Inside an Amazon Warehouse, Robots' Ways Rub Off on Humans

By Noam Scheiber

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The last person to touch an item at an Amazon fulfillment center is the packer, whose job is to stick each order in a box and tape it shut.

As with most jobs, being a packer is more complicated than it looks. Michael Waterman, a packer at Amazon's Staten Island warehouse, told me that when he started, he would grab each piece of tape too quickly, and it would invariably stick to his gloves. He ruined two pairs in his first two days.

Later, he overcompensated by waiting too long, at which point the tape had lost its stickiness. Only after some experimentation did he find the sweet spot.

And yet, being a packer isn't *that* complicated. When I asked Mr. Waterman whether he had run into similar problems in other aspects of his job — like figuring out how long a piece of tape to use — he demurred. "The right amount of tape will always come out," Mr. Waterman said, referring to the automatic tape dispenser at his side.

Michael Waterman, a packer at the warehouse, had to master how to grab tape without getting it stuck to his gloves. Measuring the tape is left to an automatic dispenser.
Hiroko Masuike/The New York Times

My trip to Amazon's Staten Island center had its origins two months earlier. I was writing about a former worker named Justin Rashad Long, who contended that he had been fired for speaking out about working conditions there. Beyond the claim of retaliation, Mr. Long said laboring at Amazon had been a tremendous slog: Employees worked long shifts with few breaks. Managers held them to unreasonable goals. The time they spent waiting in line at metal detectors — to discourage theft — lengthened their day.

The company disputed these allegations, in some cases with extensive data. It invited me to come see the place for myself. (Amazon gives public tours at certain fulfillment centers, but not on Staten Island.) So, in mid-May, I spent a

few hours observing workers and asking them about their jobs, with a press chaperone in tow. By the end, I had concluded that both sides had a point.

The workplace, with more than 2,500 full-time employees, seemed more humane than the picture Mr. Long painted. The general manager, Chris Colvin, knew many of his employees' names and bantered with them amiably. The workers, in turn, seemed invested in the company. The center had recently held a contest for their children to illustrate job safety practices, like bending at the knees and wearing gloves. A few dozen drawings were still on the wall.

But underlying Mr. Long's charge was the idea that Amazon treats workers as if they were something less than people — that its obsession with optimizing fulfillment centers for a world of one-day delivery requires a system of stifling routines, rules and metrics. That system can make workers feel patronized and spied on. It can crowd out personal initiative.

There seemed to be something to the picture Mr. Long painted, though the problem may be less with Amazon than with technology itself.

Software Looks Over Your Shoulder

Every day, about 50 truckloads of merchandise turn up at the warehouse's receiving dock. One group of workers unloads the goods, and another group — known as "water spiders" — distributes them to work stations. There, a third group, known as stowers, transfers the items onto what are called pods. These are large shelving units that hold several dozen bins, which are attached to robots that move through the building.

Of the entry-level jobs at Amazon, the stower's arguably provides the most room for decision making. Stowers choose the bin where they want to place each item, keeping in mind that they should make the task as easy as possible

for the worker, known as a picker, who will have to grab items out of the bin. Stowers should, for example, avoid obscuring one item with another. "Our customers are the pickers," a stower named Jing Zhang told me.

Mr. Zhang seemed like a state-of-the-art Amazon employee — someone who saw the world through the eyes of a manager. "I try to find ways to make me more efficient," he said. He figured out how to reduce wasted movement by unpacking the box closest to the shelving unit first, then replacing it with the next-closest box, rather than wandering to and from other boxes.

Still, even Mr. Zhang and his fellow stowers must work with Amazon's software looking over their shoulder. If a stower attempts to stick, say, a bottle of sunscreen in a bin next to one that already has such a bottle of sunscreen in it, the bin will light up to signal that this is not allowed. Adjacent bins with identical items can confuse the pickers. The same thing happens if a stower tries to put heavy items too high on the pod, or too much weight on either side.

After the pods are full, the robots move them across a large caged area. If an item falls down along the way, or a robot stalls, a worker on what's known as the amnesty team will venture into the cage to sort it out. The worker wears a special vest that allows the robot to detect his or her location and stop before it gets too close.

This turned out to be relevant in Mr. Long's case. The company said he had once reached too far into the robot area, in violation of safety protocol. Mr. Long said this was a pretext for his firing.

It's hard to know who's right. On the one hand, the safety rules can seem excessive. But from inside a fulfillment center, you begin to appreciate the rules' urgency.

If an item falls or a robot stalls, a member of what's known as the amnesty team will sort things out. A special vest identifies the worker, prompting the robot to stop before getting too close.
Hiroko Masuike/The New York Times

Watching an amnesty worker walk among the robots can feel a bit like watching a zookeeper mingle with lions. You know this is a trained professional who will probably walk in and out of the cage without incident. Yet you can't help wondering: What are the chances that this person gets mauled?

A Gentle Game of Whac-A-Mole

Picking inventory off shelves to fill customer orders is usually the most common job at an Amazon warehouse, and the company has worked for years to make its pickers more productive.

At many warehouses, pickers walk miles each day in search of items, but algorithms provide them with the optimal route.

In the so-called robotics fulfillment centers like the one on Staten Island, the pickers are stationary and the robots deliver items to them. The company says these warehouses account for "more than 50" of its roughly 175 centers worldwide.

The robots have raised the average picker's productivity from around 100 items per hour to what Mr. Long and others have said is a target of around 300 or 400, though the numbers vary across teams and facilities. The robots help explain why Amazon managed to ship more items than ever during last year's holiday season with about 20 percent fewer seasonal workers than the year before. (Amazon said another reason was that it was focused more on permanent hiring in 2018.)

Robots have also made the job far more repetitive. Unlike pickers in manual warehouses, the pickers on Staten Island have almost no relief from plucking goods off shelves, other than their breaks. A picker named Shawn Chase said he motivated himself by competing with a friend in a different part of the warehouse to see who could earn the higher productivity ranking.

"Last week I was 41st in the building," he said. "This week I'm trying to be top 10." The company has taken this logic even further in a handful of warehouses, The Washington Post has reported, creating video-game interfaces that allow workers to accumulate points and badges for completing these tasks.

Amazon has periodically fueled rumors that it plans to fully automate picking in the near future, even sponsoring a contest for engineers who develop robotic picking arms. But the truth is that human pickers will be around for years.

According to Russ Meller, who runs a group that designs warehouses at the engineering consulting firm Fortna, it would be hard for a robotic picking arm to navigate the shelving units that carry goods around Amazon's warehouse. The shelves are too large a target, and the bins may be too cramped or too deep. "They really complicated it for the robot," said Mr. Meller.

In effect, Amazon calculated that there was so much productivity to be gained from reducing the millions of miles its workers walk each year that it was better off finding robots well suited to moving goods all those miles, not worrying whether the system would later be compatible with robotic pickers.

The difficulty of automating pickers puts pressure on the humans to become more productive. "We try to eliminate any wasted movement," LeVar Kellogg, a picker who trains other pickers at an Amazon facility near Chicago, told me. "If you have one second that's adding to the process, it doesn't seem like a lot. But if you do that 1,000 times a day, that's when it starts adding up."

Sometimes these are strictly physical movements whose elimination almost no one would mourn. In other cases, the steps being removed involve thinking, too. Pickers at robotics facilities consult a monitor displaying a picture of the next screwdriver or watch or bottle of vitamins they're supposed to grab, as well as its location on the shelving unit's grid of bins. Some pickers have developed techniques for remembering this location, like yelling it out loud — *3F! 4H!* — so they don't have to glance back at the monitor multiple times.

But at the Amazon center on Staten Island, there is no need to remember the bin location. The bin holding the needed screwdriver or watch or bottle of vitamins simply lights up, turning the exercise into a gentle game of Whac-A-Mole.

This steady stripping of human judgment from work is one of the most widespread consequences of automation — not so much replacing people with robots as making them resemble robots. "The next pod comes, and a pod comes after that, and after that," Mr. Long told me. "All day till you get off."

A former worker at the Staten Island center portrayed the workplace as one where workers feel patronized and spied on. But in interviews, few seemed nostalgic for their old jobs.
Hiroko Masuike/The New York Times

At Walmart, The Washington Post recently reported, machines are deciding when produce has become overripe, then summoning humans to replace it.

Or consider trucking. For generations, the typical trucker took pride in serving as the captain of the ship: deciding when to start and stop each day, the best way to reach a destination, how to deal with maintenance.

Today, trucking companies have removed much of this decision making from truckers, relying instead on algorithms that monitor fuel efficiency, idling time, location, braking and acceleration, and maintenance needs.

As with picking, trucking may be fully automated one day. In the meantime, said Karen Levy, a sociologist at Cornell University who has studied the trucking industry, "what you end up doing is making people better cogs."

Upsides, and Acts of Resistance

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Few of the workers said they were nostalgic for their old employers. Mr. Chase, the picker with top-10 ambitions, said that his previous job, sorting mail for the Postal Service, had been "very tedious" and that his current work was fun by comparison.

Among the others I met that day were a former Uber driver, a former tollbooth cleaner and a former assistant deli manager at a supermarket. All said they had better health benefits at Amazon and made more money. Entry-level workers on Staten Island start at $17.50 per hour or more and get a raise every six months.

Mr. Waterman, the packer, previously worked in the frozen-food department of a grocery store. He said that in addition to earning better wages and benefits at Amazon, he appreciated having a more predictable schedule, and the way managers try to train struggling workers.

When I asked whether he could see any benefit to a union, Mr. Waterman told me, "The biggest benefit is job security." He quickly added, "The managers here, they don't want to fire people — they just want people to work hard."

Professor Levy said workers facing employers preoccupied with efficiency often found ways to resist. She recalled a trucker who had figured out how to play solitaire on the computer that the company installed in his cab. "It was a

super meaningful way for him to preserve a little bit of decisional autonomy," she said.

Amazon workers, too, have resorted to small acts of rebellion. Near the entrance of the Staten Island center was a wooden cart with a big pile of bananas. A sign announced that the bananas were free ("Yes, *Free*!"), but with a caveat: "Please, take just one at a time," the sign said. "Don't go Bananas."

I was standing about 15 feet away when I saw it: A woman walked by and grabbed two.