optimization conducted by the Forum’s founder, MIT professor David Simchi-Levi.

“There are two major trends: labor cost and risk,” Simchi-Levi said in a recent interview. “For a period of about 10 years, costs in China year over year were up almost 20%. In the United States over the same period we saw an annual increase of only 3%. If companies made sourcing decisions 10 years ago in an effort to move to low-cost manufacturing locations they probably need to revisit those decisions.”

Automation factors heavily into labor considerations, since the proliferation of automation throughout the world means costs are less about where an item is produced. “It is not about low-cost manufacturing,” Simchi-Levi said, “it is about people who interact with technology.”

Simchi-Levi noted a clear trend toward re-shoring. In September of 2012, a survey of about 300 manufac-
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A study finds that the current operating environment demands a more analytical, agile and clinical view of risk.

**MANUFACTURING**

**Deloitte and MAPI study highlights pressing need to evolve manufacturing risk management**

A new study, “Understanding Risk Assessment Practices at Manufacturing Companies,” uncovers a pressing need for the industry to evolve its risk assessment capabilities.

The study, jointly conducted by Deloitte and the Manufacturers Alliance for Productivity and Innovation (MAPI), looks at how manufacturing companies are assessing and responding to risks today and in the future. The study finds that the current operating environment demands a more analytical, agile and clinical view of risk.

“Our research shows that risk management is a true differentiator in performance, but it needs to be aggressive,” said Brian Clark, partner at Deloitte & Touche and co-author of the study, in a recent interview. “Companies could invest more in these capabilities, and in many cases they should. You can’t put chips on every number on the roulette table. But you can understand risks to which you are most vulnerable, and use that to drive how you place your bets.”

Between customer expectations and intellectual property theft, the need to address risks that are unknown is more important than ever, Clark said. “It’s easy to react to known risks. That’s a trap manufacturers can fall into, since manufacturing companies asked if they were considering moving manufacturing facilities from overseas back to the United States. At the time, 33% were considering re-shoring and 15% had already made the decision to move.

In 2014, 13.5% again said they had already made the decision to move some manufacturing stateside. Those considering made up 18% of respondents. “That is still a big number, and a big impact,” Simchi-Levi said. “It is a change in the way companies manage the supply chain.”

Between customer expectations and intellectual property theft, the need to address risks that are unknown is more important than ever, Clark said. “It’s easy to react to known risks. That’s a trap manufacturers can fall into, since...
the core difference between 1985 and 2015 is velocity,” he said. “Many of the
same risks are present, but the speed of onset is very different. You can’t
slow down the velocity of consumer sentiment, and you can’t deny the
velocity of progress and miss out on an opportunity.”

Clark said that the current envi-
ronment makes it important for a
broader cross section of employees
in an organization to be aware of
risks. Collective knowledge is where
the solution lies, he said, more so
than any one person’s actions.

“It’s a journey, not a destination,”
Clark added. “It’s not about annual
reviews, but an ongoing discipline.
For successful companies, this is part
of their DNA and how they assess op-
portunities.”

SECURITY

Frost & Sullivan: Need for cybersecurity lies in
every sector

The increasing number of connected
devices is multiplying the probability
of cyber-attacks on companies across
sectors, according to new research
from Frost & Sullivan.

The exposure is compelling orga-
nizations to adopt cybersecurity solu-
tions to secure computing resources,
information, networks and applications. Securing perimeter, network,
endpoint, application and data is par-
ticularly crucial due to the emergence
of new threats on specific targets.

“The deployment of IoT, especially,
will open up innumerable attack sur-
faces for cyber-attackers to leverage,”
said technical insights research analyst
Debarun Guha Thakurta. “As a result,
endpoint and wireless network security
for IoT will leap to the forefront of
technology development and wide-
scale adoption.”

Since most cybersecurity solutions
are only able to identify an attack
after considerable damage has been
done, the research emphasizes that it
is essential to spot and nullify threats
at the point of inception.

“The integration of futuristic
technologies and mechanisms
such as predictive threat analyt-
ics, machine learning, and network
and device behavior analysis will
quicken the march toward proactive
cybersecurity solutions,” Thakurta
said. “The convergence of neural
networks, machine learning, and
predictive analytics will further lay
the foundation for a plethora of next-
generation cybersecurity solutions.”

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In the battle against lift truck downtime, an emphasis on speedy response times has allowed an insidious money drain to persist: the unnecessary service request. According to Josh Landreman, senior manager of product support for UniCarriers Americas, the goal is to make sure each expense is valid, and that means service providers have to act as managers, not just dispatchers.

“If I were setting out on the fleet management path, I’d look for savings in erroneous repairs,” Landreman says. “Say a technician repairs a starter, comes back later and identifies a battery issue. Why didn’t he identify that on the first visit? If a dealer improperly diagnoses something, they should absorb those costs instead of passing them on to the customer.”

The dealer team can often identify these trends better than the customer, but managers should be able to review service events on a per-unit basis. Whether or not that kind of visibility is easily accessible, Landreman says more communication can only help the process.

“Take a common call, an emergency, and the customer doesn’t hear anything from the service provider until the technician shows up,” Landreman says. “But if he’s four hours away, the customer might call again and re-dispatch a technician. We have acknowledged the call and the problem, but we should also provide a time frame for the customer.”

Proactively notifying the customer will ensure ideal management of the precious minutes between equipment failure and repair. Will three hours be OK, or should we try something else? Maybe an emergency subcontractor in the area can address the problem quicker.

Of course it’s even better to prevent problems in the first place. High turnover makes operator behavior tricky to monitor, but basic data can track the root cause. “If lift truck No. 1 continues to fail between two operators, there’s a problem with the truck,” Landreman says. “If there are similar issues across several trucks, the operator might be the problem.”

While telemetrics can grant quick access to plentiful data, Landreman suggests adoption has not taken off at the pace some expected.

“Instead, we as service providers are taking as many avenues as we can to collect and present data somehow electronically so customers can quickly see the costs of a specific lift truck, or the status of one under repair,” he says. “In the past, we have even seen telemetrics create negative experiences for some customers, which has prevented them from considering similar technologies again, even as advances address some of their concerns.”

In addition to scrutiny of each service event, granular data can help control costs over the long term. For example, Landreman describes a facility in the California almond industry, which only produces during a certain time of year. “They know they are going to run the fleet hard and have higher costs,” he says, “but instead of paying that entire bill in a short time they can spread costs across a year in the contract.”

Josh Bond is Modern’s associate editor and can be reached at jbond@peerlessmedia.com
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Automotive embraces collapsible, reusable totes

Compatible with AIAG bulk containers, supplier-agnostic, handheld totes help automakers reduce freight costs.

By Sara Pearson Specter, Editor at Large

With BMW, Honda, Kia, Mazda and Audi recently opening or building new assembly plants in Mexico—joining existing Nissan, Toyota, Daimler, Volkswagen, General Motors and Ford facilities—Bloomberg Business predicted in January that the country will surpass Japan as the second-largest auto exporter to the United States before 2015 ends.

Those assembly plants receive a portion of their parts and components from locations north of Mexico, says Dave McCulloch, vice president and managing director of Schaefer Systems International’s packaging systems division.

“Outside a transportation distance of 500 miles, return freight becomes a major cost factor,” he says. “For that reason, there’s been a steady movement in the automotive industry to deploy collapsible reusable packaging to eliminate shipping air on the return trip.”

Collapsible, reusable bulk containers that conform to the Automotive Industry Action Group (AIAG) 48 x 45-inch standard footprint are widely used in the industry. However, smaller, collapsible handheld totes are gaining appeal.

That’s why Schaefer developed the ergonomic CF collapsible container line. Offered in three different footprints and three different heights, the CF containers can be grouped in layers of four, six or 12 containers, placed on a pallet with a lip and secured with a top cap.

“What’s unique about the CF containers is that they can be stacked with any straight-wall 48 x 45-inch series handheld container, bulk container or pallet with a lip, from any manufacturer—not just Schaefer’s,” McCulloch says.

For the nearly 40% of automotive parts that don’t require protective dunnage, collapsible reusable packaging is ideal. “Depending on the footprint of the CF container used, they yield a return ratio of 3:1 or 4:1, which can produce up to 75% savings on return freight. For OEMs spending millions annually on logistics, there’s a significant advantage in using collapsible handheld or bulk reusable packaging,” he says.

To help maximize packaging density, Schaefer’s packaging specialists conduct cube calculations and analysis. “We can figure out how many parts per container, and how many containers per pallet, to determine the best container or combination of containers. By right-sizing the packaging, we can often get more parts per pallet using less containers—which further saves customers money on the initial investment and logistics,” says McCulloch.

Sara Pearson Specter is an editor at large with Modern and can be reached at sara@saraspecter.com.
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In Northern California, the nation’s largest distributor of wine and spirits has built a state-of-the-art facility that sets a new industry standard for automated distribution.

The first thing you notice in Southern Wine & Spirits’ 334,000-square-feet Atlantic Street distribution center in Union City, Calif., is an automated storage and retrieval (AS/RS) system that reaches 55 feet to the top of the building. Inside, storage and retrieval machines (SRMs) move two pallets at a time in and out of 10-deep pallet rack. The pallets replenish full-case picking locations inside the AS/RS and fill orders for full pallets of wine, spirits and non-alcoholic products for delivery to on- and off-premise retail establishments.

The second thing that stands out is the two-level, split-case bottle picking room, where associates use RF and voice technology to pick mixed cases that are delivered by conveyor to a mezzanine-level, high-rate sortation system. That’s where large waves of cases are sorted into smaller sub-waves, and then sorted again into orders that are delivered in the right sequence for route-stop deliveries for each truck.

AS/RS technology is not new to Southern. The application of AS/RS technology to automatically replenish pick locations is emerging as a best practice in wine and spirits distribution. But, the Union City facility takes this design to a new level of automated throughput and efficiency. Working with a systems integrator (W&H Systems, whsystems.com) and a provider of AS/RS technology (Westfalia Technologies, westfaliausa.com), Southern created a fulfillment center that directly services retail customers and also sends trailer-load quantities of product to smaller crossdock depots that then transfer the product into delivery vehicles for last-mile delivery to a local area.

As designed, the new facility allows Southern to:
- manage 12,500 SKUs with storage capacity for more than 1.8 million cases;
- process 6,000 cases per hour with a sortation system that can handle 10,000 cases per hour;
- deliver accuracy rates from 98.5% to 99%;
- double storage density from roughly three cases per square foot to more than six cases per square foot in this facility;
- increase productivity from 180 cases picked per man hour to 300 cases picked per man hour; and
“This facility secures our future volume growth for about 20 years, which is our planning horizon.”

—Bobby Burg, senior vice president and chief supply chain officer
In the full case pick module, replenished by storage and retrieval cranes, associates pick full cases to a case conveyor. Orders are aggregated into large waves to reduce the number of visits to a pick location.

- get trucks on the road by as much as two hours earlier each morning.

The AS/RS performs three primary functions. First, it manages the 4,500 fastest-moving SKUs that represent about 82% of the volume that flows through the facility, moving them from receiving into storage locations in a six-level storage area. Next, it replenishes the 1,500 pick locations in two five-level, full-case pick modules in the AS/RS. Finally, it fills full-pallet orders for big box retailers and large grocery chains with ease.

While it is the automation that catches the eye, the heart of the system is the warehouse execution system (WES) software developed for the facility, according to Robert Pavone, vice president of operations for California, and Mark Booth, vice president of distribution and technology. The software orchestrates the flow of material through the building and enables a unique double sortation process that allows Southern to minimize the number of times an order selector visits a picking location during a shift.

It does so by aggregating multiple sort waves into one very large pick wave that is subsequently broken down through two sorts. The first sort breaks the large pick wave into its component sort waves. The second sorts the smaller waves into orders that are married up with cases from another pre-sort that is fed from other picking areas before being conveyed to outbound trucks.

“The software is the heartbeat of the building, along with the people that manage it,” Booth explains. “Without it, there just wouldn’t be enough time to pick, pack and ship the orders on time.”

Most of all, the design meets Southern’s projected growth in Northern California. “This facility secures our future volume growth for about 20 years, which is our planning horizon,” says Bobby Burg, senior vice president and chief supply chain officer. More impor-
tantly, Burg adds, “We made an investment of close to $80 million in this facility. That delivers a message from our leadership to the brands we represent that we are committed to being the leader in California.”

**Meeting new demands**

Over the last 10 years, the wine and spirits industry has been in the midst of a transformation. Small, local family-owned operations have merged into a handful of large distributors with the scale to manage bigger portfolios of product and distribute across multiple states, all in a highly regulated environment. These new distributors are in the process of transforming their networks and capabilities.

Small, conventional facilities are being replaced by larger buildings, which can serve a region with next-day deliveries. Inside, those facilities are evolving from paper-based manual operations to voice-directed picking—complemented by high-rate conveyor, merging and sortation systems and, in some instances, automated storage technologies.

Southern Wine & Spirits has been a leader on both fronts. Since it was founded in 1968 in Miami, Southern has grown through acquisitions and greenfield expansions into the country’s largest wine and spirits distributor. Today, it represents more than 1,500 suppliers and makes weekly deliveries to approximately 200,000 customers in 35 states. In California, the company distributes 31 million cases a year—divided between big box retailers and grocers and some 30,000 restaurants, bars, clubs, hotels and retail outlets.

To service this national footprint, Southern has invested $200 million over the last five years to consolidate, retire or renovate 2.5 million square feet of warehouse space. Another 1 million square feet will be addressed in 2015. “As part of our long-term strategy, we have replaced a number of small-cube buildings with high-volume, high-capacity and high-cube warehouses,” says Burg. Along the way, Southern has moved beyond mere distribution to become a true supply chain focused organization (see box, p. 20, on the Southern Supply Center).

Automation, technology and software play a major role in Southern’s strategy. It was an early adopter of voice-directed picking and automated labeling. Similarly, Southern was an early adopter of materials handling automation, becoming the second distributor in the country—and the first in the private sector—to implement AS/RS technology. The first project in 2010, in a facility in Southern California, featured 17 SRMs that put away one pallet at a time in single-deep rack. “Over the years, we have looked at that system and asked how we could improve on that application,” Burg says.

**Making space**

Union City provided the opportunity to improve on Southern’s original AS/RS application. When the project began, Southern was bursting at the seams in its existing facility—which services nearly two-thirds of the state—from a small depot near the Oregon border in Eureka to Bakersfield to the South. At the same time, little industrial land was available, which meant that any DC had to make the most of every cubic foot of storage. Moreover, with a sortation system capped at 4,500 cases per hour, the facility couldn’t process orders fast enough to meet customer requirements for early deliveries.

“In the past, a majority of our trucks left at 7 a.m.,” says Pavone. “Now, 60% of our trucks are on the road before then, with some leaving as early as 5 a.m. We needed a system that could get our trucks on the road up to two hours earlier.”

An AS/RS that made efficient use of storage space and could handle replenishment of the fastest-moving SKU’s appeared to be half of the answer. To that end, Southern took an emerging design developed for wine and spirits distribution to the next level.

To make maximum use of space, the AS/RS reaches 55 feet high with six levels of 10-deep pallet rack, storing about 1.4 million cases in a 105,000-square-foot footprint, with capacity to store up to 1.8 million cases. In all, about 4,500 SKUs representing 82% of the volume are stored in the AS/RS while the remaining 8,000+, slower-moving SKUs are stored in the conventional warehouse.
Southern realized further space savings in other ways. For instance, the AS/RS is located 100 feet from the receiving dock, shortening the travel time from the dock. Two 200-foot-long pallet accumulation conveyors are located inside the AS/RS for induction into the system. Together, they provide accumulation for two truckloads worth of product. “Our fork trucks can unload 25,000 cases an hour,” says Burg. “The system can put away 100,000 cases in a day.” In addition, the SRMs are moving about 800 pallets a day to replenish pick locations. By locating the accumulation conveyor halfway in the pick module “we never get backed up,” Burg says.

Outside the AS/RS, Southern Wine freed up space by installing the conveyor and sortation equipment on a mezzanine over the receiving dock. Meanwhile, the two-level bottle pick room was installed under the after-sort mezzanine: The fastest-moving SKUs are picked from case flow racks on the first level while slower-moving SKUs are picked from static shelves on the upper level. On the outbound side of the building, spiral conveyors act as an accumulation buffer for cases between the sorter and the shipping dock. “Even though it’s a 334,000-square-foot building, it’s comparable to a 700,000-square-foot facility,” says Pavone. “Our storage density per cubic foot is about double our standard facility.”

The AS/RS also enabled more efficient replenishment of the bottle room where split case orders are filled. In the past, associates would pick cases to pallets and deliver them to the bottle room. Now, once picking is complete at the end of a shift, order selectors in the AS/RS pick cases that are conveyed to the bottle room to replenish case flow rack and static shelves.

**Sorting it out and saving time**

The AS/RS was only half the answer in Union City. The other half was a solution that was more efficient and productive. With a sorter capped at 4,500 cases per hour, the old system struggled to keep up. What’s more, it wasn’t uncommon for an order selector picking full cases to make as many as 200 to 225 visits to pick locations during a shift.

In the new facility, a high rate conveyor, combiner and sortation system is the mechanical engine of the facility. It features two pre-merges, two pre-sorters, three mid-merges and a three-to-one combiner to sort and marry up cases from various picking areas. While it currently operates at 6,000 cases per hour, the sorter can handle up to 10,000 cases per hour as volumes grow.

Meanwhile, a new methodology for creating pick waves reduces the number of visits an order selector makes to each pick location in the full case pick modules. The heart of this new process is WES software that combines a number of sort waves into one large pick wave. For example, if a typical pick wave called for order selectors to pick 125 cases from 20 locations, the software might combine four waves into one large wave of 500 cases. This allows that same number of order selectors to pick for several waves with each visit to a location, reducing the number of visits and the amount of walking to pick the same 500 cases.

The trick, of course, is to then break that very large wave back down into its component parts. That’s where the WES developed for this installation comes into play. It does so through a double sortation process that has been used before in retail e-commerce distribution but is now being adapted to wine and spirits. It works like this:

- Cases from the pick modules accumulate up and onto the mezzanine until it’s time to load trucks.
- When it’s time to load, the software unscrambles the orders through two sorts:
  - Using the example above, the first sort breaks the large pick wave down into four sort waves that are aggregated together for picking.
  - The second sort breaks those individual waves down into orders destined for specific dock doors.
- As the cases begin to flow toward the dock, mixed cases from the bottle room and full cases of slow-moving...
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SKUs picked from reserve storage are merged into the flow.

- Once the orders are married up, the product is conveyed to the right dock door in the right order for route-stop deliveries.

“The sorter may be the engine of the facility, but the software is the heartbeat of the system that drives everything,” says Booth.

The result has been a dramatic improvement in productivity—a nearly 35% increase in the cases per hour handled by the sorter and a 50% increase in the cases picked per man hour. “The ability to get through the throughput we need without adding to head count is the real benefit of what we’ve done here,” says Pavone. “Order line accuracy, customer fill rates and on-time deliveries are critical for us because customers have a choice.”

Burg says the facility not only secures Southern’s future in Northern California, it also represents progress in Southern’s distribution evolution. “I firmly believe the role of our team is one of innovation,” he says. “We have to ask how we can apply best-in-class materials handling technologies in our facilities to deliver value to our customers. This is one more step in that evolution.”

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**AS/RS and a double sortation process speed orders out the door**

Southern Wine & Spirits’ Northern California DC was designed to maximize throughput and accommodate growth for years to come.

### Receiving:
Once pallets are received (1) and staged (2) on the docks, the receiving team verifies the receipt against the purchase order. The warehouse management system (WMS) then determines whether product will be stored in the automated storage and retrieval system (AS/RS) (3) or the conventional reserve storage area (4).

**Put-away:** Pallets destined for the AS/RS (3) are delivered to one of two induction points (5). Once inducted, storage and retrieval machines (SRMs) pick up the pallets and deliver them to a storage location in the system. The SRMs can move two pallets at a time.

Pallets headed to the reserve storage area (4) are scanned by a lift truck operator, who scans the license plate bar code label. The WMS directs the operator to a storage location. The operator scans the pallet and storage location bar codes to confirm the put-away.

**Picking:** Orders are received throughout the day. Since trucks leave early in the morning to begin deliveries, order picking begins late in the afternoon. System-directed picking processes are designed to minimize travel and the number of times an order selector visits a pick face during a shift. Picking is coordinated by the warehouse execution system (WES).

**AS/RS integrated pick modules:** There are two types of pick locations in the (AS/RS) pick modules (6): A dedicated location has room for four pallets of the same SKU. A cluster location holds three different SKUs and one reserve pallet. When a wave begins, pick labels are handed to order selectors who go to a pick location, apply labels to the cartons being picked and place them on a pick conveyor. Cases are automatically scanned by a fixed bar code scanner at the end of the pick modules to confirm the pick. Cases are then conveyed (7) to a pre-merge area (8).

**Bottle pick:** Split-case orders are picked to shipping cartons in a bottle pick area (9) and a cold room (10) where high-end wines are stored. First, the WMS creates a cube for each case and then sends picking instructions to an order selector’s voice headset. Fast-moving SKUs are picked from carton flow racks on the first level. Once all of the items have been picked, they can travel on an Express Lane conveyor (11) to a pre-merge area (8); or, they can travel on a Local Line to the second level, where slower-moving SKUs are picked from shelves. Once those orders are complete, the cartons are conveyed to the pre-merge area (8).

**Other picking:** Full cases of slow-moving SKUs are picked in batches to pallet from the reserve storage area (4) and then inducted onto the conveyor system for delivery to a pre-merge area (8). Southern also stocks some product that does not convey well. Those items are picked to a pallet and delivered to a shipping door (12), where they are...
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**Double sort and order consolidation:** When it is time to load the trucks, cases that have accumulated in the pre-merge area (8) are first broken down into smaller waves; those waves are further broken down with a second sort into orders that will be conveyed to a shipping dock. After the second sort, full cases are married with cases from the bottle pick area and reserve storage. They are then sorted (13) to the right shipping dock for that delivery where they are floor stacked onto the route trucks in the right order for the route stops.

**Replenishment:** During the shift, the AS/RS monitors activity at the pick locations and automatically replenishes pallets as needed. At the end of the night, order selectors in the AS/RS pick modules pick cases to replenish the bottle room for the next day’s orders. Instead of accumulating in the pre-merge area (8), those cases are conveyed to the bottle room (9) where they are scanned into pick locations.

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**System Suppliers**

**SYSTEMS INTEGRATION AND WAREHOUSE CONTROL AND EXECUTION SYSTEMS:** W&H Systems

**AUTOMATED STORAGE AND RETRIEVAL SYSTEM AND ASSOCIATED SOFTWARE (SAVANNA.NET):** Westfalia

**WAREHOUSE MANAGEMENT SYSTEM (WMS) AND VOICE PICKING SOFTWARE:** Manhattan Associates

**VOICE RECOGNITION TECHNOLOGY:** Vocore by Honeywell

**CONVEYOR AND SORTATION EQUIPMENT:** Intelligrated

**ADJUSTABLE CONVEYOR:** Stewart Gipat

**FIXED SCANNERS:** Datalogic

**LIFT TRUCKS:** Toyota; Stock pickers: Raymond; Reach trucks: Bendi

**PALLETS RACK:** Frazier

**BOTTLE ROOM RACK:** Interlake Mecalux; Span-Track

**ROUTE DELIVERY SOFTWARE:** Roadnet Logistics Systems
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Buffer, sequence orders and small parts with Kardex Remstar solution

Used for compact, high-speed case and tote buffering and sequencing, Kardex Remstar highlighted the new sort2ship solution in a press conference.

The system incorporates order lines from storage lifts, vertical carousels and static shelving in a compact footprint. When connected to conveyors and an automatic load-handling device, the system automatically transports containers to a Megamat RS vertical carousel for buffer storage.

“Sort2ship can provide on-demand sequencing to meet customer-specific shipping requirements, automatically routing them to packaging or shipping,” said Tom Coyne, president. “The system enables distribution centers and e-commerce suppliers with several thousand order lines per day to significantly increase their order picking productivity.”

Record-breaking ProMat held in Chicago

ProMat hit new records this year, according to John Paxton, president of MHI, both in terms of numbers of exhibitors and of attendees. With registrations topping 37,091 attendees, show producer MHI announced a 8.8% attendance jump over 2013. The four-day event held in March, covered 340,000 net square feet of exhibit space in Chicago’s McCormick Place with 802 exhibitors. ProMat was once again collocated with Automate.

“This year’s show encompassed all of the products, solutions, and systems needed to drive manufacturing and supply chain optimization,” said Paxton. Combined, the two show floors used 400,000 square feet of space dedicated to helping organizations improve the productivity of their manufacturing and supply chain operations.

ProMat 2015 featured 125 educational sessions, including four keynote, a supply chain workforce summit, and more than 110 show floor seminars focused on the latest materials handling, logistics, and supply chain innovations and applications.

Here are some highlights from the show.

ProMat 2015 covered 340,000 square feet of exhibit space in Chicago’s McCormick Place with 802 exhibiting companies. For Modern’s complete coverage of the show, visit mmh.com/topic/tag/ProMat_2015.
Dematic introduces suite of intra-logistics systems

At a press conference, Dematic featured a range of solutions for factories, warehouses and distribution centers. The new suite, powered by performance-optimizing software, encompasses receiving, storage, order fulfillment, buffer staging, packing and palletizing.

John Baysore, CEO of Dematic North America, said the solutions can be tailored to a wide range of needs, from light- or voice-directed put walls capable of 200 to 400 picks per hour to robotic each-picking systems that achieve 1,200 picks per hour. “These operational improvement methods can be applied in many configurations and capacities, from small point solutions to large integrated systems,” Baysore said. “Because these solutions are modular, flexible and scalable, we can help small companies become big ones.”

Each solution, including very narrow aisle automatic guided vehicles (AGVs), shuttles and automated mixed case palletizing, is managed and controlled by Dematic iQ performance optimizing software. Baysore also emphasized Dematic’s service presence in 67 cities, up from 55 last year. Dematic aftermarket service has achieved a first-time repair rate of 94%, he said.

Intelligrated showcases what’s next for e-commerce

At a press conference, Intelligrated showcased a series of solutions to optimize order fulfillment processes for e-commerce and omni-channel fulfillment operations.

Featuring exhibitions of the company’s software, picking technologies, put wall, automated storage and retrieval systems (AS/RS), conveyor solutions and sortation systems, Intelligrated’s booth was complemented by a booth at Automate highlighting the company’s GoKart autonomous mobile robot.

A live demonstration of the company’s shuttle technology featured the OLS (one-level shuttle) retrieving products from storage. Handling totes and cartons, the system supports goods-to-operator fulfillment, product sequencing and buffering, and just-in-time inventory management applications.

“The theme for our booth is ‘What’s next for e-commerce,’” said Chris Cole, CEO of Intelligrated. “Coordinated by integrated software solutions, our modular and scalable solutions can help manage the transition from pallet to case handling and from case handling to each picking. In all manners, distribution and warehousing are changing, and not just in retail.”

After hiring 300 employees last year and 200 already this year, Intelligrated has also created a dedicated team of 15 individuals within the sales department to meet the increasing demand for aftermarket support.

Scalable multi-level Navette shuttle offered by SSI Schaefer

In its automated systems and materials handling solutions exhibit, SSI Schaefer Systems International showcased the Navette scalable, multi-level shuttle. Flexible, the automated shuttle stores and picks trays, totes or cartons stored within a steel framework of aisles. It is guided by travel and support rails and serves up to eight storage levels.

The entire system can be scaled precisely to fit the widest possible range of items in the storage aisles, explained Mark Dickinson, executive sales manager. “The Navette totally negates the need for SKU slotting, and can get product to and from any location very quickly.”

Solutions based on the Navette can be tailored to order volume, required throughput and individual article structure, he added. “Our 3D-Matrix solution utilizes Navette lifts and vehicles in X-, Y- and Z-axes, allowing it to send multiple products to any location with a throughput increase because products don’t have to be sent to the end of an aisle. Instead they route to the nearest lift and then are on their way.”
SHOW REVIEW

VNA swing-reach truck unveiled by Raymond Corp.

The Raymond Corp. launched an extension of its existing swing-reach (turret) very narrow aisle (VNA) line of lift trucks.

The Model 9800 joins the 9600 and 9700, expanding the product family’s capabilities to higher elevated lift heights and heavier capacities, explained Justin Byma, product manager for very narrow aisle products. “The vehicle has a 3,300-pound base capacity and standard lift heights up to 50 feet,” he said. “It fits a nice slot before our existing Transtacker vehicle, which reaches up to 60 feet.”

Ideal for any company struggling with warehouse floor space constraints, Byma said key markets for the vehicle include textile and apparel, e-commerce, durable goods, wholesalers and manufacturers.

The vehicle was engineered for maximum energy efficiency, with an advanced lift system with electric regenerative lowering and a hydraulic counterbalance that reduces total system energy demand. Its articulated steering mechanism is unique, he added. “It supports better maneuverability in tight spaces.”

JBT debuts AGV with on-board intelligence to target mid-sized needs

With the aim of filling the gap between facilities that rely on automatic guided carts (AGCs) or conventional lift trucks to move materials, and those that use traditional automatic guided vehicles (AGVs) with a central computer, JBT introduced the JayBot AGV.

The new AGV is well suited to this mid-sized niche because it has on-board intelligence and navigation sensors for safety and traffic control, rather than requiring a central management computer, said Mark Longacre, JBT marketing manager.

The on-board smarts and sensors allow the JayBot to navigate without the installation of reflectors, wires or magnets within a facility, which further holds down costs.

When the system is set up, the AGV is driven around the facility to create a baseline of the routes to take, and while in operation, it navigates by comparing what its sensors see to this baseline. “We call it the industry’s smartest AGV because it takes all that intelligence for traffic control and safety and puts it right on the vehicle,” says Longacre.

The lower cost from eliminating traditional guidance infrastructure and a system manager layer makes the JayBot well suited to middle segment applications where AGCs don’t offer enough functionality and where traditional AGV systems are too complex or too costly. The JayBot is capable of precise maneuvering, including the type of positioning needed for servicing racks, stands and other locations.

Yale rolls out variety of new products and fuel sources

A walkie powered by lithium ion batteries, very narrow aisle products, an automated tow tractor, and fuel cell battery replacement packs were among the new products on display from Yale Materials Handling Corp.

With a 25% smaller battery compartment, the MPB045VG lithium-ion walkie pallet truck is more maneuverable inside delivery trucks and retail stores. The battery is UL certified and is backed by a five-year warranty.

As another battery alternative, Nuvera hydrogen fuel cells require no alterations to the standard lift truck, can be fully refueled in two minutes and always perform like a fully charged battery, according to David
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McNeill, manager of product strategy for Yale.

“Customers continue to have issues with lead-acid batteries,” McNeill said. “Instead of dealing with extra equipment or the labor and costs associated with lead-acid, customers can break free of those constraints with our lithium ion and fuel cell options.”

The new very narrow aisle offering can be supported by Yale Aware RFID technology, which uses chips embedded in the floor to inform the lift truck about its environment. No two applications or aisles are the same, and the system can help avoid collisions with overhead obstacles or control speed at the ends of aisles.

Jungheinrich showcases new, 100% U.S.-made electric reach truck

Perry Ardito, general manager of MFCAs Jungheinrich brand highlighted the newest model ETR electric reach truck. “The ETR is the first Jungheinrich model to be completely designed, engineered and manufactured in Houston to meet the North American market demand for this type of vehicle,” he said.

Since the release last summer, ETR sales have vastly outpaced the original forecast, Ardito added. Grocery, e-commerce, retail and other high-throughput applications with higher lifting and heavier capacity requirements are ideal for the vehicle.

Ardito also pointed out a new automatic battery extraction system for the Jungheinrich line of electric counterbalanced trucks, and showed an exclusive warehouse navigation system that works with the brand’s turret trucks and order pickers.

“The navigation system enables semi-automated picking. Once the operator drives the truck to an aisle, the system determines the most productive and efficient path to the pick locations in the racking,” he said.

ORBIS displays solutions for small-format retailers

To reduce unloading time and speed up merchandising in small-format retail stores, ORBIS demonstrated a special line of reusable pallets and totes.

Included is a new 42 x 30-inch nestable pallet that maximizes vertical trailer cube space and enables maneuverability for in-store storage and replenishment. Also featured are FliPak totes that pair with dollies for rapid replenishment in omni-channel applications.

“These products reduce touches throughout the supply chain, optimize truckload space and streamline deliveries,” said Andrea Nottestad, market manager for retail supply chain.

Visitors from industrial, consumer, food and beverage industries also were able to see a customizable five-step supply chain optimization process that can improve product flow and management for cost reduction and better
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Storage and Picking Solutions Made Simple
Honeywell focused on vehicle, operator productivity

Equipped with a 12-inch screen, Honeywell Scanning & Mobility’s new Thor VM3 vehicle-mounted mobile computer gives operators an easy-to-read tool to improve productivity and task accuracy. It features a quick-mount smart dock and field-replaceable front panel screen, permitting easy swap outs for use on different vehicles.

Backwards compatible with legacy Windows software or upgradable to the latest releases, the device works with Bluetooth-enabled, voice-directed picking headsets to maximize efficiencies in activities such as case picking, truck loading, putaway and replenishment, said Bruce Stubbs, director of industry marketing.

“We’re working on ways to positively impact the interface between the worker and the devices to improve their user experience,” he added.

For monitoring of operational performance and worker safety, Honeywell also released the Operational Acuity software portfolio. “It includes two solutions to measure vehicle and workflow performance,” said Stubbs. “It helps identify areas for additional training by collecting data and applying analytics, then turning that info into simple, actionable and measurable process improvements for cost reductions.”

Hyster announces new engines with variable power technology

New IC engines by Hyster Company offer three performance modes for increased efficiency and productivity.

The booth’s theme emphasized customizability of equipment to specific applications, and the new engines enable performance adjustments over the course of a day. For instance, if an application is typically busiest in the morning, the highest performance mode will maximize productivity. During a slower afternoon, a supervisor can switch equipment to the economy mode to consume almost 19% less fuel.

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Tested to withstand 30,000 hours of use, the new engines also produce 10 more horsepower, a 4% increase in acceleration, a 16% increase in performance on grades, 5% faster travel speed, 10% faster lift speed and a 10% improvement in loads per hour.

“Variable power technology enables a balance of superior fuel economy or can maximize productivity during peak business periods when moving more loads is critical to success,” said David LaDue, vice president of the west region for NACCO Materials Handling Group, which also recently acquired Nuvera, a hydrogen fuel cell technology company. “Fuel cells, variable power engines and more than 130 LPG, diesel and electric models allow us to provide a range of solutions tailored to each customer’s needs.”

**Numina Group and Ferretto Group unveils VLM with integrated voice picking**

At a press conference, Numina Group and Ferretto Group demonstrated a vertical lift module (VLM) with integrated voice picking technologies.

The result of a partnership between the two groups, the combination of Numina’s RDS voice picking coupled with Ferretto’s VLM delivers faster product picking and retrieval with improved storage density. Dan Hanrahan, president of Numina Group, said the system occupies 65% less floor space than conventional storage and the voice system can boost productivity by 40% over stand-alone VLMs.

Capable of heights beyond 50 feet, the VLM uses mechanically transportable storage shelves ranging in size up to 13-feet long by 3-feet deep with a weight capacity of up to 2,204 pounds. The system allows simultaneous picking and storage of parts, kits, finished product and direct-to-consumer orders.

“Additionally, the control system uses off-the-shelf components available at hundreds of North American distributors,” Hanrahan said. “This eliminates stocking of costly proprietary parts and allows customers to readily source spares and perform in-house maintenance.”
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Rack design is moving from the concrete to the C-suite as more users quantify the impact of storage on process efficiency.

By Josh Bond, Associate Editor

The thinking around racks right now centers on two familiar concepts: Safety practices and risk mitigation are not nice-to-haves, they are must-haves; and solution development. New seismic standards have gotten plenty of attention lately, but experts agree unanimously that the overall enforcement landscape is much stricter. And, judging from the state of safety practices surrounding maintenance and reconfiguration of racks inside many facilities, this is a very good thing.

Aside from enforcement, the need to increase efficiency is changing the way racks are designed. The combined pressures erode commoditization of rack systems, since the number of storage locations, aisle width and slab designs provide nowhere near enough information to properly specify a storage system.

Will the storage be archival and expected to hold loads for a long time, or will there be lift trucks buzzing around accessing it all the time? To boost safety, achieve compliance and cut costs, the design of racks and storage media must match the application as closely as possible.

“Successful rack users start with the rack system when designing any new facility,” says Al Boston, owner of AK MODERN equipment report

Processes are often designed long after the racks are put in, but more companies are evaluating rack design before they pour a foundation.
Materials Handling. “If a main part of your business is storage and handling, you should consider the rack before you even start with the building. But many people still try to fit the rack to the building. It’s like buying a sports car and then asking your wife and kids to get in. You should have bought a minivan.”

Then again, the sports car might someday make sense. With an eye toward flexibility, rack users are evaluating what the storage can do to make processes, people and equipment more effective now and in the future.

Structured safety
For now, there’s some catching up to do. “We see things that frankly would turn your stomach in terms of the condition of rack, hasty reconfigurations, no load capacity signage and abuse,” says Steve Rogers, vice president of Hannibal Industries. “That should keep both the operations and executive sides of the house awake at night.”

Those camps often have different agendas, where one wants to invest and the other prefers to spend as little as possible, but safety is a good way to bring them together. Once teamed up, many will not have to look far for critical improvements. John Krummell, president of Advance Storage Products, offers an analogy. “If you saw a truck with a bad tire, you wouldn’t hesitate to change it because you know it’s a safety issue,” he says. “Now if you see rack with dents and dings you say, ‘well, it hasn’t fallen over yet so it must be OK.’”

The scenario is even found in large, sophisticated operations with cash on hand. Krummell said it took two years to convince one big account it needed a formal rack safety program. A related benefit of such a program is to support changes in rack systems. As SKUs, slots, loads and equipment change, a fine-tuned storage system should be able to adapt accordingly. That nimbleness is good for regulatory
As high-density facilities are pressured to fill smaller orders, homogeneous storage systems might be converted to support different picking processes.

compliance, but should also improve productivity and efficiency.

In fact, Boston suggests the pursuit of efficiency got jumbled up along the way with the idea of rack as a sturdy 30-year fixture. “Years ago, much of it was probably over-engineered, which was good and conservative,” he says. “Lately, efforts to drive out costs have produced rack products that might occasionally have verged on too cheap.”

Instead of over-paying for robust beams or creating massive safety risks with inadequate ones, best practices closely match racks to the application. But again, applications change. “Across the industry, there seems to be more emphasis on rapid order fulfillment,” says Dave Olson, national sales and marketing manager for Ridg-U-Rak. “Top distributors have raised the bar and retailers and consumer product companies are playing catch-up in an attempt to fill online orders or get closer to 48-hour cycles.”

This grows the diversity of storage systems going into large DCs, Olson says, as they work to increase inventory turns and justify rack systems for the various types of products and how they ship. These pressures have a substantial impact on operations with either relatively new or aging systems.

“When you first set up your facility for pallet storage, it worked fine,” Krummell explains. “But demand has changed slowly over time. One of your customers says they want rainbow pallets. You handle it, if not very well, then another customer asks, then half your customers, and soon the whole thing is in chaos.”

This is when rack users, in a well-meaning effort to keep up, might take it upon themselves to modify racks in questionable ways. “We design to a specific set of specifications, and everything is interconnected,” says Olson. “If you start taking beams out and moving things around, you could be affecting the load carrying capacity.”

**Regulatory aftershocks**

The current code enforcement environment is less likely to overlook such modifications. Boston says that in just the last five years things have become much stricter around the country.

“Years ago racks were designed for one of five seismic zones. It was a more generic, broad technique,” Olson says. “Now virtually every zip code, almost every street address, has different requirements. The U.S. Geological Survey and various code enforcement bodies have defined it so that there might be different parameters for facilities a block apart.”

Seismic concerns often prompt further scrutiny of rack design, but there are some common misconceptions. Rack designed for earthquake resistance does not always mean a more rigid structure, Olson suggests, and in fact might be more flexible. An impact from a lift truck can do a significant amount of damage to any rack. And, even though the impact load is localized, it can cause a collapse where an earthquake would not.

Even if an operation aimed to replace an entire existing rack system with an identical, blemish-free one, grandfather clauses can’t shield it from new regulations.

“With increased safety awareness and permitting requirements becoming more stringent, it’s getting harder for people to just go and change their existing racking systems,” Krummell says. “A customer might call and say they have a 15-year-old system, want to change it and can’t because of codes. It puts the customer in a tough place.”

This is especially shocking when a customer has already bought a building or poured a slab. Krummell says...
most of Advance’s business is building to a specification, but more and more customers are pursuing earlier involvement with rack suppliers. “We’re working with customers to lay out facilities, develop the best solution, and work with suppliers of conveyors and other equipment to prove the flow of a given module,” Krummell says. “That trend will continue.”

Racks, shelves and a seat at the table
Between codes and the desire for optimum efficiency and productivity, rack systems benefit from a detailed

Consolidating frozen storage to optimize growth and logistics
Drive-in rack helps frozen food supplier expand, cut costs and improve safety.

Coloma Frozen Foods was outsourcing or leasing its frozen storage to four commercial facilities spread out over a 20-mile radius in southwest Michigan and needed to consolidate its frozen storage capacity. After building 75,000 square feet of racked freezer space in a new centralized 90,000-square-foot campus facility, the company anticipates a two-year ROI for the project.

“Transferring product between four inter-company locations for production, frozen storage and repacking was costly and inefficient,” says Brad Wendzel, president of Coloma Frozen Foods. “One of the leased freezer facilities had aged beyond its useful life, and much of the racking was too low, requiring inefficient pallet unstacking and restacking before shipping.”

Looking to maximize frozen storage efficiency and repacking capability, the company installed a rugged bolted rack system with structural channel columns (Steel King Industries, steelking.com). Using drive-in rack for its cost-effective, high-density storage capacity, the facility stores 23 million pounds of frozen product, including 9,000 pallet positions of drive-in rack. The rack is five levels high and includes a floor level. It is arrayed from two to five pallet positions deep.

“We expect to save about $150,000 to $200,000 a year in reduced labor, management, transportation, energy and maintenance costs,” Wendzel says. “The efficient frozen storage of our drive-in rack has been key in helping us to expand, cut costs and improve safety while consolidating our facilities.”

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exchange of information throughout a given project. Boston emphasizes the importance of visualizing the application, not merely the size, shape and location of storage.

“If I don’t know what the purpose and mission of a storage system are, it’s hard to match it with expectations,” Boston says. “If the goal is minimal rack material and standard usage for five to seven years, I will design it much differently than if the system will need maximum usage for 30 years. In addition to knowing we need 500 pallet locations for 2,000-pound pallets, we should consider if it is an archival application or will be accessed very often with people and equipment working around it all day long.”

The increased use of automation also demands more collaboration between solution providers. Rogers says automation typically requires precision in rack design, with tolerances much finer than conventional systems. As an added bonus, Rogers says automated systems often improve seismic resistance by creating a denser cube structure instead of a series of independent aisles.

For example, one customer project in Bakersfield, Calif., was located right on a fault line. Rogers says the customer had planned to pour a 10-inch, fully reinforced slab. Instead, after a holistic assessment of the system, the customer ended up needing only an 8-inch, regular-reinforced slab.

“The math worked out in a way that was more efficient than guesswork or adjustments after the fact,” Rogers says. “Customers are doing a much better job of getting suppliers, integrators and consultants involved from the get-go. But we still get calls from people who want rack next week, where probably not much thought went into that.”

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No longer a static, 30-year fixture, rack systems should be ready to change along with the application.
Balancing density and accessibility
In the case of retrofits, most are characterized by increased diversity of storage media tailored to various SKU and order profiles. Krummell says about 90% of his business has historically been deep storage pallet rack. “We’re seeing now that the customers of our customers are demanding they change how they distribute,” Krummell says. “They want pallets split up, and some orders are individual cases or even eaches.”

One customer using aged density pushback rack sought to ship to stores while reducing held inventory. “They had been trying to pick eaches out of high-density pushback,” Krummell recalls. “Pushback doesn’t support case picking very well, or each picking at all.” The customer reconfigured the existing rack to include storage for pallets, high-density case storage, carton flow and shelving for each picks. The changes resulted in a 30% increase in productivity.

Ed Granger, director of sales for Quantum Storage Systems, says the trend of each picking, combined with lean methodologies in production applications, has led to an “explosion” in wire shelving business. “It’s blown our historical averages out of the water,” Granger says. “We still have customers that might spend six figures and then we don’t hear from them for years, but nearly one in five customers comes back monthly or weekly to make adjustments.”

As these companies reform storage space, the surrounding processes inform shelving systems, Granger says. “We’re seeing lots of product on wheels, since the mobility factor for these companies is huge,” he says. “They are focused on achieving speed and growth.”

The landscape changes by the minute, it seems, and storage systems have had to adapt more rapidly in recent years than in previous decades. Rack technology moves a lot slower than other parts of industry like software and automation, but Boston says he welcomes the new challenges.

“Some might say it’s not like the good old days, but I really like where things are going. These are the good days,” Boston says. “I haven’t seen it going any better than this.”

**Companies mentioned in this article**
- Advance Storage Products
- AK Materials Handling
- Hannibal Industries
- Quantum Storage Systems
- Ridg-U-Rak
- Steel King

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between each connected device, from servers to automation components to cell phones, lies a potential cybersecurity risk. The industry could be forgiven for prioritizing performance over impenetrability as it scrambles to adopt technology, but industry experts suggest risk exposure is too often an afterthought. Whether malicious or accidental, internal, external or due to natural disasters, cybersecurity breaches can have a massive impact on operations that are dependent on connected systems.

“The digital revolution has decentralized industrial data and knowledge,” says Mark Stevens, vice president of global services for Digital Guardian, which specializes in data protection platforms. “In the old days, everything was centralized and you had to physically go to the file cabinet in an office. Devices can make people more productive in all areas, but that makes it really challenging for security professionals when everyone now has that file cabinet in their pocket.”

Although hacking and high-profile breaches make headlines, not all cybersecurity risks are malicious or even intentional. In fact, Jason Royes, senior security consultant for Cisco Security Solutions group, says it is impossible to attain 100% security.

“The adoption of mobile solutions and the emerging Internet of Things certainly complicates things,” Royes says. “The goal, then, is to remediate risks and raise the bar as much as possible. All the hopes for growth in most industries are tied to technology and
Digital connections are spreading throughout the industry, enabling mobile, automated and real-time processes. But when opportunity overshadows security risks, new technologies can increase your exposure.

more connectedness. They can’t resist it, but they have to be smart about it.”

To that end, solution providers and end-users have been revisiting the pre-Internet network security concept of AAA, which calls for authentication, authorization and accounting at each access point. If no solution is perfect, the accounting function in particular can help capture the details of a breach and help prevent another in the future.

Interestingly, although the proliferation of devices, automation and connections adds substantial risk, it is also the industry’s best hope for a new security paradigm. Virtualization of operational data can create redundancy and enable quick response to a brownout or flood, and cloud-based security software means companies of any size can benefit from the most sophisticated solutions available.

The best defense is a good offensive team
New solutions are more powerful by the day, but Tony Baker, product manager for network security at Rockwell Automation, emphasizes that security products only get you so far.

“We used to be in the age of point solutions, where you might apply some software every now and then and you’re in good shape. That’s no longer the case,” Baker says. “You can’t just install a new firewall every six months. Products without services don’t make sense anymore, so companies should be thinking about programs, not projects.”

The point solutions of old used to resemble concentric rings, with the crown jewels in the central vault, guards outside the door, castle walls and a moat. The contents of the vault were the usual suspects: intellectual property, pricing data, customer information and the like. But when your castle has Wi-Fi, a guard brings his own cell phone to work, and there’s a sale on moat-width planks, the spaces between each ring become a free-for-all.

In this environment, well-meaning employees can be as disruptive as any Trojan horse. Baker offers the example of a facility with two production lines. One was taken out of commission for service, and a technician set out to update its programming. After mistakenly downloading the program to the active line, production came to a halt. He was authorized, if not authenticated, for the specific task and the
accounting function offered a record of the preventable problem.

Given the emphasis on lean, real-time operations, that record will likely reflect the huge cost of downtime for production and the entire organization. Companies continue to pursue tight connectivity between the enterprise layer, an enterprise resource planning (ERP) system, supply chain management (SCM), a manufacturing resource planning (MRP) system, and forecasts, all the way down to the operations level for automation and production. Tightening security to create fortresses around each connection can seem overwhelming, but it’s no longer just a single person’s job.

“It’s not a technological gap, it’s a cultural one,” Baker says. “Information technology folks and operations folks need to be in the same room and aligned around business objectives, not individual objectives. Customers who do that have the most success, and they have almost created a single business as manufacturing IT folks report to the same place as enterprise IT.”

Baker also suggests IT security experts should shift their thinking from exclusive to inclusive. “Some IT folks feel more secure if they keep personal devices and other data hubs separated,” he says. “I would argue that you actually have more control if everything is included under the same umbrella so there are no surprises. Or if there are, you will have the benefit of your accounting practices to monitor what people do in your network.”

Protecting links in the exposure chain
Most industries are playing catch up, Baker says. So many devices are connected to various systems, and there’s not always a good understanding of what they are, what versions of software they’re running and what version of firmware is installed. Even with tight control of its own equipment, a company that does electronic business with any other company assumes some of that entity’s risk.

“You can’t make any assumptions about how a third party will handle and protect data and information,” Royes says. “From a security standpoint, you have to treat them as untrusted, for lack of a better word.”

Once again, these types of connections might divide security specialists, some of whom prefer distance and some of whom prefer to keep their friends close for added visibility into their mutual cyber-enemies. In either case, security is a shared responsibility in the supply chain.

Manufacturer shores up data security practices worldwide
Jabil is a global manufacturing services company with almost 200,000 employees and $20 billion in revenue. After deploying a modernized security solution to more than 40,000 users in less than 120 days, the company replaced its legacy, perimeter-based approach to security and gained granular visibility into sensitive data access.

The company uses multiple cloud-based platforms at the enterprise level and management was comfortable with the risks associated with using the cloud. But as a team began investigating data security practices, it found shortcomings around data classification and control.

“When we thought about what we needed to protect, we realized it could be anything,” says Michael Ring, information technology security architect at Jabil. “We had a lot of devices and a lot of end points and they were all at this low level of perimeter-based security. The ‘one size fits all’ centralized control mindset just wasn’t working.”

The team wanted to instead use a tiered control set (Digital Guardian, digitalguardian.com) that could establish a baseline level of security to meet each customer’s policies. The system was also designed with some higher levels of control that gave more security around those assets and for employees who were interacting with critical data like intellectual property, pricing data, personally identifiable information, tool sets, molds, customer plans and CAD drawings.

Team members experimented with machines owned by family and friends to make sure that the agents were generally stable. Real-world deployment ramped up quickly, Ring says, and within months the solutions were installed on corporate machines worldwide.

“With the immediate visibility, we saw things like data being copied to USB drives. That was a real eye-opener,” Ring recalls. “No one really thought we had a data leakage problem, but if you are not running a data loss prevention solution (DLP) you probably have that problem right now.”

The company now enjoys visibility into which process are active and the files being opened, which creates a pattern that helps identify a hacker in the network or on an end point. The security tools ensure the behavior matches normal usage.
At the opposite end of the spectrum of supply chain risk is the individual semiconductor, where ones and zeros bounce from one electronic circuit to the next. Because they are virtually everywhere, even an uninterruptible power supply (UPS) presents a potential vulnerability.

“Most people’s approach to security is to build a hard shell around things, but they have a soft center with vulnerable controls,” says Robert Bergman, co-founder and vice president of sales and business development for Bedrock Automation, a member of the Control System Integrators Association. “Instead, a hard center could include encrypted microcontrollers at the core of every module, from each I/O to the power supply.”

The NSA, keenly aware of cybersecurity, recently granted the highest security rating to a new UPS. “I’m not aware of any other UPS that has any kind of security, much less something capable of managing government missile data,” Bergman says. Although it might sound analogous to building a bullet-proof smart phone charger, Bergman emphasizes that no gap is too small to overlook.

It’s important that every last component is secure, but the traditional concept of concentric rings still has value. In fact, in terms of deliberate attacks, the outermost perimeter of a company’s security posture is still one of the most important layers.

“Five years ago, it was all about the insider, the Edward Snowden. Now it’s all about outsider,” Stevens says. “Cyberthreats are trying to get into the system, get credentials and become a user.”

Generally, the greater the value of sensitive information, the greater the attacker’s effort, but many hackers are simply canvassing for easy victims. It’s relatively easy to put together a million-dollar unlawful operation to go after data, Stevens suggests, and data theft is a lucrative industry. “But those people are also looking for the low-hanging fruit,” he says. “A thief will knock on the door, and if the security is robust, they will move along and knock on the next door.”

Natural disasters
Floods, earthquakes, power outages and political unrest are rarely so passive, and there’s nothing virtual about the destruction of physical assets. However, comprehensive operational data at the controller, facility and network level can ease recovery.

“A best practice is to always use a sort of industrial demilitarized zone between the enterprise layer and the plant floor,” Baker says. “You never pass sensitive data from the floor to the ERP without passing through that DMZ, so if the ERP goes down, your production doesn’t. You might not get real-time data for KPIs, but you’re not stopping production.”

If a plant or supplier are offline because of a natural disaster, visibility at the ERP level and the overall supply chain make it possible to react very quickly. If there is already an approved secondary supplier, Baker says, weeks of response can be reduced to hours. Frequent backups of controller programs can also help recreate identical operations elsewhere, or when the site comes back online.

“If a hurricane hits the manufacturing platform, lots of other systems are affected, and all of those components need to be brought back up,” Baker says. “Real-time systems help retain the state of operations at the time of shut down, and might even indicate the single point of failure that brought the whole system down in the first place.”

More mobile infrastructure directly translates to agility when disaster strikes, Royes agrees. All the same, the fact remains that more technology and more vulnerability go hand in hand. At least for now.

Companies mentioned in this article
- Bedrock Automation
- Cisco Security Solutions
- Digital Guardian
- Rockwell Automation
WMS vendors have integrated key “execution” apps like LMS, slotting and TMS with their core systems, creating platforms for execution. The latest generation of these platforms also may weave in distributed order management, supply chain planning and demand management while building in flexibility for rapidly shifting fulfillment requirements.

By Roberto Michel, Editor at Large

Just when it seemed providers of supply chain execution (SCE) software had stitched together key SCE applications into tidy suites centered on warehouse management system (WMS) software, some new wrinkles may be appearing in the concept of an SCE platform.

The wrinkles are in the form of integration requirements for the increasingly important component of distributed order management (DOM), as well as upstream planning applications that could provide an advantage if they can link seamlessly with the “execution” apps normally found in a SCE suite.

The good news, say SCE software providers, is that through new forms of integration as well as long-standing efforts to build consistent data models for applications, users can bring applications like DOM into the SCE fold. At issue is the ability of a vendor’s platform to gel with more applications as well as the overall ability of the platform to adapt to business change.

SCE suites grew out of the WMS market, but over the years, major vendors expanded their offerings to include other logistics execution applications such as slotting, labor management system (LMS), yard management system (YMS) and transportation management system (TMS) software. The result has been SCE product suites.

The key benefit of having SCE apps pre-integrated under a platform, says Joe Vernon, senior manager of North America supply chain technologies for Capgemini, is that WMS users can add more solutions without having to worry about whether they’ll fit together, roughly akin to how automakers leverage one “platform” for different models.

“The platform idea started in Detroit, where you could design one chassis and use it to build different cars or even a light truck,” says Vernon. “Similarly, at the WMS level, WMS may need to connect to labor management and to yard management, and then to slotting. So you have this aggregate of components that need to come together under a platform and create an advantage when used together. That is the essence of a platform—having components come together easily to create an advantage for the user.”

The distinct SCE applications often share some of the same master data, such as what is a customer or what is a stock keeping unit location. Integration is easier when SCE applications have the same understanding of these core “business objects.” Vendors tend to approach integration in slightly different ways, but the aim is to get all of SCE’s more traditional apps—and the newer ones like DOM—fitting together nicely without much integration work.
Consistency counts

A persistent issue when it comes to SCE platforms is how tightly linked the applications should be. Rishi Raina, principal for supply chain technologies with Capgemini, notes that most major SCE vendors have acquired solutions over the years, and while some have built tighter integration, others use middleware with prebuilt “adapters” to more loosely link applications.

Both Raina and Vernon see a growing market interest in having DOM software capable of dealing with multi-channel fulfillment. “All of these pieces really need to fit together to enable a holistic supply chain execution platform,” says Raina.

Manhattan Associates has offered an integrated “process platform” for years and has the advantage of not having acquired solutions for many years, says Chris Clark, Manhattan’s director of technical product strategy. The applications share common business logic for elements such as purchase orders (PO), including details like header information and PO line information, which makes it easy for the applications to work together in an integration fashion, including Manhattan’s DOM solution, he adds.

“We don’t have to do data transformation,” says Clark. “Transformations can be error prone, they take time, and they take capacity in the system. We’ve taken a holistic approach to our data model and designed one model that applies to the entire set of products that sit on the platform.”

End user companies that have committed to Manhattan’s platform approach include food distributor and retailer Giant Eagle, which uses Manhattan’s WMS and LMS at multiple distribution centers as well as a solution for supply chain traceability. In Giant Eagle’s case, the combination of LMS with WMS proved beneficial, gaining an 8% to 10% labor productivity improvement at its health and beauty products DC, and a 3% to 5% increase at other DCs.

Users pick and choose which applications they want to plug into the platform to meet their priorities without worrying about integration burdens, says Clark, which leads to a more effective supply chain. “We find that with some customers, they want to use only one or two key applications, but others want to use...
multiple applications and have them work well together,” he says. “So the benefits of the platform really start to bear fruit when you’re dealing with multiple products on the platform.”

**Fresh ESB approach**

Since JDA’s merger with SCE vendor RedPrairie in late 2012, JDA’s integration strategy has looked at ways to tie its supply and demand planning solutions with the SCE suite. Now that strategy is moving forward under its “Intelligent Fulfillment” offering, which links planning with execution, says Fab Brasca, vice president of global logistics for JDA.

For example, says Brasca, managers using WMS and labor management would have visibility into promotion plans being developed at the corporate level. “With this better visibility into what’s coming, they can better plan their labor requirements, capacity or re-examine slotting,” says Brasca. The integration also works the other way around, so that demand-planning users see the execution constraints.

Underpinning JDA’s integration strategy is a new set of middleware capabilities built under an enterprise service bus (ESB) foundation, according to John Sarvari, group vice president of technology for JDA. This is not an older ESB concept, but rather a fresh one that takes the approach of smart adapters that exposes application functions or “services” in a standard way to other applications.

The middleware takes a “smart end point; dumb pipe” approach, says Sarvari, which means that the integration complexity lives inside the adapter where it doesn’t have to be tweaked by users every time one solution gets upgraded. “We are presenting a consistent representation of business objects that exist across solutions,” says Sarvari. “The real benefit of doing this is the flexibility.”

The ESB strategy is set to be highlighted this spring at JDA’s user conference and will be the integration layer for the vendor’s 9.0 Intelligent Fulfillment release. It also will be used to facilitate the integration needed for a key product alliance JDA announced late last year with IBM’s Sterling unit, which pairs IBM’s DOM software with JDA’s SCE applications.

Within each “solution domain” such as the SCE suite, JDA has distinct platform architecture, but going forward, says Sarvari, ESB with smart adapters will be the means of efficient integration between solution domains and third-party solutions. It’s a break from older middleware approaches, he says, achieving true orchestration of services. “Old world thinking was to use [middleware] to throw information over the wall ... whereas now, we really want to interrogate the source system of information and get a response back,” he says.

Newer middleware that uses a “publish and subscribe” method of integration and standard formats can help reduce integration costs from one application to others that need to communicate with it.
Consistent experience
At HighJump, which merged with Accellos last summer, the SCE product lines from each side are continuing as separate solutions sets, each with its respective architecture, says Chuck Fuerst, director of product strategy at HighJump. The reason is that each SCE suite tends to appeal to a different market segment, with the software from the Accellos side focused on smaller- and medium-sized companies, while HighJump’s software traditionally appealed to somewhat larger mid-sized companies or larger enterprises.

The HighJump WMS also has more extensive adaptability tools, so it tends to appeal to organizations that want to tweak the SCE suite to their needs. Given these differences, says Fuerst, it didn’t make sense to create a single architecture and try to migrate everyone to it.

Instead, the focus has been on what Fuerst calls creating a “common user experience,” meaning that factors like licensing, log-on and security, user interface (UI) style, and business intelligence (BI) tools, will become common between the product lines. “Users will have a common experience, regardless of which product you are using,” says Fuerst.

Some solutions will be integrated to work with either product suite, adds Fuerst. The first one of these is supply chain analytics. The current WMS versions still look different, says Fuerst, but over time, will gain a common look and feel.

Short term, adds Fuerst, the focus has been on commonality in factors like licensing, log-on routines, and security and administrative mechanisms. “If it feels clunky and you have different security measures between applications, that tends to erode user productivity, so we are focusing on providing a seamless experience for customers,” he says.

Where SCE users inevitably face an integration hurdle is in linking to enterprise resource planning (ERP) systems, says Vishal Minocha, Infor’s senior global product manager for SCE. As a vendor of an SCE suite as well as multiple ERP suites, Infor offers its own middleware called ION to integrate SCE with ERP solutions, whether it is an Infor ERP solution or one from another ERP vendor.

The middleware exchanges information between ERP and SCE in an XML format called a Business Object Document (BOD) established by the Open Applications Group, a software
industry standards group, says Minocha. The BODs, as well as the “publish and subscribe” style of exchange used by ION, he adds, makes it possible to achieve a loosely coupled integration to ERP “so that if you upgrade ERP, but not your supply chain execution, or vice versa, your integration is not going to break.”

Within the SCE realm, however, Minocha says there is value in going with a vendor who can offer a more tightly integrated, unified set of applications. A unified SCE suite allows tighter shared processes, he adds.

For example, a unified SCE suite with slotting that ties into WMS and labor management would let the user company to run a reslotting calculation and immediately see the labor resources needed to carry out the reslotting, while the WMS would be able to intersperse the slotting related moves with normal fulfillment tasks. “Having a unified suite streamlines processes,” Minocha says. “It’s like the simplicity you get with a smart phone in being carry out multiple key functions—voice calls, e-mail, texting, camera, Web use—on one device, rather than switching between devices.”

**Beyond integration**

While linking applications is an important, a SCE vendor should really offer more in a platform than integration, says Robert Colosino, vice president of marketing and business development with TECSYS. “Integration is just the meat and potatoes part of having an effective applications suite,” Colosino says. “A modern supply chain platform needs to allow users to easily execute, adapt, scale and expand to meet today’s rapidly shifting business priorities.”

Smart phone use, e-commerce, omni-channel and other trends are impacting SCE software users in multiple ways, says Colosino. They may need easy adaptation of user screens, including the ability to insert visual cues to aid speed and accuracy, is seen by some SCE vendors as part of what a platform enables. To scale WMS down to the store level or stock room level to fill orders closer to customers. Or, more e-commerce fulfillment might be adding so many more SKUs to the mix such that pickers need visual cues within their UIs to be more accurate and productive.

TECSYS’ platform accomplishes these needs by being easily adaptable by end users without programming. For example, users can quickly add pictures of items to screens in the WMS to avoid picking errors for items that look very similar, says Colosino. Or, users may want to quickly configure a new workflow to institute a returns-processing or quality-assurance procedure.

Colosino also sees integrated DOM as an important option, but DOM workflows, and indeed, all SCE application workflows, must be easy to change. As he sums up, “The important part of a platform increasingly is the ability to quickly adapt and change with the business environment, to create new workflows, and scale solutions up or down.”

**Companies mentioned in this article**

- Capgemini
- Highjump
- Infor
- JDA
- Manhattan Associates
- TECSYS
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Food bank rewards volunteers with “pleasant” environment

Fabric curtain walls separate workers from temperature, noise and equipment traffic.

The Second Harvest Food Bank of Clark, Champaign and Logan Counties in Ohio is a not-for-profit clearinghouse that collects, stores and distributes dry and frozen surplus food. To improve working conditions for volunteers, the company installed a fabric curtain wall that reduced noise and temperature variations in the warehouse.

Since 2001, the food bank’s volunteers have worked out of the organization’s 58,000-square-foot food storage facility alongside lift trucks, pallets, refrigeration units and trucks coming in and out with food. Last year, the food bank sourced more than six million pounds of food to the 90 soup kitchens, shelters and pantries it serves in western Ohio.

Volunteers endured loud noises and cold gusts from freezers and coolers, a problem worsened by the addition of a new cooler and a 40% expansion of the freezer space. Keith Williamson, executive director for Second Harvest in Springfield, wanted to establish a separate area for volunteers.

“I quickly learned that these curtain walls would be able to define and beautify the volunteer center work space, provide temperature separation, and buffer loud noises coming from the warehouse area,” Williamson says. “Before we put the curtain walls up, you were almost yelling to the volunteers just so they could hear you. Now, the environment is much more pleasant.”

The new curtain walls (Zoneworks by Rite-Hite, ritehite.com) are temporary walls constructed of fire-retardant industrial vinyl that is wrapped around anti-microbial polyester batting. The insulated walls can provide up to 40 degrees of temperature separation from one space to another and can reduce noise levels by up to 25 decibels. Three custom vinyl-strip doorways framed in the wall allow for easy access to the storage area—one for foot traffic and two for pallet jacks or forklifts.

“We really enjoy the temperature control, and we noticed the misting fan and box fan ran much less frequently last summer,” Williamson says. “It gets really hot here, and when your workers are volunteers, it is crucial to provide a hospitable work area.”
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Medical distributor **more than doubles anticipated ROI**

Voice-directed picking spreads like wildfire through the distribution network, improving productivity by 25%.

Seneca Medical provides medical surgical product distribution and supply chain services to healthcare providers for DCs in Indiana, Michigan, North Carolina, Ohio, Tennessee and West Virginia. After gradually rolling out voice-directed case picking workflows in its six DCs, the company has achieved 99.9% accuracy, 25% productivity improvement and $1 million in cost savings.

Prior to the voice deployment, the company used paper-based processes for piece-picking and bulk picking. On the piece-picking side, eaches are placed into totes bound for a hospital department. For bulk, pickers move cases to pallets bound for a hospital storeroom before the hospital distributes items internally.

Beginning in piece-picking, the company deployed voice solutions (Vocollect by Honeywell, vocollectvoice.com) and partnered with experts in voice-directed process optimization (Speech Interface Design, speech-interface.com) to develop a system it gradually phased into operations workflow by workflow.

Even with the greater variation common to bulk picking, the solution produced rapid returns there as well, according to Keith Price, vice president of information services for Seneca Medical. After successes in the first DC, Seneca introduced the technology to its remaining DCs.

“We aimed for only a 10% productivity increase to get a return on investment in about 10 months,” he says. “That was our justification, but right off the bat we started seeing a 15% productivity improvement in lines picked per hour, and some locations were up as much as 25%.”

Included in these figures is the savings from improved quality control. The facilities handle a number of items that look similar, but had enjoyed high accuracy rates for some time before voice thanks to veteran staff members and a double-checking process. In fact, accuracy improvements were not even factored into the planned ROI.

“Now we don’t double check anything anymore,” Price says. “Of 140,000 lines piece-picked in the largest warehouse, there are 10 to 15 errors per month, down from 30 to 40. If you follow the procedure, it’s really difficult to pick the wrong item.”

When considering potential incentive benefits for pickers, officers had targeted 55 lines per hour for piece picking and 35 or 40 on the bulk side. “Almost all our locations are hitting that, and some are as high as 90 to 100,” Price says. “Whereas back on paper the absolute fastest was 75 to 80.”
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As the warehouse and distribution center become more and more complex, and as transaction volumes rise, the need for automated technology that can effectively and efficiently manage skyrocketing volumes and roller coaster customer demands has increased exponentially.

To help fill those gaps, hardware and software manufacturers are turning to a range of equipment and software to gain efficiencies and meet the growing demands of their customers.

As automatic data collection (ADC) technologies become affordable and ruggedized, a wider swath of logistics operations are turning to a range of equipment and software to gain efficiencies and meet the growing demands of their customers.

By Bridget McCrea, Contributing Editor
In today’s competitive world, retailers must be able to deliver the right orders to the right customers at the right time. Errors and delays in order fulfillment can have lasting negative impacts on your brand, while maintaining high stock levels can tie up capital and limit flexibility.

As a full service partner of automated material handling solutions, Swisslog enables you to achieve the highest throughput at the lowest cost, efficiently handle large SKU ranges and accurately meet delivery demands and requirements.

*Warehouse Automation – Design, Develop and Deliver.*
facturers in the automatic data collection (ADC) space have been introducing newer and more affordable ways for operations of all sizes to roll out automatic solutions within the four walls of their warehouses and DCs.

By definition, automatic identification (Auto-ID) and ADC technologies comprise the voice systems, radio frequency identification (RFID), optical character recognition (OCR), radio frequency (RF) terminals, vehicle-mounted computers, and other tools that work independently or in tandem to automate warehouse and DC activities. An unmanned forklift that buzzes around a warehouse moving pallets and delivering goods to dock doors, for example, represents a convergence of both ADC and robotics.

“It’s all about being able to pick faster, pack faster, ship faster, and receive faster by enhancing the warehouse’s levels of automation,” says Michael Liard, an independent analyst and ADC expert. He points to Amazon’s 2012 acquisition of mobile robotic fulfillment systems’ manufacturer Kiva as one example of how retailers are focusing on increased automation in the warehouse. “By bringing unmanned vehicles and robotics into the fold, employees and labor can be assigned to different tasks other than searching for and locating products.”

In addition to the growing number of unmanned robots that are zipping around today’s warehouses, Liard is also seeing more fixed-position bar code scanners and bar code imagers being used on conveyor belts and other pieces of warehouse management equipment.

Used to automatically track and orchestrate shipping and receiving activities, these scanners and imagers are helping logistics operations achieve faster throughput and improved scan times with less worry over bar code-scanner orientation. Add 2D symbologies and 1D bar codes to the equation (QR codes), and the potential for business process improvements increases exponentially, according to Liard.

Over the next few pages we’ll explore the increased use of ADC technologies in warehouse and DC operations across the U.S., find out what types of hardware and software are being used to increase throughput and speed delivery times, and explore some of the newer ADC innovations that are on the horizon.

**Key ADC drivers**

According to David Krebs, executive vice president of enterprise mobility and connected devices for VDC Research, the ADC market is largely being driven by new and emerging compliance requirements.

“Be it vendor and partner compliance, government compliance, or industry compliance, these forces are all key drivers for this industry,” says Krebs. In addition, he says that the ADC technologies themselves are evolving, and with these changes come new opportunities that affect business operations. “Moreover, in today’s age of Big Data and analytics, ADC plays a central role as a conduit of that data,” says Krebs. “Consequently we’re seeing even greater emphasis on end-to-end visibility and traceability.”

In addition, Krebs says that new business models such as omni-channel fulfillment are emerging to better address the needs of today’s consumer. “The impact on data collection technology is great as the operational focus shifts from pallet shipments to filling the ‘perfect order,’” says Krebs.

And while bar code technology remains the primary emphasis when it comes to data collection solutions, Krebs adds that VDC is also seeing greater adoption of other solutions such as RFID—especially in the apparel sector—and Bluetooth low-energy (BLE) solutions from vendors like iBeacon.

“However, most of these investments are focused less in the warehouse and more in retail or customer-facing environments.”

While in the past ADC technology investments have been concentrated among large enterprises, Krebs says that, currently, the small to mid-sized business segment accounts for approximately 15% to 20% of demand within the space. “A focus on modernizing logistics infrastructure is driving demand for ADC solutions as next generation warehouses are developed at all levels,” says Krebs.

On a sector-by-sector basis, Krebs says that the largest portion of demand for ADC is concentrated among retail, transportation and logistics, and manufacturing organizations. “ADC technology is now ubiquitous, especially in core manufacturing, logistics, transportation and retail sectors,” Krebs notes, adding that primary uses for such technology include inventory management, shipping, and receiving automation, point of sale scanning/checkout, and work-in-progress tracking.

From a technology perspective, Krebs has picked up on a continued shift from laser data collection solutions to imaging technology. “While more pronounced in the more mature regional and country markets, the trend toward imaging extends in virtually every application environment includ-
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According to Krebs, imaging technology has overcome prior functionality limitations and provides end users with greater application functionality in the long term. The same trend is also making an impact on stationary scanning applications such as point of sale and over-the-belt scanners.

**ADC for the masses**

As he surveys the current ADC space, Liard says he sees healthy adoption levels across the board thanks not only to the new innovations that are being introduced, but also to the fact that many of the options have become more affordable.

This affordability has put ADC within closer reach to smaller firms that in the past were tied to their clipboard/pen/radio approach to warehouse and DC management. “Just looking specifically at ADC hardware, and whether it’s scanning technology, bar code printers, or something else, the equipment itself is more affordable and durable,” says Liard.

This improved “ruggedness,” says Liard, has become particularly poignant for today’s logistics operations looking to increase speed on the floor. “The ‘ruggedization’ requirements in the warehouse and logistics space has certainly grown over the last few years, and we’ve seen the vendor community respond accordingly,” he says.

Also helping to buoy the use of automation in the facilities is the proliferation of consumer handheld devices like smart phones and tablets, both of which can now be used in conjunction with “sleds” or other apparatus that make even the most fragile devices more rugged.

“Employees are being armed with consumer-grade devices that most of them are already comfortable using in their personal lives,” says Liard. “You can take an iPhone or an Android tablet, for example, put it into a ruggedized sled, and then use it in a harsh environment like a warehouse or DC. That device can then be used a similar way to more traditional ADC technologies.”

Krebs says that VDC is also closely tracking the increased use of mobile scanning in the warehouse and the DC. “The impact of consumer technology here is great, with organizations looking to leverage ubiquitous smart phones and tablets, especially in the retail sector,” he says. “Software solutions are emerging that turn embedded cameras into more powerful scanners. In addition the ecosystem of third-party scanning peripherals—like sleds and Bluetooth scanners—is only growing.”

Within the four walls, bar code scanners and imagers are also being attached to forklifts and other vehicles in an effort to attain higher levels of automation. “It’s not just workers walking around the DC with their key-ring scanners, mobile computers, or bar code scanners,” says Liard, “but also automated vehicles—some of them manned—equipped with camera-based imagers and long-range bar code laser scanners.”

In the latter scenario, Liard adds that ADC equipment can read at long distances and top-rack heights—and even those 2D symbologies that might be hanging from the ceiling on a placard.

**Ahead for ADC**

Ultimately, Liard says that advances in ADC support better return on investment, lower total cost of ownership, and better price points on the equipment and software itself. So, whether a logistics operation invests in a full-blown, robotic solution or simply purchases a few dozen ruggedized sleds to accommodate employees’ existing mobile devices, the road to the completely automated warehouse and DC is getting shorter and shorter every year.

And while interest in ADC-related technologies is clearly on the rise, the rate of adoption remains slow but steady. From a mobile device perspective, for example, Krebs says that rugged “brick-styled” devices with full keyboards remain the norm in the warehouse.

“Rugged handheld OEMs are investing more in touch-only devices,” Krebs notes, “which will be popular in logistics and retail environments.” Specifically within the warehouse, he expects continued demand for more traditional keyboard-centric devices, most of which run either Windows Mobile 6.x or embedded CE operating systems.

“With Microsoft discontinuing support for these platforms, we’re seeing a lot of evaluation of alternative solutions among end users, especially Android,” Krebs adds. “Rugged Android adoption is still in its infancy with enterprises concerned about security and manageability. However, these solutions are maturing and we are seeing organizations become more open to this platform.”

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Integrate, centralize multiple loading dock device controls
By integrating the controls of multiple loading dock devices into a centralized, easy-to-operate system, the Dok-Commander enhances safety and security of personnel and products. The unit installs at each dock position and powers a vehicle restraint, leveler, door and light. Three interlock functions ensure equipment is engaged in the proper sequence. The first disables the use of a hydraulic leveler or overhead door until the vehicle restraint has safely engaged. The second requires the overhead door to be opened prior to leveler operation, and the third ensures the leveler is stored before the restraint can release the trailer. Engineered for heavy-duty use in harsh environments, the system meets requirements for noise, electrical and environmental conditions and chemicals. It can also be linked to an active building security system to prevent cargo theft. Rite-Hite, 800-456-0600, www.ritehite.com.

System manages yard, dock operations
Using real-time and physical data, the 4SIGHT yard and dock management system helps facilities efficiently manage operations including loading dock visibility, live and staged trailer coordination, and turn time management. The system quickly integrates equipment with intelligent software to monitor, communicate and manage dock status. Featuring a simple, easy-to-use interface, the system combines information from RFID, GPS and other sensor technologies to provide real-time yard and loading dock visibility, full automation and optimization from the time a vehicle approaches the inbound gate to the time it exits the outbound gate. It also provides maintenance scheduling based on actual usage, sending an automated e-mail to service providers and maintenance personnel with notifications about affected dock doors requiring service. ASSA ABLOY Entrance Systems, 866-691-1377, www.4sightsolution.com.

Surface mount dock lift requires no pit
With a lowered height of 5 inches and fully raised height of 58 inches, the hydraulic-powered SMDDL surface mount dock lift provides access to loads on truck beds at any height, then transfers them to a fixed-height loading dock or to grade level. A built-in, 30-inch ramp creates a gentle 9-degree slope for pallet jack accessibility, while a diamond tread surface on the deck, bridge plate and access ramp offers excellent traction. For stability, the lifts feature an extra wide base and plate rollers, allowing them to handle loads up to 6,000 pounds. Heavy tubular legs and cross members minimize deflection and offer level handling of off-center loads. The lifts may be specified in platform sizes of 6 x 6 feet or 6 x 8 feet. Because they do not require a pit, they are ideal for leased or temporary buildings. Southworth Products, 207-878-0700, www.southworthproducts.com.

Protective gates guard against falls at open dock doors
Offered in two configurations and four opening sizes, EdgeGard dock gates increase loading dock safety. The low-profile Folding-Rail version protects wider openings than traditional dock gates and minimizes the required overhead gate clearance height. The Straight-Rail dock gate is for heavy-duty, standard overhead height applications. Easy to install and operate, the gates provide an effective barrier for equipment and personnel working near truck loading pits, open dock doors or other hazardous areas. The gates have been tested to withstand the 200-pound OSHA load force protection requirement, and feature black safety striping and a durable bright yellow polyurethane paint finish for visibility. When closed, the gates sit 42 inches above floor level. Wildeck, 800-325-6939, www.wildeck.com.

Recessed dock lifts handle up to 12,000 pounds
The 3400 series recessed dock lifts handle pallet jacks, powered pallet jacks, straddle stackers and small fork trucks. Covered by a two-year parts and labor warranty and a 10-year structural warranty, the lifts handle a maximum load of 12,000 pounds. Features include a 5 horsepower motor that raises and lowers the 6 x 10-foot platform at a rate of 7 feet per minute; a baked enamel finish for durability; and a hinged bridge with pull back chain. The lift travels 58 inches from a lowered height of 15 inches. Advance Lifts, 800-843-3625, www.advancelifts.com.
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Prevent trailer drive-away during loading, unloading

By interlocking a trailer’s air brakes with the dock door, the Salvo loading dock safety system prevents the accidental drive-away of a vehicle during loading or unloading. The system eliminates human error, prevents falls, secures dock doors and provides workers with complete control over their environment. When a vehicle arrives, the heavy-duty, stainless steel and aluminum lock is applied to the trailer brake line, releasing a key coded to unlock the assigned dock door. While the door is open, the key is trapped; it is only released when the dock door is closed. Easy to install and maintain, the device can be customized to any dock. Castell Interlocks, 312-350-1516, www.castell.com/us.

Non-compression dock seal reduces building load wear

Engineered with a patented hollow foam core, the U-Seal non-compression dock seal reduces building load and wear and tear on the dock seal face. Its U-shaped polyurethane foam features an inner and outer foam finger that folds and conforms to various trailer types. When engaged within the trailer, the seal minimizes the footprint within the impact zone of the forklift and pallet loading area. Features include 40-ounce vinyl used throughout all surfaces, including a secondary wear face for added durability in the contact zone, and triple layer reinforced corners. All wear surfaces are replaceable as needed. DL Manufacturing, 866-235-7468, www.dlmanufacturing.com.

Rent a yard ramp for short-term use

The supplier now offers yard ramps for lease from multiple locations in the United States, lowering delivery costs and meeting the need for short-term yard ramp usage. Ramps may be leased for any period of time, from one week to one year (or longer). A full range of sizes and capacities are stocked to facilitate the loading and unloading of semi-trailer trucks at locations that lack a loading dock. Alternatively, the ramps can be used to allow vehicles to enter a warehouse through a loading dock door. Handi-Ramp, 800-876-7267, www.handiramp.com.

Forklift cutouts simplify dock board’s placement, retrieval

With fork cutouts incorporated on its leading edge, the Speedy Board dock board simplifies placement and retrieval. The openings allow a forklift operator to quickly and safely scoop up the board and move it into place without exiting the vehicle. No loops, lifting chains or other personnel are required. The boards come in widths from 18 to 84 inches, lengths from 30 to 84 inches and in two grades: 14% and 19%. Some models are stocked for immediate shipment. Bluff Manufacturing, 800-433-2212, www.bluffmanufacturing.com.
**Focus on Dock Equipment**

**Store dock leveler in vertical position to save space**

The VL vertical storing dock leveler parks in an upright position, allowing trailers to back firmly against its bumpers before the overhead door opens. This creates a complete seal between the trailer and the facility interior, making it ideal for operations that store and transport environmentally sensitive products such as beverages, frozen food and pharmaceuticals.

Features include a precision-based inclinometer for accurate dock positioning and a floating deck that matches trailer movement during cargo handling. For easy cleaning, the deck hinge has no entrapment points, preventing the collection of dirt and creating a level bridge between the loading dock and trailer bed. When the dock returns to the stored position, protective cushioning shields the deck cylinder, preserving equipment integrity.

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Featuring a spring-loaded, foam-filled, pivoting head member, the WeatherGuard 1600 series dock header ensures a watertight seal at the top the vehicle, protecting products and personnel from rain, sleet, snow, hail and wind. Ideal for applications where the drive approach slopes toward the dock opening—causing water to funnel into the dock area—the unit can be installed as a complete unit or retrofitted to existing seals and shelters. It allows natural light into the loading dock area with a translucent, structurally supported rigid head member. Fairborn USA, 800-262-1188, www.fairbornusa.com.

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Offered as an option on all of the supplier’s dock shelters, the Hinge Guard system is made from impact-resistant, high molecular weight polyethylene (HMPE) to prevent energy loss and close off trailer hinge gaps without restricting access. The system comes in two profiles: large for refrigerated trailers and small for standard trailers.

When a trailer backs into the dock, the device activates automatically—grasping the sides of the trailer and covering the hinge gaps to create a consistent seal top to bottom. The seal prevents weather from entering a facility and conditioned air from escaping for improved employee comfort and decreased energy costs. Kelley Entrematic, 800-558-6960, www.kelleyentrematic.com.

Secure trailer RIG with vehicle restraint

To prevent premature trailer pullouts, the TPR truck positioned vehicle restraint automatically positions itself to secure a trailer’s rear impact guard (RIG) with a restraining force in excess of 30,000 pounds. Equipped with an advanced, three-light message system located in the NEMA 12 control panel, the device establishes a clear line of communication between the truck driver and dock attendant to maximize safety. Features include internal and external signage, LED lights, continuous engagement gear motor, and a low-profile 9-inch carriage with a service range of 9 to 27 inches from grade. McGuire, 518-828-7652, www.wbmcguire.com.

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Relieve restraint pressure from trailer creep with new hook
To alleviate pressure caused by trailer creep during unloading and loading, the EVR750 with ForceFlex Hook eliminates the forces that build between a rear impact guard (RIG) and hook connection. Because the hook prevents creep from developing, drivers no longer have to back up to allow the hook motor to retract. The restraint keeps the trailer secure until the release button is pressed. Its fully enclosed, 0.25-horsepower motor offers an operating range of 12 to 30 inches and creates a restraining force of more than 37,000 pounds. Pioneer Dock Equipment, 800-251-3382, www.pioneerleveler.com.
Thermal package increases energy efficiency, security
Adding the supplier’s Thermal Guard package to its selection of vertical storing dock levelers enhances energy and security seals for climate-controlled loading docks. This additional package allows truck doors to be opened from inside the building after positioning at the door without breaking a thermal seal at the dock. Features include an enhanced hinged bottom pad, bumper covers and extended bumper gussets to work with 10-foot-wide door openings. To protect the building, an extra bumper mounts to the face of the dock. Serco Entrematic, 800-558-6960, www.sercoentrematic.com

Hurricanes can’t level cold storage door
Miami-Dade County, Fla., has approved the VertiCool cold storage door with wind load package for use in high-velocity hurricane zones. When installed with a vertical storing dock leveler, the door increases energy efficiency in facilities located in hurricane-prone regions. The door has been tested to withstand pressures of +52 and -52 pounds per square foot and remain intact during straight-line winds. Equipped with 48-inch-high, 4-inch-thick closed cell foam panels, the door offers R-23 insulation and has fewer panel joints for a tighter seal. It rides on a heavy-duty, full opening height polymer thermal break track with 12-gauge galvanized steel guides. TKO/ASSA ABLOY Entrance Systems, 877-408-6788, www.tkodoors.com.

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**Deloitte Consulting**

**TITLE:** Global Supply Chain Leader, Deloitte Consulting LLP’s Supply Chain Practice  
**LOCATION:** Atlanta, Ga.  
**Experience:** More than 28 years of experience across many industries assisting clients in supply chain strategy, planning and transformation  
**PRIMARY FOCUS:** Supply chain strategy and operations improvement in warehousing and logistics

**Modern:** Let’s look at the recent survey you conducted with MHI. First, who was surveyed? And, since this was the second of these reports, how was this different from last year’s project?

**Sopher:** The survey included more than 400 supply chain professionals from a range of industries and company sizes. For instance, 57% of respondents held executive positions. And, the companies ranged in size from small to large, including 11% that reported sales of $10 billion or more. What was different this year was a focus on how companies are using emerging technologies to drive innovations in their supply chains. We did a deeper dive into user cases and provided examples that executives can use in their own supply chains to meet the conflicting demands to be better, faster and cheaper.

**Modern:** The report is titled “Supply Chain Innovation—Making the impossible possible.” What does supply chain innovation mean to you?

**Sopher:** We think of innovation as the ability to prototype, experiment and fail or succeed quickly to maximize an investment. It’s the appropriate use of technology as well as automation to develop new techniques to meet market demands, such as omnichannel, that we didn’t have before. It’s also about driving strategies that are scalable and affordable. Another factor at play is that innovations are adding a disruptive element to the industry. Emerging technologies like 3D printing will disrupt our industry and bring competitive advantage to some. I do think sometimes people don’t imagine that innovation applies to a DC, but when I went to ProMat, some of the automation I saw was very innovative. For example, you used to see a storage and retrieval crane going up and down an aisle to put away a pallet or a case. Now, you’re seeing shuttle and robotic technologies that increase throughput and provide storage in a much smaller space. That’s innovation.

**Modern:** In this year’s report, you identified eight technologies that will transform traditional supply chain models over the next decade. Which will be most important in the next three to five years and why?

**Sopher:** Predictive analytics and wearable technologies have only moderate adoption today, but will have the highest growth rate in the next three to five years—a nearly 25% CAGR. The use of predictive analytics is expected to triple in the next three to five years. Similarly, we see people piloting wearable technologies in piece picking environments and for maintenance in remote locations. As the cost comes down, we’ll see more and more interest.

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