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DCs LEVEL UP



Now that achieving efficiency is more pressing—and more challenging—than ever, distribution center operators turn to flexible automation solutions to boost productivity and optimize space utilization.

Boosting efficiency within distribution centers has become both more critical and more difficult. The pandemic, of course, drove a dramatic spike in the need for e-commerce capabilities within distribution centers, says Douglas Kent, executive vice president, strategy and alliances with the Association for Supply Chain Management.

“The industry was unprepared for this rapid shift to B2C (business-to-consumer) capabilities,” Kent says, adding that many organizations had to “compress their digital roadmap timeframe.”

Along with transportation backlogs, the rapid shift to e-commerce also upended distribution center operations. Retailers and manufacturers had to

quickly shift from managing pallets to working with parcels and smaller orders.

“That fundamentally alters the flow of product through your warehouse, as well as the supporting laboring systems,” says Kaitlin Peterson, senior director of product marketing with Locus Robotics.

Adding to the complexity is the unpredictability of consumer orders. “That’s a demand planning problem

that I don’t think anybody has figured out, and yet it completely changes how product comes into a warehouse,” Peterson says.

Retailers are used to volatility, Kent notes. Historically, however, the volatility has been relatively predictable; typically, it’s seasonal or driven by promotions. Now, retailers are confronting both volatility and unpredictability. Moreover, the traditional solution of stockpiling inventory comes with a cost.

Similarly, few distribution centers (DCs) were designed to accommodate the jump in volatility in the flow of goods moving in and out, says Mike Sansone, associate partner in the consumer practice with global strategy and consulting firm Kearney.

One indication is the drop in compliance with dock-door appointment times, which fell from about 85% to 60 to 65%.

5 WAYS TO UNLOCK DC EFFICIENCY

Companies can make these 5 moves to help ensure any technology deployments are as effective as possible in boosting distribution center efficiency:

- 1) **Rethink current processes.** Simply applying new technology to old processes likely won’t boost workflow efficiency and effectiveness, says Neil Bentley, product management director at Locus Robotics.
- 2) **Know your products.** Understanding your product mix, customer demand by item, and supply chain flows will help in pinpointing where to begin implementing any solution, says Spencer Shute from Proxima.
- 3) **Consider allocations and layout.** Review warehouse product allocations and map the floor plan and typical product pick patterns to identify ways to reduce redundant movements, Shute says. This can also help identify products that should be grouped together.
- 4) **Develop consistent measures of productivity.** For companies with multiple sites, developing consistent measures of productivity in like-for-like operations, while fostering transparency and sharing best practices, can have a tremendous impact on performance with limited investment, Kearney’s Mike Sansone says.
- 5) **Think holistically.** Taking an expansive view of distribution center operations helps in identifying where challenges are and the drivers behind them. “Collect data, employee input, and align performance expectations to ensure your solutions tackle the root cause,” Shute says. “This unlocks the potential to drive efficiencies that improve operations.”

While the market has partially recovered, volatility remains higher than pre-pandemic levels. “When coupled with more recent increases in freight and labor costs, as well as availability, shippers’ needs for efficient operations are amplified,” Sansone says.

Even as DCs were hit with supply chain bottlenecks and higher product volumes, many struggled with tight capacity and labor constraints, further hampering efficiency. “DCs often have less space to store and move products and less labor to get products out the door,” says Spencer Shute, principal consultant with Proxima, a supply chain consultancy.

ADAPTATION IS THE NAME OF THE GAME

Technology can help companies tackle these challenges. “Technology is ever evolving to make DCs more efficient,” Shute says. The best solutions for each distribution center are determined by the product types being handled.

Automating manual activities, while not a new idea, is critical to making processes more efficient and effective. Automating mundane, manual activities also can help attract candidates to distribution center and warehouse jobs, Kent says.

A driving force behind the interest in automation isn’t only reducing labor costs—although that remains key—but the lack of labor, says Don Caddy, chief executive officer with Engineering Innovation, Inc., a leader in automated equipment for parcel applications.

“The return on investment comes not from replacing labor with equipment, but from the ability to meet service level agreements (SLAs),” he adds. “SLAs don’t leave a lot of room to say, ‘Sorry, I won’t meet the agreement because couldn’t get anyone here,’” he adds.

Inflation also is driving interest in automation, says Neil Bentley, director

of product management with Locus Robotics. “One way to lower inflation is to become more efficient with your existing operations.”

A hybrid approach to automation typically offers the best value for most companies, Sansone says. Companies can enhance their existing equipment and gain efficiencies with targeted solutions, while avoiding capital-intensive systems that often provide less flexibility to meet future shifts in demand.

INCREASING ACCURACY

“Some solutions, like sort-to-light, pick-to-light, and audio-based systems, all but hand you the product,” Caddy says. They reduce training time while boosting accuracy, all without requiring a massive investment. And these systems work well with small orders that contain multiple SKUs—like many e-commerce operations.

The popularity of artificial intelligence as a tool to maintain service levels is growing. The effective use of analytics can enhance inventory control and help distribution centers more effectively manage demand and supply, Kent says. For instance, machine learning, a subset of artificial intelligence, can draw from historical data to help predict volatility levels.

Robotics is another solution. In some applications, it’s possible to develop a fully automated warehouse that

can operate 24/7 with little human interaction aside from monitoring, Shute says.

FLEXING WITH DEMAND

“Robotics allows you to flex with the ebbs and the flows of demand,” Peterson says. Especially with the robots-as-a-service model, distribution centers can scale up and down according to the volume that’s moving in and out.

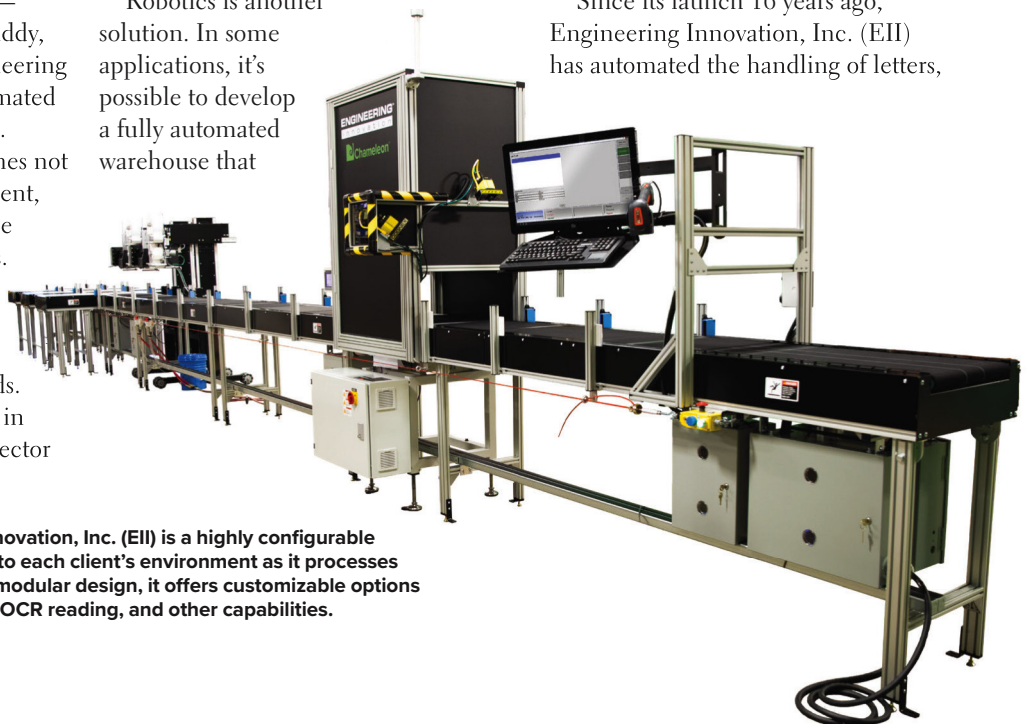
Moreover, the idea that robotics and automation are going to replace jobs isn’t generally accurate, Peterson adds. Instead, these tools are performing the jobs companies can’t fill, while also making the roles more efficient and effective. She likens it to the introduction of the sewing machine, which boosted productivity, while reducing injuries.

As important, technology solutions offer distribution center employees, including entry-level workers, the opportunity to gain critical competencies in applying digital technology or robotics to operations.

“These aren’t just jobs but an entry to careers,” Kent adds. “We need to make distribution centers more of a career choice.”

ENGINEERING INNOVATION: ADDRESSING UNIQUE CHALLENGES

Since its launch 16 years ago, Engineering Innovation, Inc. (EII) has automated the handling of letters,



The Chameleon® from Engineering Innovation, Inc. (EII) is a highly configurable parcel processing system that adapts to each client’s environment as it processes up to 4,500 parcels per hour. With its modular design, it offers customizable options for sorting, labeling, barcode reading, OCR reading, and other capabilities.



Your First Call for Startup and Cell-Level Automation Solutions

Whether you're a small to mid-size fulfillment center trying to elevate up to the next level of throughput capacity and speed, or already a high-volume operation looking to optimize a specific point or line in your processing stream, Engineering Innovation is your ideal partner.

Engineering Innovation is uniquely focused on developing custom parcel processing equipment solutions that are compact, modular, affordable and, most of all, easily scalable to grow with you—making your specific warehouse transition from manual to partial or full automation fast, seamless, cost-effective and forward-looking.



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flats, and small to mid-sized parcels for hundreds of companies. Through its work, EII has also acquired unique expertise in postal regulations, along with deep experience in site-specific process evaluations. As a result, it's able to optimize each client's throughput and boost destination accuracy.

"EII excels when customers have unique problems," CEO Don Caddy

says. "While we effectively handle standard applications, it's when someone says, 'I have a problem, and I'm not sure how to solve it,' that we tend to do well."

For example, EII has invested time and resources to handle poly-bags, which tend to scrunch up within traditional conveyors and wrinkle when the system tries to read them. Glare also

has been a challenge. So, EII makes its own camera that can read poly-bags.

The acronym EII also stands for Excellence, Integrity, and Innovation. The company offers stellar support, including preventative maintenance trips and an after-hours support line, helping clients tackle challenges and gain a competitive edge.

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AUTOMATION EVOLVES WITH DC NEEDS

By Brian Reinhart, VP of Sales & Solutions, Hai Robotics

DC efficiency is more important than it has ever been, and the premium on an efficient system has grown exponentially. By becoming efficient, distribution centers can ease the burden on labor, manual intervention, and footprint requirements. Efficient DCs can pivot faster to meet evolving customer requirements, seasonal demands, or SKU profile changes.

Helping DCs Run More Efficiently

High-performance, high-speed systems allow DCs to handle the e-commerce and omnichannel boom without adding labor. When your operators are performing 5x faster, you become more efficient and more lean.

From there, automation can attack warehouse density. By storing products to the top of a warehouse, often 30 feet high or more, and storing them in a multi-deep or grid fashion, we're able to greatly reduce the footprint needed to house products. This allows more space for growth, expansion, seasonality, or unknown surprises.

Lastly, the most recent evolution is the introduction of flexibility into the DC. With the introduction of mobile technologies to high-speed, high-density systems, we can now combine the best in speed, density, and flexibility.

That flexibility comes in numerous forms: service-based pricing models, seasonal rentals or leases, low infrastructure requirements, non-precision-based storage, to name a few.

Turn-Key Solutions

Hai is the world leader in autonomous case handling robotics (ACR). Our HAI PICK system is a high-speed (500+ tote presentations per hour per workstation), dense (10 meters tall, double-deep storage), and highly flexible

goods-to-person solution. Packaged with world-class, AI-driven, in-house software, localized engineering, project management, and support, Hai serves its partners and customers with a full suite of options.

Hai also partners with third-party suppliers to provide racking, totes, fencing, conveyors, and any other equipment needed. Hai's in-house integration capabilities can also help fill gaps for our customers or partners by adding supplemental technologies outside of the Hai system.

The Hai system is sophisticated and mature enough to serve the largest organizations in the world, while also being flexible and cost-effective to serve smaller organizations or startups. Hai's client portfolio ranges from Fortune 50 companies deploying 100-bot fleets to a facility starting its automation journey with 1 or 2 robots. All customers are treated like partners.

Global Partner

One of our longest tenured global partners, JD.com, has done numerous projects with Hai. The Hai robotics platform allows JD to hit ever-increasing volumes, including peak, with minimal workforce. The speed of the Hai system yields a 3-4x labor reduction compared to manual or semi-automated solutions. In addition, the density in the Los Angeles warehouse allows JD to handle all tote and case-based operations in a 40,000-sq.-ft. footprint of the 250,000-sq.-ft. warehouse.

Lastly, the flexibility allows JD to expand or adjust the system with minimal foresight needed. Hai's on-call support and service ensures maximum uptime for the system, and the proactive maintenance plan ensures maximum equipment lifespan.

Solve Top Efficiency Challenges with Robotic Automation

To handle both peak season volume and regular order volume efficiently, distribution centers need scalability. The robots-as-a-service (RaaS) model lets you add and subtract as needed.



Kaitlin Peterson
Senior Director of Product Marketing
Locus Robotics

What are the biggest challenges facing enterprise-level distribution centers today?

The number one challenge today is labor, and it's in a variety of forms that include labor shortage, absenteeism, and high turnover rates from walking 12 miles a day while dragging around a large, heavy cart.

The second biggest challenge is the unpredictable nature of what's coming in and leaving the warehouse.

Containers are finally off the ships that were stuck in the water. Those products are now flowing through the ports and ending up in trailers or containers outside of warehouses because the warehouses don't have the capacity to bring in that inventory and process it—making demand planning a lost cause.

The third challenge is the economical uncertainty of the world. People are concerned, so they're holding off on certain expenditures, while trying to eke a little bit more out of their current CapEx models rather than trying to sign up for new things like warehouse automation.

They know they need to automate, but they're not sure what type they need.

How can large distribution centers use automation to evolve and get past these challenges?

The biggest way that large distribution centers can get past their top challenges is to look at automation solutions that are flexible, scalable, and safe. The solution needs to be flexible due to demand changes.

If you're building a new center, do you want to build it for the number of people you need to fulfill peak season orders or do you want to build it for the number of people you typically employ every single week? It's a false dichotomy.

You need to create an environment that can handle the volume of peak season and your regular order volume without overpaying.

For scalability, you need to be able to add and subtract as needed, and you can easily do so with a robots-as-a-service (RaaS) model.

With Locus Robotics, our robots are not replacing people. Instead, the robots work alongside warehouse associates to

make their jobs better and upscale their skills to help them have a safer and more enjoyable working environment.

What competitive advantage can automation providers offer companies that operate at enterprise levels?

For 3PLs, the biggest competitive advantage provided by automation is that they can offer automation as an added service to their customers.

With automation, the cost to do business with a 3PL is significantly lower and comes with faster throughput, increased efficiency, and less errors.

For a distribution center, the biggest advantage is to handle those peak season volumes without having to hire 25-100 temporary workers.

The idea is to be better able to maintain and manage the volume changes as they go up or down and be able to better serve your customers. Automation makes your processes faster and more efficient.

How does Locus Robotics help enterprise-level distribution centers handle their challenges?

With Locus Robotics, our customers can take advantage of the benefits of automation from day one, and we can scale with you long-term.

We're not just a starter package of automation; you can start with 50 bots and go up to 500 bots on four mezzanines, for example, with our solution. Plus, we come from a logistics background so we fundamentally understand warehousing and logistics in a way that other robotics or automation providers may not.

Learn more about Locus Robotics.

www.locusrobotics.com



Several business units make up EII. The Postal automation unit offers solutions to sort letters, flats, and parcels. EII's Postal Steward eVS (electronic verification system) creates and submits eVS mailings to PostalOne!, the U.S. Postal Services' web-based suite of services geared to business mailers. And the parcel automation group includes automated parcel sorting machines, sort-by-light, pick-to-light, flats and parcel manifesting, among other solutions.

CONFIGURABLE SOLUTIONS

The Chameleon® is a key EII solution. It's a highly configurable parcel processing system that adapts to each client's environment as it processes up to 4,500 parcels per hour. With its modular design, the Chameleon® offers customizable options for sorting, labeling, barcode reading, OCR reading, and other capabilities. "Clients can tailor it to how they want," Caddy says.

That's in contrast to some systems that offer multiple functions, but tether all of them to a single controller. In contrast, because each EII module has its own controller, the modules can be rearranged or added to or subtracted from to meet customer needs. "Clients effectively gain a custom machine without the need to build it from scratch," Caddy says. "We strive to offer the most impact with the least disruption."

In addition to its hardware and software solutions, EII offers consulting services, in which it takes a comprehensive look at clients' operations. For example, if a company approaches EII with plans to automate one function, the EII team will ask how any changes will impact other processes. "Often, it helps to have

someone from outside ask the right questions," Caddy says.

If, during its consulting work, EII determines a potential client would be better served with a competitor's system, it will recommend that. "If our plan includes our system, that's great," Caddy says. "If not, we'll let the company know."

EII worked with one company that had been looking for a solution to more effectively sort packages of varying sizes and that were headed to 70 destinations. Because they had to measure and weigh each piece and also apply labels, dozens of workers were able to process only about 75 per hour.

EII worked with the company to configure a machine that could weigh and measure the packages and assist in applying labels. Now, just two people process about 1,500 packages per hour.

Results like this have driven EII's growth. Since it introduced the Chameleon® in 2018, implementations have quintupled, Caddy says.

LOCUS ROBOTICS: ROBOTS THAT CAN FLEX AND SCALE

Several years ago, many companies considered robotics a cool technology, but would start with a pilot. Only if that went well would they consider broader implementations, says Kaitlin Peterson, senior director of product marketing, for Locus Robotics.

The conversation has since shifted. "Companies are now saying, 'We

have to automate. There's no labor available,'" Peterson says.

As companies reach this conclusion, many turn to Locus, which in September 2022 announced that its LocusBots had topped one billion units picked. In total, LocusBots have traveled more than 17 million miles in customers' warehouses, or the equivalent of 35 round trips to the moon. Its solutions have been deployed at more than 200 sites around the globe.

Locus focuses on automating material movement through a facility, from goods coming in, to picking, packing, and shipping. LocusBots add the most value when handling high-volume and rainbow orders—that is, lots of lines and different items, says Neil Bentley, director of product management.

In addition, the Locus Vector is designed for high-productivity materials handling and logistics applications. Its industrial-strength chassis, omnidirectional mobility, and compact design enable it to handle products up to 600 pounds.

LocusBots free employees to handle more value-add activities. Moving a pallet or a cart between pick locations doesn't add value, and robots can do this more efficiently. "In contrast, finding the right item and right quantity

Locus solutions can be scaled up to meet peak seasons, and then scaled down once the season is over.



and getting it packaged correctly—that's where associates really add value," Bentley says.

ROBOTICS-AS-A-SERVICE: SCALABLE, DATA-HEAVY

In working with customers, Locus's engineering team seeks to understand their workflows and replenishment needs. For example, if a healthcare company needs to capture certain data to comply with regulations, Locus will work with the organization to develop an efficient, automated process that accomplishes this.

Because customers lease solutions through Locus's robots-as-a-service (RaaS) model, they gain ongoing service and maintenance expertise, as well as immediate access to software updates. These are key capabilities in today's dynamic warehouse environment.

Clients can quickly scale Locus solutions to meet peak seasons, and then scale down once the season is over. In contrast, with many other solutions,

they'd need to invest enough to meet their peak season, even if the equipment remains underutilized much of the time.

"Robots-as-a-service allows clients to right-size for their business fluctuations," Bentley says.

As important, companies don't need to re-do their distribution centers to implement Locus solutions, Peterson says. Instead, they can incorporate LocusBots within their existing infrastructure.

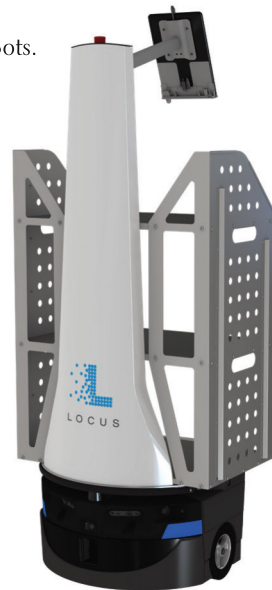
Real-time Locus dashboards provide actionable insight. For instance, they can identify areas of congestion within a distribution center, so management can assign associates to work through the bottlenecks. The reports can also provide longer-term data that companies can use to analyze performance across multiple systems.

Through its sustainability initiative, Locus refurbishes its robots. While LocusBots already are durable and long-lasting, this further extends their lives.

A global logistics provider turned to Locus Robotics to improve its customers' supply chains and boost efficiency and fulfillment. After observing the productivity improvements generated by a six-robot pilot, the company deployed 56 LocusBots. Worker productivity doubled, while cycle time was cut in half.

Robotics, and particularly Locus, are no longer baby steps to automation, nor a nice-to-have technology.

"We're proven," Peterson says. "If you're looking for a highly automated, highly efficient facility, Locus is that solution." ■



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