Robotics24/7

Automation Spreads in Supply Chains

As robots multiply in warehouses and other facilities, operators need to know where to start, how to manage them, and what they should expect.
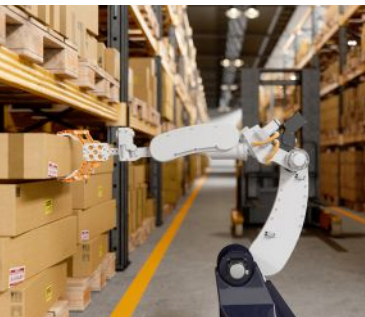
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Editor's Note

Welcome to the first Special Focus Issue from *Robotics 24/7*! It's just one of Peerless Media's offerings to help robotics users, integrators, and developers keep up to date on key technologies and trends.

This issue focuses on how supply chains can take advantage of growing automation options. The COVID-19 pandemic has reportedly accelerated e-commerce demand by five to 10 years, but every industry is looking for increased productivity, flexibility, and safety, not to mention scarce skilled labor.

As more warehouses and distribution centers deploy mobile robots, they have to decide how to manage them. We hope to help operations managers sift through the technologies and best practices to be successful.

The team at *Robotics 24/7* has carefully curated some of the best articles on interoperability efforts, demystifying the hype around robots, and finding the right fit for your warehouse. In addition, we round up announcements around the virtual Automate Forward and ProMat DX events, even as we look forward to eventually returning to face-to-face conferences and trade shows!

I hope you'll find this Special Focus Issue informative, and let me know what you'd like to see in future issues. I'm also interested in learning about your own robotics journey!

Eugene Demaitre, Editorial Director
Comments? E-mail me at
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With the most advanced technologies and a deep, dedicated robotics team, MHS has the capacity and expertise to get AMR solutions up and running quickly in your operation. We integrate with best fit, cutting edge providers to reduce labor requirements in order fulfillment processes like load transportation, inbound/outbound handling and more.

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ROBOT
FLEETS

Grow Demand for Warehouse Management Software, Interoperability Layer

BY EUGENE DEMAITRE

Hardware vendors, software providers, and integrators all find roles to play in coordinating complex systems for flexibility and throughput.

As more warehouses and distribution centers add robots to keep up with e-commerce demand and compensate for staffing turnover and shortages, new challenges have arisen. Who should manage them, how will they communicate with enterprise systems and one another, and what happens when people and robots from different vendors must collaborate?

Many autonomous mobile robot (AMR) makers now offer software and remote operations centers to manage warehouse fleets. As robots become more specialized, the ability to effectively deploy them is becoming a greater differentiator than the hardware.

When people think about self-driving vehicles or robots moving something from Point A to Point B, just about any technology will do, but it has to fit into the whole facility and the whole enterprise," said Daniel Theobald, founder and CEO of Vecna Robotics, whose Pivotal multi-agent AI is designed to orchestrate multiple systems. "Robots need to be able to respond in real time to workflow changes. If the entire system is not reactive, you're leaving tremendous value on the table."

Instances of various types of robots from multiple vendors are still relatively rare—most simply hand off goods or materials to one another rather than truly coexist on the same floor. Still, several third-party competitors are starting to offer software and services to relieve operators of the complexity of managing such mixed environments.

In addition, major robotics users such as FedEx are encouraging the development of standards and have joined organizations working on different aspects of the interoperability challenge.

Robotics 24/7 spoke with several leading companies about increasing recognition of the need for interoperability, the growth of third-party solutions, and efforts to standardize how warehouse robots are managed.

Awareness of the need

Many users are just beginning to understand the concept of scaling robotic fleets, noted Florian Pestoni, CEO of robot operations service provider InOrbit. "It's a sign of where the industry is," he said. "Few companies are thinking in terms of orchestration. It's still about building a robot that does something, not about running thousands of robots at once."

"There are tremendous opportunities for improvement by combining artificial intelligence and the cloud with robots," Pestoni said. "At the end of the day, customers want two things: the ability to get all the data and make sense of it, and the ability to make continuous improvements,

such as optimizing when a robot stops picking and goes to recharge."

"Enterprises face two key challenges—optimization and competitive threats," said David Inggs, co-founder and CEO of Rocos, which provides a cloud-based platform for managing robot operations. "Proofs of concept aren't about the robot or our platform as much as customers learning what they need to do in terms of software and automating physical processes. 2020 was the year of early adopters learning through trials; 2021 is the year that people scale from 10 to 20 robots to hundreds or thousands."

"Humans are great at local optimization—we know which pallet to pick first—but they're terrible at systemwide optimization," Theobald said. "Pivotal doesn't care about what kind of work is being done, and it knows the capabilities of each agent. It can assign tasks to a robot or a manual forklift."

"Many in industry talk about wanting to expand applications of robots, but they've been put off by interoperability issues or how to combine robots from different vendors," said Aldus von der Burg, founder and CEO of Meili Robots. "They don't want to juggle between three fleet management systems."

"How good is the software from the robot manufacturer?" he asked. "Can it do all the operations you need? Omron has one of the best, but once you introduce another robot into a space, it matters if they can't communicate."

Reducing complexity

"Challenges in today's distribution centers include moving items from the loading bay on a pallet mover to tote carriers in another section of a warehouse," said Pestoni. "Whether it's with the same or different vendors, it adds a level of complexity."

"AMR providers have a lot to learn from manufacturing," he added. "Factories used to be very rigid, highly structured environments. You'd build a factory around a production line. Now, things are changing fast, and you need to be more adaptable. We're now looking at daily versus annual improvements."

Complexity and vendor lock-in are concerns for many warehouse operators, said von der Burg. User feedback has been varied, he acknowledged.

"The C level wants to bring down costs and increase production, but floor managers want to minimize the disruptions caused by new technology," he said. "Analytics for tasks and productivity can be overwhelming. How can we reassure them? Our back end is advanced, but our user interface is simpler."

"Some systems are fantastic, but non-technical people need to use them," von der Burg said. "For example, Freedom Robotics has insane analytics, but most warehouse managers don't care about that level of detail. Meili FMS provides not just controls but also an overview of performance of robots in different areas."

Meili FMS features

The Meili Fleet Management System (FMS) includes features for autonomous task allocation, data analytics, and map optimization.

"We talk about mean time to resolution and autonomy excceptions, but the secret is

> *"Some [fleet management] systems are fantastic, but non-technical people need to use them."*
>
> — *Aldus von der Burg, CEO, Meili Robotics*

melding AI and people and getting the robot back to doing its thing," said InOrbit's Pestoni. "I can be notified on my phone that a cleaning robot on the other side of an airport finds a spill and doesn't know what to do. But if I can get help remotely from someone close to it or from a systems operation center, then the minimal time spent is not a bad thing."

Why third-party software makes sense

In addition, most warehouse managers don't know what they're looking for in automation, and competition can cause confusion, according to von der Burg. "They don't really like the robotics manufacturers' fleet management systems," he asserted. "They're supposed to be flexible, but they're restricting operators from using robots to full capacity."

"One customer didn't integrate to their WMS [warehouse management system] because it was too complicated and costly," von der Burg said. "They chose to limit themselves to 30% capability—they're not using automated mission control and took shortcuts. Instead of localization for trucks on screen, they put bells at intersections."

"The mobile robot makers don't always sell their own software, so there's the fear that the installers aren't doing it to the vendor's standard," he claimed. "The robot manufacturers say, 'We want to sell more robots,' so they see us as a complementary solution."

"Business processes are unique to an organization, so if you define jobs to be done in someone else's software, you're locked in," said Rocos' Inggs. "By abstracting a mission or a job, we can call a Boston Dynamics robot for agility and then refer to a Clearpath one for endurance. We provide a translation layer to specific form factors."

"'m not sure how third parties will play out," said Theobald. "It's pretty clear that operations centers are key for any modern warehouse. Who ends up running them will be a mix. Big 3PLs [third-party logistics providers] will run their own. Some will try to build their own software, and we'll see a lot of cloud-based services. Everybody used to have their own data centers, but that's now out on the cloud."

Simulation to reality

"We want to enable operations like sending a Fetch robot to a human," said Meili's von der Burg. "We try to simulate the same behavior

with integration to autonomous task allocation, but we don't yet limit to a specific robot type. We could create the same simulation for robot-to-human picking operations."

"What are the processes to be automated?" asked Inggs. "As we scan environments and create digital twins, we can build the digital infrastructure and solve the networking problems and manipulation challenges."

"Since we can't expect robots to be online 100% of the time, we have to provide missions and be prepared for exceptions," he added. "The architecture has to be very distributed, between the server, the edge, or on the device. With IoT [the In-

ternet of Things] and the cloud, we're getting to the point where it has to be quite fluid."

Agriculture, mining, and delivery robots are other areas where fleet management software and services will eventually be needed, argeed the industry experts.

"Orchestration software is essential where you have dynamic environments, such as 3PLs, medical device distributors, or in big manufacturing plants," said Theobald.

Heterogeneous environments

"It's still early. One of the biggest examples so far is FedEx," said Meili's von der Burg. "There are a few companies that have tried fleets from multiple vendors. A pharmaceuticals firm was using AGVs [automated guided vehicles] for a while and tried to mix AGVs and AMRs."

"In Denmark, hospitals are diversifying their fleets," he added. "For example, one is using AGVs for laundry or heavier items in hallways, and it is using MiR100s or MiR250s to deliver supplies to rooms. It's now thinking of using more robots for disinfection or automated beds."

"I think the market will get bigger when it comes to robotics applications on the street, like street cleaners, parcel deliveries, and some autonomous vehicles," said von der Burg.

"Businesses are beginning to realize that rather than wait for one vendor to do it all, they can get best-in-class systems for inventory, floor scrubbing, or materials handling," said InOrbit's Pestoni. "You get very quickly from one vendor and

"Every organization has to make its bets... Automated warehouses are part of a wider food chain, ranging from autonomous trucks for the container yard all the way through pick and place off conveyor belts. It's an end-to-end journey."

— *David Inggs, CEO, Rocos*

one task to multiple tasks and robots."

"We already have multiple robots, including tuggers, pallet trucks, and counterbalanced forklifts," said Vecna's Theobald.

"It doesn't make sense for each robot manufacturer to integrate or for each WMS or WES [warehouse execution system] vendor to be expert in every robot," Pestoni said. "We provide a thin orchestration layer in the cloud, and the system knows what needs to be done. It uses an API [application programming interface] and calls on whatever robot is best for the task. You don't want a floor scrubber in the way of pallet movers in a loading bay."

"Every organization has to make its bets," Rocos' Inggs said. "Automated warehouses are part of a wider food chain, ranging from autonomous trucks for the container yard all the way through pick and place off conveyor belts. It's an end-to-end journey. We're starting to see bespoke applications in addition to one-stop shop systems integrators."

InOrbit's cloud-based robot management platform is designed to enable engineers and operators to manage robots remotely. Source: InOrbit

Other companies working on robot interoperability include Formant, Körber Supply Chain, SVT Robotics, and Waypoint Robotics.

Standards efforts

Improving the ability of different robots to communicate is the focus of working groups at the Association for Advancing Automation (A3), the Advanced Robotics for Manufacturing (ARM) Institute, and others.

"Interoperability is important. It's a space we feel strongly about and are investing in," said Fergal Glynn, vice president of marketing at 6 River Systems Inc. "We're a member and an active participant in the Materials Handling Industry's Robotics Group, and Chris Cacioppo, our chief technology officer, is working with Mass-Robotics and other local companies on a specification for robots to talk to one another."

"Our goal at ROG this year is to raise awareness about the issues and a realization that buying a robot is only the start of the journey. To take... full advantage of the technology, you need coordination of people and robots working together."

— *Florian Pestoni, co-founder of the Robot Operations Group (ROG)*

"Our goal at ROG this year is to raise awareness about the issues and a realization that buying a robot is only the start of the journey," said Pestoni, who is also co-founder of the Robot Operations Group (ROG). "To take full advantage of the technology, you need coordination of people and robots working together."

"Logistics companies just happen to use robots. This new wave of organizations—we're enablers," said Inggs. "Robotics-as-a-service [RaaS] providers are trying to get as much off the shelf as they can and assemble the smartest bits from the smartest providers."

The days of unified, easy-to-use tools for managing semi-autonomous drones, AMRs, remote-controlled trucks—and people—in a warehouse may not be here just yet, but they're coming soon. ∎

Eugene Demaitre is editorial director of Robotics 24/7.

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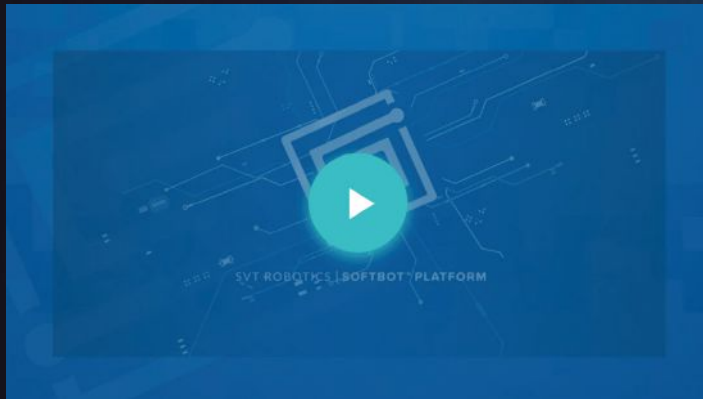
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DISRUPTION VS. HYPE:
What Is the Reality for Robotics?

BY MILAN A. RACIC

Autonomous mobile robots are spreading, thanks to converging factors, but more user demands must be met, says one entrepreneur.

Robotics will be among the biggest disruptive technologies over the next 10 years, say industry analysts, but automation producers took a big blow last November when Walmart announced that it was ending its contract with Bossa Nova Robotics. So what can we really expect from robots and automation?

Humans have been trying to make jobs easier since the dawn of time. It is one reason why we domesticated animals. It is why we built watermills, windmills, automated looms, steam engines, tractors, and a whole host of other machinery that allows us to do more with less effort, less danger, and in less time. It is the same driver behind autonomous mobile robots (AMRs) – to reduce hard work, injuries, and costs while increasing speed, flow-through, and efficiencies.

In a recent poll of 1,000 supply chain executives, Deloitte and MHI found that they anticipated that robotics and automation would be the biggest disruptive technologies in the industry over the next 10 years.

The harsh truth

While the current crop of mobile robots can reduce some labor, some time, and some costs, right now, the benefits have not been enough to justify the purchase of tens of thousands of such robots for some large corporations. In Walmart's case, the benefits provided were not enough to justify the purchase of 1,000 robots, even though they were already ordered and announced.

If industry had the robots that it really needed right now, there would be more robots in service.

— *Milan A. Racic*

If industry had the robots that it really needed right now, there would be more robots in service. AMR start-ups and integrators have been working on this for a decade.

Over a billion and a half dollars of capital has been invested across the ecosystem, yet there is no clear winner and a very wide, sprawling tail.

The ratio of hype-to-robots is about 10,000:1

Are mobile robotics start-ups pushing technology barriers? Many are, yes. But very few of these products pass the return-on-investment (ROI) test.

Over the past 10 years, many automated guided vehicle (AGV) and AMR companies have produced disruptive technologies that get investors and technology aficianados excited. But these machines don't do enough for actual customers. They can do some useful tasks, but they are ancillary to companies' core operations.

These robots can move autonomously, but they usually do so at speeds far below that of a forklift with a human driver for safety reasons. They show operational potential but lack compelling capability.

Some in the market have told vendors that their robots don't bring enough savings or additional revenue within a reasonable timeframe to warrant senior executives putting their careers on the line with a significant purchase. The Walmart example demonstrates the problem of product/market fit.

An epic convergence provides disruption

On the other hand, a number of factors have converged to accelerate business automation plans. Initially, warehouse and distribution centers considered AMRs because workers were hard to find or were unwilling to do hard, monotonous, and low-paying jobs.

Large enterprises then realized that they had to reduce their "people risk" during COVID-19 lockdowns. Having too few workers is a headache, but having no workers is a nightmare. That nightmare was compounded by an economic recession and U.S.-China trade tensions.

Virtually overnight, automation converted from a "nice to have" pilot or public relations coup to a life raft. Enterprise customers are willing to devote more resources to automation, even if it means lowering the ROI threshold or giving it more time to prove itself. However, they have not lowered that threshold to zero.

AI and autonomy are being commoditized

Many excellent teams are developing artificial intelligence and autonomous systems. Not only are new players entering the market in record numbers, but key factors in AI development like machine learning are being automated. These forces will lead to the commoditization of AI and autonomy.

That is not bad. After all, the cloud is a commodity. Companies like Amazon, Google, Microsoft, Oracle, SAP, and others make billions of dollars because they know how to package, deliver, and support that commodity at scale. So it will be with autonomous robots.

Execution will drive AMR adoption

If all the above factors have only heightened demand for AMRs in sectors like logistics, manufacturing, retail, consumer goods, and pharma, then we should expect a large number of robots to enter service in those sectors. However, I do not expect that robot uptake will be concomitant with demand until we have resolved the product/market fit issue.

Walmart may have pulled the plug on Bossa Nova, but no one has pulled the plug on robots. The winners in this race will be the disruptive technology providers who respond to what enterprise customers have been telling them all along. ■

Milan A. Racic is co-founder of visual AI-based mobile robot startup Gideon Brothers.

DISSECTING THE
STARTUP BUZZ
AROUND ROBOTICS IN
DISTRIBUTION CENTERS
BY ROBERTO MICHEL

Why investors are willing to bet on robotics startups, such as those supplying mobile robots to distribution centers.

I t is still early days for widespread use of technologies like mobile robots and artificial intelligence in warehousing, but robots and AI seem to be everywhere in industry announcements. Plenty of attention is also on startups that offer these technologies, and the significant amount of funding they're attracting.

The reasons for all this buzz goes beyond the visual "wow" factor of tote-laden autonomous mobile robots (AMRs) zipping around warehouse floors, reducing much of the walking involved with more manual methods of order fulfillment. The drivers revolve around the intersection of the pressing end-user needs for fulfilling orders more rapidly and efficiently, with the rapid evolution of technologies like sensors, AI and autonomous navigation.

Not only are companies with DC operations feeling the "Amazon effect" of filling orders faster and cheaper, but a growing importance has been placed on warehouse fulfillment among C-level leaders as a competitive lever, says John Sidell, CEO and principal with consulting firm New Course. "Chief supply chain officer is now a title in many large organizations," says Sidell. "There is broad realization of just how important supply chain fulfillment is, because in many ways it's the most crucial touchpoint with the customer."

The money has been pouring into DC-focused robotics and AI startups in recent years, with funding coming not only from some larger investment entities, but also smaller firms focused on logistics and robotics innovators. Some industrial companies also have established investment arms, notes Sidell, so multiple sources of capital are available, not just the big venture capital firms, or VCs, that typically fund consumer-focused startups.

Executives with startups in robotics and AI cite multiple reasons for all the growth. The technology itself has advanced rapidly in recent years, and price points for the sensors and hardware have come down. Then there is acute need in the market, driven by DC operators who are watching big players like Amazon get bigger, and using tech like AMRs as part of their playbook.

And as most any observer of warehouse robotics knows, back in 2012, Amazon acquired one of the pioneering startups in warehouse robotics—Kiva Systems—for $775 million, signaling Amazon's commitment to leveraging robotics, and raising the level of interest of AMRs among investors, established automation solution providers, and end-user companies.

A series of events advanced the market for warehouse robots. "One of the first events was Amazon's acquisition of Kiva, which reflected Amazon's early recognition that labor availability was going to be a major challenge," says Julian Counihan , a partner with Schematic Ventures, an early-stage venture capital fund. "Over time, all companies with fulfillment operations began to realize the same thing, and the business case for robots began to make more and more sense."

Multiple factors coalesce

Another big factor, adds Counihan, is that robots today are powered by machine learning adaptable to variable environments rather than preprogrammed with fixed instructions. That flexibility reduces deployment time and infrastructure requirements for robots while allowing the robot to operate in changing conditions. "Robot startups have pursued commercial applications of recent advancements in computer vision and machine learning that allow robots to handle formerly manual, complex tasks," he says.

While the rise of e-commerce and advancements in robotics have been happening for years, notes Counihan, the COVID-19 pandemic and subsequent increase in e-commerce have changed the automation business case and greatly accelerated adoption.

"Post-COVID, resilience is a new variable in the automation business case calculation that represents the ability to continue to operate in the event of future labor shocks," says Counihan. "With resilience now in the equation, automation investments can make sense where they did not before and automation investments that made sense before are now obvious decisions."

Kristi Montgomery, vice president of innovation, research and development with Kenco, a major third-party logistics (3PL) provider, also sees factors such as C-level focus on logistics execution, and rapid evolution of technology as core reasons for all the startup activity as well as the ongoing labor availability issue.

"The labor availability issue has become more pronounced as the years have progressed, which is another key factor that makes supply chains ripe for disruption through automation solutions that can help overcome that labor

shortage, and also, to make the associates you do have more productive," says Montgomery.

Tom Galluzzo, CEO and founder of IAM Robotics, founded in 2012, also sees multiple drivers for the startup activity, including end-user need for fulfillment efficiency, as well as the rapid maturation of tech like autonomous navigation.

There is another, fundamental reason why many robotics companies are aiming at warehouse applications: The world of the warehouse presents some relatively focused tasks and workflows that are ripe for automation gains with the current level of AI and robotics maturation. By contrast, he explains, a manipulation robot for the consumer world—envision a mobile robotic housekeeper—would have to be capable of doing a much larger universe of tasks that would stretch the limits of what robots can do.

"Logistics presents a more controlled environment and problem set that is surmountable with the current level of technology and what robots are capable of doing," says Galluzzo. "Logistics and warehouse fulfillment are right at the intersection of current technology and market need."

Manufacturers have used robotics in factories for decades and continue to update those technologies, though generally, they're already automating key plant-floor processes, notes A.K. Schultz, co-founder and CEO of SVT Robotics, a startup that offers an integration platform for robotics. That head start has many industrial companies eying DCs as the next best place to find big efficiency gains with robotics. "There is just not a lot of juice left to squeeze out of manufacturing," he says.

Technology startups that focus on enter-

prises also tend to have better customer "stickiness" than consumer tech startups, says Schultz, which makes them attractive to investors, even if they aren't likely to become a household name like an Uber. "It's all these factors in combination, sort of blending together like ingredients in a Crockpot, that gets us to what we see today with all the startup activity," Schultz says.

Working with startups

For end-user organizations, funding momentum for startups indicates investor confidence, but the real concerns are: Does a startup's technology address pain points like faster order fulfillment without the struggle to add labor? And does the new tech integrate easily with existing systems?

There are affirmative answers to these questions, but not exactly simple ones, because they involve carefully proving out and piloting technology. It also starts with more collaborative attitude in working with a startup to fine-tune capabilities, versus working with a larger vendor that offers more standard solutions that have been deployed successfully for many years.

"I advise large companies considering emerging technology to take a more collaborative approach and view startups as partners, rather than vendors," says Schematic's Counihan, "With this framework, companies work with the startup to design products to achieve a better outcome rather than passively evaluating a commercial purchase."

While deploying most any type of materials handling automation benefits from careful planning, going with technology from a startup is often done during a proof-of-concept stage or "POC," often

IAM Robotics expanded its headquarters to include its own test facility with a working warehouse environment to help develop solutions. Founder Tom Galluzzo is pictured (standing, center) in the IAM Robotics Showcase and Innovation Center.

followed by a pilot project in a production setting. Time and effort spent on POCs not only reveal issues that might require extra attention, but also can identify how a new technology fits with existing systems or can augment existing systems.

"Integration issues tend to be a big area of focus for us, working through all the details of what is needed for the process we want to achieve," says Montgomery. "It seems a simple thing to say, 'we need this new system to talk to another system,' but in some cases, the integration can drive new or different workflows, so testing how the workflows function is an important part of proving out a new tech-

> "It seems a simple thing to say, 'We need this new system to talk to another system,' but in some cases, the integration can drive new or different workflows."
>
> — *Kristi Montgomery, VP of innovation and R&D, Kenco*

nology. Many of these newer technologies also have a good bit of optimization built into their software component, even if it has a hardware aspect as well, and so we work closely with the startup to determine how to leverage that optimization to augment or fill gaps in existing capabilities."

Kenco's Innovation Lab includes a 10,000-square-foot warehouse to prove out solutions in a real-world setting, where robotics hardware or sensors can be tested in a production environment. Montgomery also advises getting input from floor associates, lift truck drivers, or for transportation technology, truck drivers, so that feedback on issues like ergonomics or software ease of use can also be addressed.

If issues or new functional needs are discovered, startups tend to be open-minded about changing their focus based on the feedback, Montgomery adds. "With startups, you have a considerable opportunity to help them shape and form development of their solution or their product roadmap," Montgomery says.

For companies who don't have an innovation lab or team, it's still possible to work effectively with startups, says Montgomery, though proving out and piloting a new technology is still needed. "You have to be very focused on how you are going to set up the proof of concept so you can thoroughly test the technology without impacting your operational productivity and delivering on what your customers are asking you to achieve in your facilities," says Montgomery.

Jerry Pimental, CEO and owner of Paladin Supply Chain Solutions, a consulting firm, agrees that proving out emerging tech is a necessary step, since solutions from young startups may not be fully formed. "It comes down to one basic concept: With a proof of concept, you gain knowledge," he says. "You identify all your questions and you start answering them, so you have the knowledge to say: This is going to work, and this is what we can expect from the technology if we deploy it further."

For startups, working with end user companies on POCs and pilots is not only a real-world proving ground, but helps them gain development direction. "For the startups, it's an opportunity for them to develop their technology into a more workable, focused solution," says Pimental, who, in a long career as a supply chain executive, has worked with multiple startups.

ROI still matters

In the cost-conscious world of DC operations, return on investment (ROI) still matters, even with solutions from startups. Pilots still need to show outcomes like a reduction in labor resources needed, space savings, or increases in throughput without adding headcount. The difference with startups, says Roger Counihan, chief revenue officer for CognitOps, is that the costs tend to run lower compared with major DC projects centered on more established, fixed warehouse automation systems, while the ROI timelines can typically be measured in months rather than years.

"There is a hard return, but what you typically see is that the scale is brought down on cost, and the time to benefit is more rapid," says CognitOps' Counihan (he is the brother of Julian Counihan). "With startups, you're not investing $20 million to get back $80 million in value over the long lifecycle of a system or major project. You might invest $150,000 to get a $500,000 return within 18 months."

CognitOps is a startup, founded in 2018. Its software uses AI and machine learning to automate some key decision making for DC managers. Counihan says this lowers deployment risk for its users, in that the software is more of a decision automation platform, rather than an execution-level system directly responsible for getting orders out the door.

But in general, CognitOps' Counihan adds, users deploying emerging technology should keep in place a legacy system or process until the production readiness of the new technology is proven. "If you're working with a startup, you want to leverage the advantages of that technology as soon as you can, but in a way that is low risk for your mission-critical processes," he advises.

To some extent, organizations that have a low risk tolerance and don't have a track record for successfully taking on new technologies may struggle in working with a startup, says Galluzzo, compared to companies that have already successfully worked with startups. However, he adds, most of these concerns are addressable with careful road mapping on how to test, pilot and deploy a technology.

Startup vendors can also build confidence among potential users by building ties with integrators or established system vendors whose solutions the startup's technology needs to interoperate with.

To that end, Galluzzo says, part of what IAM Robotics does is use an internal simulation software tool to allow users to see how a robotic workflow will function, and how it will interact with other systems and inventory. "We've become experts in modeling robotic system deployments and building simulations to accurately model return on investment for our customers," he says.

The relatively rapid deployment timeframe of newer technology like AMRs acts to lower risk, agrees Sidell, but end-user companies should take care to vet startups, assess the fit of the technology to functional gaps, and also craft aspects like service levels and support into agreements.

But speed and flexibility of most of this startup technology goes a long way to reducing risk. As Sidell notes: "If I've got an 18-month payback with a solution, I'm OK from the user perspective even if the startup gets acquired or goes in a different direction, because you have achieved payback, as well as knowledge of what the technology can do." ∎

Roberto Michel is a senior editor at Modern Materials Handling, a sibling site to Robotics 24/7.
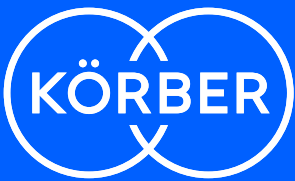
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How Warehouse Operators Can Find the Right

ROBOTICS FIT

BY ROBERTO MICHEL

To find the right robots for your operation, best practices include having a solid handle on internal data like product dimensions, order profiles, and peak requirements.

Robots are hot in warehouses right now, with strong double-digit growth projected by most analysts over the next few years. There's a big difference, however, between knowing that robotics has market momentum, and knowing how to properly scope an automation solution.

The dilemma with scoping robotics for a distribution center (DC) is that plenty of "it depends" are involved in finding a good fit. It depends on what warehouse workflow you want to automate. It depends on order mix and volume, product dimensions, layout and labor considerations. That said, if you back up from these parameters, some best practices emerge around knowing operational priorities, having a handle on data like stock-keeping unit (SKU) dimensions, and being clear about the problem.

"The No. 1 step is to look at what the dynamics of your business are, and where you might use robotics to improve your operations," said Dwight Klappich, vice president of supply chain research at Gartner. "From there, you examine specifics like what's the nature of the materials that need moving or handling, because moving a pallet with robotics is going to send you in an entirely different direction than doing collaborative picking of small items."

Indeed, an operation can leverage many types of robotics, from fully autonomous lift trucks that can heft a pallet, to relatively small, aisle-based, collaborative mobile robots that guide humans through efficient picks. There are also goods-to-person mobile robot systems as well as robotic picking arms and associated software capable of picking "eaches" for e-commerce fulfillment.

While some robotics applications, like horizontal transport of a pallet, are fairly straightforward, others are more complicated and may involve an interplay of robotic systems, cell design issues, and the need for software tools to help users visualize performance and integrate with other systems. Particulars like dimensions, SKU velocity, or how many lines are typically in customer orders will influence what the best choice is, noted Klappich, as can whether the DC is new or a brownfield site.

"If you're trying to retrofit robotics into a site with existing rack infrastructure that you don't want to change, that can be an important factor," said Klappich. "All these questions, as well as the fact that different robotics vendors might solve the same problems in different ways, are complexities many companies struggling with."

Know your data

A good first step is knowing your SKU and order data, which sounds simple enough, but often isn't, given frequent changes to SKUs and significant demand volatility this past year.

"Factors like dimensionality matter with robotics, and vendors are going to ask questions about order mix and the order velocity of your different SKUs, or about warehouse layout, like how wide your aisles are," said John Santagate, vice president of robotics with Körber Supply Chain, which offers automation and warehouse management systems (WMS) and partners with multiple robotics vendors. "The more prepared a customer can be to answer those types of issues, the better when looking for robotics solutions."

However, added Santagate, a prospective user operation needs to be ready with questions

for robotics vendors, such as:

- In what type of DC environments and workflows has your robotics offering been most effective and why?
- How can your system scale to handle my volume peaks and my more normal volumes?
- For third-party logistics warehouses, how does the robotics solution accommodate multi-tenancy?
- How can a single fleet of robots support picking or other tasks on behalf of multiple clients?

To really understand the nuances between similar robotics offerings, it's typically best to talk to multiple vendors and get them to explain how their systems offer a significant advantage for the workflows you want to concentrate on, Santagate advised.

"The vendors should be ready to define their points of differentiation, because for different customers, or even for the same customer for different workflows, those points of differentiation will help you identify where the best fit resides," he said.

Other best practices include talking to a trusted third-party expert for guidance, said Santagate. Keep in mind that you may need more than one type of robotics to accommodate different types of inventory and workflows, just like a DC might have more than one type of fixed automation.

"I think the future involves distinguishing, within the four walls of your DC, what is the best fit type of automation for different segments of inventory," said Santagate. "Don't try to force fit one solution into every segment or scenario."

Match robots to processes

Scoping out an appropriate robotics solution requires a solid understanding of order profiles and expected throughput levels, dimensions, inventory days on hand, as well as considering labor availability and productivity expectations, said Andrew Benzinger, business development manager at AutoStore, a robotic order fulfillment provider.

Other strategic drivers like DC network plans and the need for more space can also influence your robotics approach, as can a major shift to more direct-to-consumer e-commerce fulfillment, he said. A combination of factors may be drivers for automation. Once a company identifies what it wants to accomplish, it's a matter of assessing data such as the order profile, throughput requirements, and available inventory on hand to properly configure a robotics solution.

"When we work with a new customer, we first understand why they're reaching out in the first place to identify what they are really seeking to address, that's step one," Benzinger said. "From there, you have to get a feel for the data—it's best to fully understand the size of each product, the days on hand for each item, and the throughput volumes. It's very important to understand what the current state is, what the operational key performance indicators are, and how effective those processes are, to understand the value the automation will create."

With AutoStore's cube storage automation, dense storage of bins with robots on top of a grid storage structure retrieve and present bins to workstations or "ports" that can be operated by team members or robotic picking arms. Benzinger explained that robotic piece-picking software has advanced rapidly over the past 12 months, with about 12 DC sites in the U.S. that are pairing up AutoStore deployments with various picking arms.

The size of the cube and number of bins, the number of robots on top, and the number of ports on the side are all configurable elements, he added. They tend to vary by site depending on factors like dimensions, order volumes, and how many days on hand of inventory are in the DC for goods that go into the automation. "We lean heavily on experience and statistics to devise an appropriately sized system," Benzinger said.

Another best practice is to size a robotics setup that can scale up to handle

peak volumes, but not be underutilized the remainder of the year. The robotics vendor should be able to help establish tactics such as adding workstations or robots, said Benzinger.

"An understanding of the peak-to-average ratio for an operation is really helpful to determining how big the system should be," he explained.

Start simple, but start

While prospective robotics users should be ready with answers on factors like product dimensions, layout and order profiles, robotics is flexible enough that with the right approach, its benefits can be tapped into quickly.

Rick Faulk, CEO of Locus Robotics, said his main piece of advice for managers contemplating use of mobile robotics is to start a project, since the technology is quick to deploy and can be acquired through robotics-as-a-service (RaaS), with very limited setup costs. "Just get started, and don't be fearful of disruption," said Faulk.

Locus Robotics' collaborative multi-robot picking system uses existing storage and shelf infrastructure, he added. The Locus bots can reduce worker travel and increase the picking productivity by a factor of two or more, Faulk claimed. Thus, picking requires little or no change to storage, though it does typically call for some consideration of the impact of greater productivity on downstream processes, such as pack-out stations, he said. Such assessments can be done without getting bogged down with months of study, Faulk asserted.

"Some folks may think that with deployment of robotic solutions, you've got to reinvent the wheel and start all over, and that it's going to cost you millions of dollars, but that's just not the case," he said. "Our advice is to look at what makes sense for your operation, keep it simple, and start automating without making a lot of infrastructure changes. Then over time, you can adjust some processes and make the solution better."

To support fine-tuning of its solution, Locus conducts regular health checks on factors like picker productivity, slotting, throughput and other factors, leveraging a "heat map" view of activities the robotics software generates. Faulk explained that with these heat maps, rapid implementation, and periodic reviews, an operation can quickly see results without a drawn-out, traditional pilot program.

"We think of them as initial deployments rather than pilots," he said. "We'll do a full deployment, then look at the data two weeks in, 30 days in, 60 days in, and on a quarterly basis thereafter to optimize the system," Faulk said. "The approach is more about continuous optimization, and not so much about running a pilot."

No robot is an island

For piece-picking robotics, having a handle on product dimensions and weights, as well as throughput and SKU velocity requirements, is a crucial aspect of properly scoping a solution, and so is the design of the picking cell, according to Erik Nieves, CEO and co-founder of Plus One Robotics, which offers vision software for piece-picking robotics.

"If you are a new user, you have to ask practical questions like, 'Where am I going to put this robot?'" said Nieves. "'Is it going to fit?' A bunch of brownfield versus greenfield type questions need to be asked."

For success with robotic picking, throughput goals should heavily influence your choice of

robotic arm, since the lighter-duty collaborative robots can't pick as fast as a bigger industrial robotic arm, said Nieves. The size and movement of a robotic arm and its weight will influence cell design, he added, so time spent on figuring out what arm is needed and close attention to cell design will help ensure that pick-and-place automation will have a smooth implementation.

"Any automation, even robotics, is still automation, so you still have to go through some degree of an engineering exercise," said Nieves.

The ability of a robotics solution to manage exceptions is an important area to investigate with piece picking, he said. For instance, the same SKU may now has different packaging, which could cause problems picking a SKU that was easily picked before. The robotic software, Nieves adds, should be able to spot and resolve exceptions quickly.

Plus One Robotics' vision technology allows for remote monitoring and support of the cells, so if a robotic arm gets perplexed by what it sees, the system notifies a "crew chief" support person from Plus One, who can remotely resolve issues. If the problem is physical in nature, like a ruptured carton or spilled contents, remote support can alert on-site maintenance personnel.

A robotic piece-picking solution should have some quality control functions built in to ensure proper placement to avoid problems downstream. For example, some of Plus One's applications use a second camera to ensure correct placement.

"We can use a second camera for inspection, before we release that order downstream," said Nieves. "We function as our own closed-loop quality control in these applications."

Software steps up

Robotics vendors not only have software layers to help with fleet operations and path optimization; they also increasingly have dashboards and analytics that can be useful for managers. That makes asking about software functionality as important as hardware issues like payload capacity.

"If you are a new user, you have to ask practical questions like, 'Where am I going to put this robot? Is it going to fit?' A bunch of brownfield versus greenfield-type questions need to be asked."

— *Eric Nieves, CEO, Plus One Robotics*

Vince Martinelli, head of product and marketing at RightHand Robotics, said technology has matured to a point where vendors and users are putting more emphasis on the operational considerations of running robotics at scale successfully. As a result, vendors are putting more emphasis on tools that help provide feedback on issues like any SKUs that are taking longer to pick than usual.

Martinelli explained a robotics cell may do just fine at picking a variety of SKUs into a tote, but the robotics software also needs to know how to properly place or arrange items into that tote to conform to downstream constraints or system considerations.

For example, an operation may want to have totes filled to a certain height to avoid items spilling out of the tote when conveyed
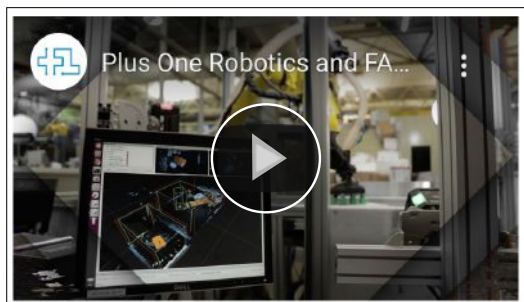
on an incline. Doing that requires software intelligence to govern how the robot should place multiple items in a tote, or other situations like how to best place items into a moving tray, said Martinelli, so the sophistication of the "place" functions of a robotic picking solution can be just as crucial as the picking aspect.

"You don't want the items to start to pile up randomly in a tote and create a tower of items that is prone to problems when the tote starts moving," he said.

RightHand also offers software tools and reports to let an operation know if any SKU being picked is taking longer than normal or experiencing failed picks, so operations managers can investigate whether something has changed with the SKU, its packaging, or the way it's being presented.

It could be that upstream from the robotics cell, a tote full of SKUs is now getting packed more tightly than before. This can pose problems for a piece-picking robot, whereas a human picker could use two hands to get an item out of a tightly packed tote.

At 6 River Systems (6RS), which offers collaborative mobile robots that work alongside human pickers, the software has grown to include an overarching set of analytics and visibility functions.

"It's an intuitive cloud-based control center that can be used [not only] by supervisors in the warehouse, but also by executive staff in supply chain operations," said

Fergal Glynn, vice president of marketing at 6RS.

To make robotics work well over the life of the system, visibility and management tools have become increasingly important, he said, especially if it can do things like adjust the priorities of the robotic zone mid-shift if the analytics indicate that orders aren't going be ready for a carrier pickup or miss some other deadline.

"It is real-time visibility, because the data is being generated by the robots and the pick activity happening on the warehouse floor," said Glynn.

Operational effectiveness

Mitch Hayes, vice president for retail and e-commerce at Swisslog, agreed that having solid data on issues like product dimensions is essential to scoping the

Picking Dashboard: a real-time and forecasted view of your operation to help you hit SLAs.
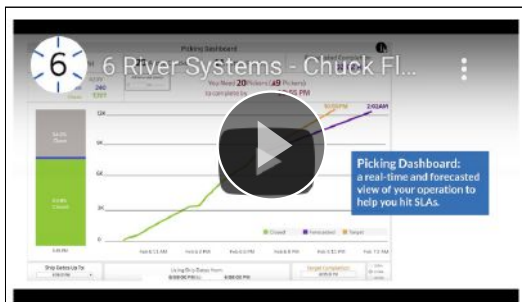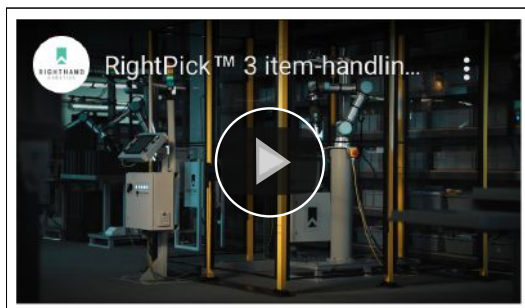
appropriate robotics. He noted that it's also wise to assess the vendor's industry track record and software functionality to address exceptions such as bins that come up short on inventory.

An operationally effective robotics system should be able to communicate with a WMS to trigger actions like cycle counts and any needed inventory corrections, said Hayes. Companies considering warehouse automation should ask about the exception handling between the robots and the WMS, or between the robots and the warehouse execution management (WEM) software. This calls for industry expertise from the vendor and software that addresses functions like opportunistic cycle counts.

"Robotics is more than what a robot arm moving at X speed or able to handle this size or weight item," Hayes said. "There are also operational considerations to address."

It also may be that a DC operation could benefit from more than one type of robot, which increases the need for pro-

viders that can work through interoperability among systems.

"Users need more than robotics technology—they need a vendor who can act as a chief engineer or a guru who can understand the metrics and data important to

each system, and what the inputs and outputs should be for a robotic solution," said Hayes.

If all of this sounds like a lot to chew on, it's because it can be, acknowledged Klappich. To cope with the complexities of knowing what robots fit well different

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— *Mitch Hayes, VP for retail and e-commerce, Swisslog*

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workflows or sites, as well as how they need to interact with the rest of the systems in a warehouse, Klappich said, some companies are beginning to create robotics centers of excellence (COE).

Such a COE would be a group of people within a company who've worked with robotics and also understand operational issues, and can guide managers. Some companies might even create a "chief robotics officer" to oversee the COE.

"The talent for these centers of excellence for robotics would be like a three-legged stool, with expertise in IT, engineering, and business and operations," said Klappich. "Some companies are already moving in this direction. They recognize the need for an organization that can work with the business to align them with robots that would match up with their specific needs, and then can help them introduce a solution and support it." ∎

Roberto Michel is a senior editor at Modern Materials Handling, a sibling site to Robotics 24/7.

PROMAT OFFERS NEW AUTOMATION FOR SUPPLY CHAINS, MANUFACTURERS

BY PHIL BRITT

Robotics suppliers showed their latest systems to help warehouses and factories at the virtual conference and trade show.

ProMat DX this spring included exhibits, keynotes, and educational sessions for manufacturing and supply chain professionals from over 140 countries. Among them were numerous discussions around robotics and automation.

This year's ProMat was different from previous conferences and trade shows. The materials handling event had been co-located with Automate at McCormick Place in Chicago for several years, but after the last in-person event in 2019, the organizers of the two events decided to go their separate ways. ProMat 2021 was also virtual, but organizers said they expect to return to Atlanta for Modex 2022 (the events alternate years). Here are some of the highlights in robotics from ProMat DX :

Siemens introduces conveyor drive

Siemens introduced the Sinamics G115D drive for horizontal conveyor applications. The motor, drive, and gearbox are all in one unit that can be wall-mounted or motor-mounted.

The drive system includes a high protection class—up to IP66/UL Type 4X—making it suitable for harsh environments, according to the company. The Sinamics G115D can also operate reliably over a temperature range of -22 to 131 degrees Fahrenheit (-30° to 55°C), so it can work in extremely hot or cold conditions, such as those found in the logistics, aerospace, automotive, and food and beverage industries.

Power for the drive ranges from 0.37 to 7.5 kilowatts (0.5 to 10 hp) for wall-mounted applications and 0.37 to 4 kilowatts (0.5 to 5 hp) for motor-mounted applications. Siemens added that Sinamics G115D is integrated into its entire MindConnect portfolio and is compatible with MindSphere applications such as Analyze MyDrives for cloud-based analysis.

Mobile robots multiply at ProMat DX

Robotics 24/7 has covered many of the announcements around autonomous mobile robots (AMRs) from ProMat DX, including IAM Robotics' Bolt, Seegrid's Palion trucks, and Tompkins Robotics' partnership with GreyOrange. We've also covered inVia's Robotics-as-a-Service (RaaS) offerings, Vecna Robotics' Pivotal orchestration software, and Caja Robotics' work with Advanced Handling Systems.

Companies supplying robots for supply chain and automation raised more than $1.7 billion last quarter. Why all the interest around AMRs? Thanks to technical advances, they can improve safety, productivity, and serve in different functions,

explained Mike Harper, vice president of sales and marketing at Chelmsford, Mass.-based AutoGuide.

"With our MAX-N AMRs, not only can facility operators feel confident the robots they're deploying can work safely around their employees, but they can also know that these robots have been successfully deployed in some of the largest and most complex facilities in the world," he said. "These facilities are seeing safer environments and faster ROI [returns on investment] as they free their workers for higher-value tasks."

In addition, Chicago-based JBT Corp. showed a warehouse freezer AGV (automated guided vehicle) to address similar needs to Siemens' conveyor drives above.

"The freezer is the last frontier for AGVs. As a part of a food machinery company, our market research indicated that nobody was servicing this market," said Cory Flemings, global sales director at JBT. "So JBT took on this challenge: We produced and fielded an AGV that can live in a freezer, service 10-ft., 6-in. aisles and reach storage locations up to 422 in."

Mobile Industrial Robots ApS demonstrated its expanded lineup of AMRs, including the more nimble MiR250 and the heavy-duty MiR1000. Geek+ showed its RoboShuttle C200M, which is designed to operate in narrow aisles, saving warehouse space.

Also at ProMat DX, Toyota Material Handling introduced a line of AGVs including automated guided carts (AGCs) and automated forklifts.

Mobile manipulation has posed several challenges, including safety and power management, but Waypoint Robotics has teamed up with Productive Robotics to offer the Vector AMR with the OB7 collaborative robot arm.

Picking solutions

Stoecklin Logistics unveiled its robotic case picker, CO-PRO, designed to relieve human employees of the repetitive task of lifting heavy crates and cartons. It automatically moves them directly from pallets to a conveyor or robotic system. Its patented universal gripper holds up to 66 lb. and can transfer multiple units for higher throughput.

"As the volume of cases in the extended cold chain continues to grow, companies will need to have even more automation in their fulfillment systems to effectively and economically move orders from processing and distribution centers through to stores and customers," stated Danilo Potocnik, head of sales for the U.S. and Canada at Stoecklin. "CO-PRO addresses one of the biggest pain points in the product-handling flow by eliminating most labor from and simplifying the fulfillment process, resulting in faster throughput and fewer errors."

ABB Robotics showed off its IRB 390 FlexPacker, a four- or five-axis delta robot that it said is up to 35% faster, with a 45% larger working volume than the earlier model. The five-axis capability increases application flexibility for secondary packaging. ABB is positioning the robot for the retail-ready packaging (RRP) market, in which products are placed vertically and for high-speed, high-variance, parcel-sorting applications.

The IRB 390 includes NSF H1 foodpgrade Lubricants and built of FDA compliant material, suitable for use in hygienic environments. FGO and FGG (H1) is used in all exposed gearboxes and bearings.

"With the launch of the new IRB 390 FlexPacker, ABB will be able to offer an enhanced portfolio of automation products to help our customers meet the latest pick and place challenges," said Marc Segura, managing director of consumer segments and service robotics at ABB. "We are combining the speed, payload and dexterity of FlexPacker with the proven high-speed picking and packing capability of FlexPicker and the advanced vision and digital twin capability of PickMaster Twin to help our customers make their lines more flexible than ever before, to

> "The freezer is the last frontier for AGVs. As part of a food machinery company, our market research indicated that nobody was servicing this market. So JBT took on this challenge."
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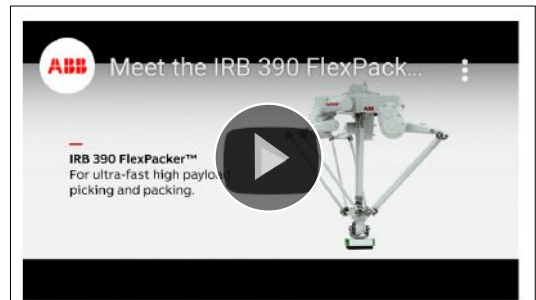handle the growth of low-volume, high-mix, and higher-payload production."

In other robotic picking news, RightHand Robotics Inc. has updated its RightPick 3 system.

"RightPick 3 achieves an unprecedented level of autonomy, with flexibility to execute multiple warehouse tasks reliably, despite the inherent variability of picking processes," stated Yaro Tenzer, co-founder and CEO of the Somerville, Mass.-based company.

Other automation at ProMat DX

SICK showcased the nanoScan3, which is claimed is the "world's smallest-profile laser scanner on the market." The company also discussed 2D lidar localization as a supplement to the mag-

netic and optical guidance systems for AGVs and AMRs. SICK also provides sensors for stationary applications, such as bin picking.

Berkshire Grey, which is merging with a special-purpose acquisition company (SPAC), promoted its e-commerce fulfillment, smart store replenishment, and dynamic parcel sortation offerings.

Reading, Pa.-based EnerSys offered virtual product demonstrations at ProMat DX of its EnSite modeling software and power management tools. ∎

Phil Britt owns S&P Enterprises in the Chicago area and contributes to Robotics 24/7.

AUTOMATE FORWARD
Robotics Vendors Show Latest Products at Virtual Event
BY PHIL BRITT

ABB, ACIETA, AND DORNER WERE AMONG THE COMPANIES ANNOUNCING & DEMONSTRATING PRODUCTS AROUND AUTOMATE FORWARD 2021

Automate Forward, the virtual version of the biennial Automate conference and trade show, was held in March. The in-person event had been co-located with ProMat at McCormick Place in Chicago for several years and would been held in Detroit for the first time. Automate Forward provided an opportunity for integrators and users to learn about robots and automation for a variety of applications.

Despite the virtual environment, the show still drew more than 270 exhibitors, including the top robotics suppliers serving the supply chain, logistics and manufacturing industries, according to the Association for Advancing Automation (A3). More than 40 keynote and panel sessions are available for viewing live or on demand. Since floor space wasn't limited as it is at a traditional trade show, exhibitors could show as much of their products and services as they wanted on video, and they offered online chats with company representatives for further information.

A3 also announced that it is rebranding itself. On April 14, the four A3 associations—the Robotic Industries Association (RIA), AIA (Advanced Vision + Imaging), Motion Control & Motor Association (MCMA), and A3 Mexico—converged into the Association for Advancing Automation.

Established and younger robotics companies alike showed off their wares in conjunction with Automate Forward.

ABB displays new logistics offerings

ABB Robotics introduced new robots to aid with logistics and a new monitoring system to ensure that robots are serviced before they break down.

The company's IRB 390 FlexPacker flexible delta robot is designed to support customized packaging, vertical packing, and high-speed, high-variation sorting, as well as on-demand order picking in logistics and e-commerce fulfillment centers.

Consumers are starting to have multiple options for receiving goods, including home delivery, click and collect, in-store collection, and, more recently, robotic street kiosks. As a result, distribution centers need robots that can work with a variety of package sizes and shapes in the shortest time possible, ABB said. Operators need the right infrastructure for maximum flexibility that can pick and handle a wide variety of goods in the widest range of combinations and in the shortest possible time.

Distribution centers need their robots to be operational with minimal downtime to meet tight logistics schedules. ABB's new Condition-Based Maintenance (CBM) service, announced at Automate Forward, is designed to create a preventive maintenance schedule for individual robots or fleets based on real-time operational data.

> "Users [can] also gain a better understanding of exactly which robots may have an increased risk of component failure, for example."
>
> *— Antti Matinlauri,*
> *head of product management, ABB*

The service shares real-time data on robot operations to help identify any problems that could affect performance, including duty, speed, acceleration, and gearbox wear. These variables are compared against other robots in ABB's worldwide robot database to calculate the likelihood and timeframe of a potential fault or failure.

"By providing greater predictability around maintenance and repair schedules, our condition-based maintenance service allows customers to get the most from their installed robots," said Antti Matinlauri, the company's head of product management. "Customers can now optimize their production efficiency by eliminating unexpected downtime caused by failures or delays in obtaining spare parts to fix a fault."

"Users will also gain a better understanding of exactly which robots may have an increased risk of component failure, for example, if they are over-utilized compared to others in a production line, or if heavy payloads are causing the robot to operate outside of its recommended design parameters," Matinlauri said.

Acieta unveils manufacturing cell

Acieta announced its FastLOAD CX1000 collaborative expandable robotic cell, which is mounted on a mobile platform so it can be quickly set up at different machines around a shop. The system is equipped with a FANUC 10 kg, 120V collaborative robotic arm and can be outfitted with up to three modular carts to handle a wide variety of parts.

"The FastLOAD CX1000 is pre-engineered to meet the most common machine tooling needs so it's ready for delivery and installation within one week," said Jake Corning,

Acieta product manager. "With the benefits of higher throughput and lower operating costs, users see a return on investment in six to 12 months, based on two shifts."

The FastLOAD CX1000 has a small footprint and doesn't require safety fencing, so it takes up approximately 80 percent less floor space than a traditional robotic cell, according to the company.

Dorner discusses ERT250 Pallet Conveyor

Also at Automate Forward 2021, Dorner hosted a webinar about its new Edge Roller Technology (ERT) pallet conveyor. The ERT250 is designed to provide low back pressure accumulation, non-contact zoning, and conventional transport—without a conventional conveyor belt. The open roller design can enable social distancing, is easily reconfigurable, and is rated for clean rooms, said Dorner.

FTA vision system intended for automotive assembly

ABB's new Dynamic Assembly Pack for Final Trim and Assembly (FTA) uses real-time vision cameras on the robot gripper and arms.

They are integrated with force-control sensors to enable the robot to precisely track the position of a car body as it enters the workstation for adding seats, doors and other parts.

The technology is designed to eliminate problems with vibration of automated guided vehicles (AGVs) or conveyors and variations in the speed of the production line. To compensate for any unexpected movements or vibrations, once the car body reaches a predefined position, the Compliant Vision Guidance (CVG) camera on the robot arm scans it for consistent reference points such as door edges, taking 30 to 40 images per second to determine whether the attachment point is where it should be and whether any adjustments are necessary. ∎

Phil Britt owns S&P Enterprises in the Chicago area and contributes to Robotics 24/7.