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Technology

Warehouses Are Tracking Workers' Every Muscle Movement

By Joshua Brustein
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Every morning when he goes to work in the freezer room of a warehouse in eastern Pennsylvania, Jack Westley throws on a hooded sweatshirt to keep warm and grabs a radio to talk to his coworkers. He was recently given a new piece of equipment to wear, which he attaches to a harness over his shoulders. It's a black device about the size of a smartphone that tracks his every move.

For Westley, a 36-year-old with tattooed arms and a sunny disposition, work means a full day of carrying boxes as ice slowly forms in his beard. The freezer is one of the more treacherous areas, according to the warehouse's management, in part because workers get sloppy when they're cold. So each time Westley bends too deeply to pick up a box or twists too far to set one down, the device on his chest vibrates to send a warning that his chance of getting hurt is elevated. Westley noticed he'd developed a habit of bending at the waist as he reached far into pallets to pull out boxes. "That might've been something they would vibrate on me for, but I started walking around to the sides of the pallets, you know, thanks to the reminder," he says.

Jack Westley
Source: Geodis

The device, made by a startup called StrongArm Technologies Inc., also sends the information it gathers about Westley to his employer, Geodis. The warehouse in Breinigsville, Pennsylvania, where Westley works is one of a handful of locations where Geodis is testing StrongArm devices. They are also in use at facilities operated by Walmart Inc. and other companies. Geodis says the trackers could supplement existing safety programs by identifying employees who need extra coaching, while also helping single out locations in its operations that should be redesigned to reduce the chances of injury.

Unions and researchers who study workplace surveillance worry that employers who begin gathering data on workers for whatever reason will be unable to resist using it against them. Productivity tracking is already widespread throughout the industry—and workers can be fired or punished if their performance dips. The opacity of data-analysis tools can make it difficult for workers to fully understand how much employers can see.

StrongArm says it has about 30 clients, including Heineken NV and Toyota Motor Corp., and is also establishing relationships with insurance companies interested in ways to reduce workers compensation costs. Walmart says it's testing StrongArm in eight distribution centers and adds it has no plans to use them in stores. StrongArm says about 15,000 workers have worn its devices, and most of them use it daily. The Brooklyn, New York-based startup expects to have 35,000 daily active users by the end of next year.

StrongArm acknowledges that concerns about workplace surveillance surround its work, but the company says its products are designed solely to improve safety and cites a recent study it commissioned that

found users wearing them suffered 20% to 50% fewer injuries. It says it's not tracking individual productivity and that its products aren't used to punish individual workers or to contest workers compensation claims.

But ergonomic tracking isn't happening in isolation. Geodis uses productivity tracking software made by another company and gathers data about its operations in other ways as well. Mike Honious, the chief operating officer for the Americas at Geodis, says it could one day combine all this data into a single system so it can improve both safety and efficiency. He waves off worries about surveillance: "I actually believe they're emotional concerns."

Sean Petterson, the founder and chief executive officer of StrongArm, could lay a roof on his own by the time he was 12 years old. His education started at the knee of his grandfather, an engineer for the Long Island Railroad who invented a rotating television antenna and several other gadgets. Later, Petterson accompanied his father to job sites for his construction company. "I loved the labor of it," he says. "The gratification of work itself was ingrained in me when I was a little guy."

StrongArm Founder Sean Petterson in Brooklyn, on Nov. 4.
Photographer: Gabriela Bhaskar/Bloomberg

Petterson decided as a child he wanted to be “an inventor.” The inspiration for StrongArm came at the age of 14, when his father was killed on the job. Petterson declined to discuss the event in any detail, saying only that there are “way, way too many things that could have happened that could have avoided that, if people were just more aware.”

StrongArm started in 2012 when Petterson was a junior at the Rochester Institute of Technology. Initially, his idea was to build exoskeletons to enable manual laborers to lift heavy objects safely. In an attempt to quantify how much of a difference the suits made, the company began building a system of sensors and software that would track the motions of people wearing it. StrongArm soon realized there was a much larger market for the tracking system.

StrongArm devices charge in a docking station at a warehouse.
Photographer: Michelle Gustafson/Bloomberg

In Petterson’s estimation, most employers lacked an understanding of what was actually happening in their warehouses and factories, leading to suboptimal safety decisions. Managers walking the floor were limited to correcting issues they actually saw, and people tend to straighten up when they see the boss nearby. A comprehensive analysis of everyone’s physical activity would provide the basis for a more rational approach to safety, Petterson reasoned.

At one client's site, recalls Petterson, StrongArm noticed that there was a single location in the warehouse where workers were frequently twisting their backs too far, a motion associated with significant injury risk. The employees there stood alongside a conveyor belt, watching for certain items and sending them down a set of rollers that intersected with the belt at a 90-degree angle. StrongArm advised the company to change it to a 45-degree angle and to replace the rollers with a powered conveyor belt, so workers didn't have to push the boxes themselves. The problematic movements immediately dissipated.

In another facility, management asked StrongArm to look into high rates of attrition among temporary workers. During initial conversations, managers had said they suspected the temps were just lazy. Instead, StrongArm found they were overexerting themselves by lifting boxes at four times the rate of full-time staff, according to Petterson. "They were worried about not keeping their job," he says. StrongArm told the company, which Petterson declined to name, to put those workers on a slower conveyor belt and hire the ones who proved themselves.

A StrongArm Fuse device worn at the Geodis fulfillment center.
Photographer: Michelle Gustafson/Bloomberg

Petterson uses the anecdote to demonstrate how StrongArm can serve as an advocate for workers. But it also validates a fear that ergonomic data can highlight how fast or hard people are working. "Surveillance

is usually multipurpose, and the same technologies can be used for both positive and detrimental ends," wrote Alexandra Mateescu and Aiha Nguyen in a report this year for Data & Society, a research group. StrongArm says that most of its clients are already gathering productivity data through other products, and so the use of its technology should raise no new concerns about surveillance.

Traditionally, unions would be a check on troubling use of monitoring technology, says Nguyen. But today's increase in data collection comes at a time when a decrease in collective bargaining has altered the power dynamics in the workplace, she says. StrongArm says it operates in some facilities with unionized workers. Petterson declines to name them but says the unions have been supportive.

That wasn't true for Adam Kaszynski, who was a shop steward for local union IUE-CWA 201 at a facility that ran a StrongArm pilot. General Electric Co. asked workers at its aerospace plant in Lynn, Massachusetts, to wear equipment from StrongArm last year. "I tried to convince everyone not to do it," says Kaszynski. "It's creepy as hell. They have no business knowing that information."
Kaszynski, now president of Local 201, says he suspects data collected by any tracking device would eventually be used to force employees to work faster or to challenge workers compensation claims. GE workers who agreed to wear the devices soon stopped, Kaszynski says. Alex Teller, StrongArm's executive director of clients, acknowledges the pilot program was unsuccessful, although he says union leadership at the time supported it.

Sometimes employers using StrongArm's products have taken steps to quell privacy concerns on their own. When Toyota began planning a pilot with StrongArm, it intended to use the products to compare individual workers so it could identify those who were exhibiting behavior associated with higher injury risk. But the automaker retreated from that plan by the time its pilot began last month in Princeton, Indiana. The automaker says it's still interested in doing so in the future.

StrongArm's current model gives wide latitude to its clients, which own the data the devices generate. But Petterson says he would object to the use of his technology to punish workers and would consider restricting a client's access to data if such a case arose. Kaszynski questions whether it's even possible to separate safety from performance in the warehouse. "When you work with your body, ergonomic data is productivity data," he says. "They want to do more with less. They want workers to work faster, longer and increase production while mitigating workers comp claims. That's, I mean, clearly what this is about."

When StrongArm devices started to roll out at Geodis this year, rumors quickly spread through the workforce that the devices had cameras and microphones. The company dispelled such fears, while trying to coax workers into participating in the program, telling one group that their managers would personally serve them lunch if everyone participated in the pilot. This mollified workers like Westley, who is so

unconcerned with the tracker that he occasionally wears it home at night by accident. “I don’t even notice it’s there anymore,” he says.

Workers at Westley’s facility make initial wages of $12.50 to $15 an hour. They can earn as much as $5 more per hour if they exceed certain quotas, and Geodis uses a system separate from StrongArm’s to monitor workplace productivity. Employees who underperform can be disciplined or fired, but Geodis managers say that happens rarely. The company had considered creating a similar incentive system to reward high safety scores but decided against it.

For Honious, the Geodis executive, the potential of StrongArm is about using data to redesign the company’s operations. He says it started in earnest with the ability to monitor productivity at such a granular level. “We can actually break it down by the second. Then you apply the ergonomics data to the exact same timeline, and you can see the motions of the person bending, and what they’re doing,” he says. “Then all of a sudden from there you can look at, ‘OK, is there an opportunity? Do we have a little bit of idle time? Was there some lifting that caused the operator to slow down?’”

Like most logistics operators, Geodis is looking for ways to automate jobs it currently hires humans to do. The company says the best way to improve safety sometimes involves removing people from parts of the operations where they’re most likely to get hurt.

Petterson also sees automation as a worker safety issue. “When someone comes in and says, ‘We’re the automation consultants,’ we want to be able to point to the areas that just spike up as red on our map,” he says. “And we say, ‘This. This is the place.’”