Man + Machine: The Future of Fulfillment

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Robots have been buzzing in our collective consciousness for a very long time. If you count their predecessors, the automatons (from the Greek automata, or "mechanical device that works by itself"), they go back to the 13th century.



Machines that imitate (or outdo) humans have been the subject of fascination and mistrust all along. One of the most intriguing and scandalous examples was the chess-playing Mechanical Turk in the 1770s, which was apparently an automaton able to beat any chess master. It turned out to be a hoax — there was a man hidden inside. But in a way, it presaged the true future of robotics, because it combined human and mechanical capabilities. Indeed, in today's distribution center, with the availability of far more sophisticated technology, some of the most dramatic benefits are achieved when humans and robots work in symphony.

"We look at it as collaborative robotics," says Rick Faulk, chief executive officer of Locus Robotics. We are making humans more effective rather than replacing them. In fact, we're making their jobs a lot easier."

We Need Robots

Fulfillment centers across the country face an urgent need to get more efficient. The mainstream press is full of horror stories about what happens when you push humans to pick, pack and ship more and more inventory. On top of that, the rise in e-commerce means a greater rate of returned goods, which are traditionally more of a headache to receive, unpack and put back in the warehouse. Add to that the lowest unemployment rate since 1969, which translates into dire labor shortages in crucial areas where retailers have positioned their DCs, and you have a serious problem. Even if robots

were limited to the same capabilities as humans, they would be an attractive proposition.

The truth is that we need robots. But they don't just fill in labor shortages and shift-length gaps. They present significant advantages that, combined with human brain and brawn, make for a far more efficient operation that improves the lives of workers, too.

Labor in Peak Seasons

Start with labor levels. Not only is there a huge demand for warehouse workers, it gets concentrated in regions and around peak periods. "Demand is very regional," says Mike Johnson, president and chief operating officer of Locus Robotics. "There are key places in the country and the world where there's a need for warehousing in order to serve e-commerce and stores. They become hub-spots, and fulfillment companies center around them. They're not necessarily in cities where the workers are. They're more likely to be somewhere like Monroe, NJ. You get a thousand warehouses built, and the demand for great people is very, very high and you can't find the people."

Johnson points out that e-commerce is growing at 15% per year. "There's a million people working in warehousing," he says, "and if you're adding 15% every year to that, then you're adding 150,000 people annually. That's impossible. That's the key problem we're solving."

Robots, it turns out, don't mind living in New Jersey, and you don't have to wait until they turn 18 to put them in a warehouse. You can also move them to where they're most needed without having to look into school districts.

That makes them perfectly suited to coming in temporarily when there's a peak like the one around Black Friday.

"We can bolster your fleet with what we have in the marketplace," says Kary Zate, director of marketing communications at Locus. "We bring in what we call 'surgebots' to help people handle spikes in volume when they can't get enough labor. That helps you get where you need to be with your existing workforce."

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"They're shipped yesterday, they arrived today, and they're working now," says Faulk. "With humans, you have to hire them, train them, and put them into the human-resources system. Robots can scale up instantly."

Robots Don't Get Tired

Robots have other capabilities that distinguish them from humans. They can lift heavier loads and traverse miles all over a facility without ever getting tired. "It's tough working in a warehouse," says Johnson. "Folks are walking 10-12 miles a day." Robots can be designated to travel the long distances while human workers stay within a smaller area, working together.

"People get stressed, and automation makes their life easier," Johnson points out. "They're not pushing huge carts around."

Another advantage is that robots plus humans can receive and obey instructions faster and better than humans alone. This leads to significantly increased efficiency, which also answers a pressing market need.

"Operators say they're under pressure to produce more with what they have," says Johnson. "They need to double production, and shorten cycle times." At one typical customer site, it used to take two days to turn orders around. Now, it's down to one day. "That's a huge win."

"In many of our sites, when they put robots in, they produce more," Johnson says. "They keep their people, but double the capacity of the site. So it's about bolstering labor capacity, but it's also about taking an existing facility and producing more."

Another market pressure is the trend to fulfill e-commerce, wholesale and retail orders from the same facility. That presents enormous complexities — just the sort of thing robots are great at handling.

Changing the Game

Then, of course, what happens when all those orders are fulfilled? Returns! They present their own, special challenges that robots can help with. Recently, Locus introduced robots with putaway functionality, designed specifically to handle the reverse picking motion involved in putting items back on the shelf

instead of taking them off. "These are usually disparate objects from a variety of different returns," explains Zate. "They can be destined for completely different parts of the warehouse. With our system, the 3PL or retailer or omnichannel operation just gives us that order, and we'll make sure it gets back to right place."

It's a huge improvement for workplace conditions, Zate says. "Put-back is usually done during the graveyard shift along with restocking. Now we can eliminate the need for that second shift." A worker can be operating with one robot that's picking orders, and another that's restacking inventory in the same place. "That means that worker can do not one, but two functions seamlessly."

"Another thing that sounds simple, but it's strategic, is that robots can process orders in very dynamic ways," explains Faulk. For example, retailers often demand that orders arrive at the store with, say, each item of clothing grouped into small, medium and large, or women's separated from men's. "Before, you'd have to walk all over the building to build that order, because inventory is never ordered that way," says Faulk. "But with robots, walking is free. They enable strategic picking that was never before feasible. That makes fulfilling orders much more efficient."

All in all, we're just at the beginning of exploring what's possible when we augment human workers with robot helpers. "We're making things happen that were never before possible in a warehouse," says Faulk. "We're moving toward digitizing the interaction between humans, machines and warehouse management systems in a way that's providing dramatically more insight into what's going on in that building."

Faulk cites the example of a warehouse manager who can now get a view of the entire facility on his or her smartphone. "I'm not exaggerating," he says. "You can see the entire operation — where picks have to be done, where they've been done, the efficiency of each warehouse worker, where robots are in real time. It's actually quite addictive!"

Allaying Worker Worries

Despite all the clear advantages, there are still cultural hurdles to be overcome. "Often a worker's first impression is, 'I'm going to lose my job,'" says Jasmine Lombardi, chief customer officer at Locus. "That's always top of people's minds." She says Locus customers often ask the company what they should do to prepare associates for accepting robots in the warehouse. "We have a program to help them. We work very closely with the HR and internal communications department to help dispel those fears."

Tools for smoothing the introduction of robots into the workplace include a Q&A sheet addressing typical concerns. Locus also suggests holding a "town hall" meeting to announce the kickoff of the robotics project.

"We help them explain, 'This is what the robots are going to look like. This is why are we doing this,'" says Lombardi. "We help customers pitch it to their workers as something that's going to improve their lives by making their jobs easier, not take those jobs away."

Locus will even ship a robot in advance of implementation, so workers can touch it and see what it looks like. Workers can also see videos that show exactly how the robots will share space with them.

"People fear the robots are going to hit them," says Lombardi. "We show them that robots mean they won't be heaving carts around with heavy RFID devices strapped to their wrists. They work hands-free with a very easy interface via touch pad. The robots can interact with workers in 13 different languages, using Bluetooth technology to read tags worn by a worker to automatically determine which language they speak.

"We're not just making people feel comfortable around robots," Lombardi says. "We also want to make it fun. A lot of sites have robot-naming competitions, where they suggest a name and win a prize for the most popular one."

Lombardi explains that it's also important that workers aren't left alone with robots when they start picking with them. "We have core teams that walk alongside the workers to check they're OK. Usually, after a couple of hours of training, they say, 'I'm good now.'"

Lombardi describes an encounter with one female worker she met at a new Locus site. "I asked her how she liked it. She said it was fun and not nearly so much work as before, because she doesn't have to push a heavy cart with nine totes around narrow aisles while wielding a three-pound screen. She said she's really enjoying coming to work. She has twins at home. She said, 'This is the easy part!'"

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Locus Robotics,
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