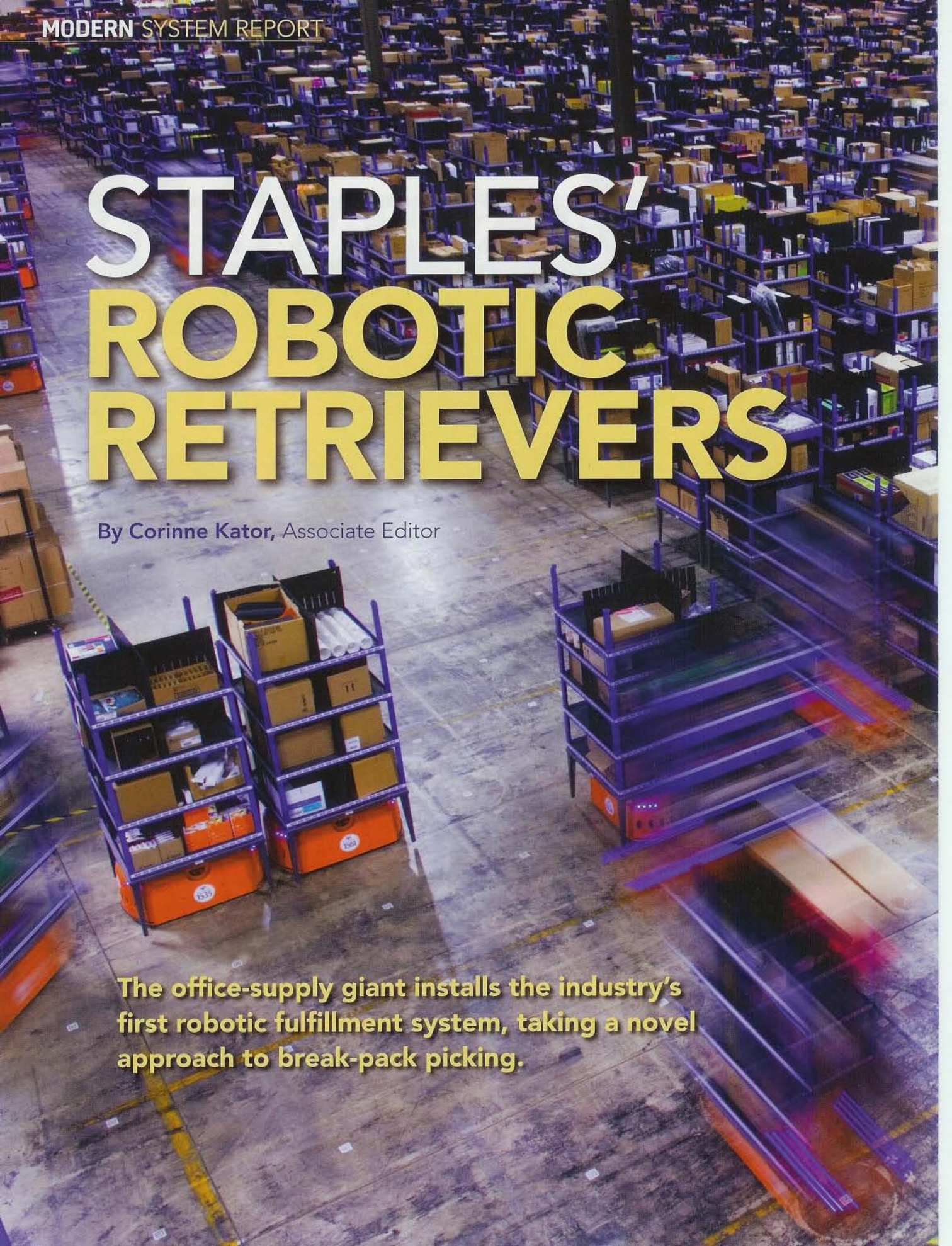



STAPLES' ROBOTIC RETRIEVERS

By Corinne Kator, Associate Editor

The office-supply giant installs the industry's first robotic fulfillment system, taking a novel approach to break-pack picking.





EACH PICKING. PIECE PICKING. SPLIT-CASE PICKING. Whatever they call it, most companies find picking and shipping individual items hard to do cost effectively. Staples—the world's largest office products company—is no exception. There, picking individual items to fill online and catalog orders is known as break-pack picking. And, according to Roger Will, vice president of transportation and logistics planning and engineering, it's a challenge.

"The break-pack pick module is the pinch-point in throughput in our DCs," he says.

Staples uses pick-to-light systems in a few of its break-pack operations, but most of the company's facilities, including the one in its 500,000 square foot Chambersburg, Pa., facility, are conventional pick-and-pass operations:

- paper lists direct picking in the facilities' pick modules, and
- conveyor lines carry away finished orders for shipping.

The Chambersburg facility is one of the best in the Staples network, says Will, but

when it was time to expand the break-pack picking operation there last fall, Staples decided not to add more pick modules and conveyor.

Instead, the company installed a radically different fulfillment system in which robots bring inventory to order pickers.

Today, the robotic fulfillment system (Kiva Systems, 781-221-4640, www.kivasystems.com) operates alongside the DC's original pick-and-pass operation. And according to Will, the robotic system gets more than

George Turano, fulfillment center manager

twice the throughput per picker than the conventional system. The new equipment is performing so well, he says, that Staples plans to replace the remaining conveyor system with a robotic system this fall, making the

Staples made the decision to invest in the robots one step at a time

storage locations:

- reserve storage locations that store cases on pallets, and
- forward storage locations that store opened cases for picking.

Like most DCs, the Chambersburg



break-pack operation in Chambersburg entirely robotic.

Taking risks

How did Staples decide to become the first company to make the leap from conventional distribution equipment to a robotic fulfillment system?

“We think we have one of the leading supply chains in the office products industry,” says Will. “If we want to stay in the lead there, we have to take some risk.”

But this risk, he says, was a calculated one. The 7,500 boxes routed through the robotic system in Chambersburg represent just 5% of the company’s daily volume. And when the robots went live, the conventional system next door provided a backup.

Staples made the decision to invest in the robots one step at a time, says

Small orange robots pick up shelving pods to deliver them to order pickers.

Will. First the company ran a pilot project in its Dallas DC, outfitting an open mezzanine with a small robotic system for testing. Only after the tests proved successful did the company commit to the partial Chambersburg installation.

Now that the robots have been successfully handling live orders in Chambersburg for nearly a year, Staples will expand that system and install a larger robotic system in a DC under construction in Denver.

How it works

Like most break-pack operations, the Chambersburg facility has two types of

facility uses rows of steel pallet rack for reserve storage. But the DC has no flow rack or static shelving traditionally used for forward storage. Instead, the center of the DC is filled with small, lightweight shelving pods.

When an order picker needs to pick a product from a shelf, she doesn’t walk there as in a traditional DC. Instead, a small orange robot picks up the shelving pod and carries it to her. After the pick is complete, the robot returns the shelving pod to forward storage while another robot delivers the next pod to the picker.

Easy setup and operation

The new equipment was a breeze to set up, says George Turano, manager of the Chambersburg facility. Five days after he turned his cleared DC floor over to

the supplier, the system was up and running.

So far the robots have required very little maintenance, he says. The two-dimensional bar code stickers that guide the robots as they move across the floor occasionally wear out and need to be replaced, and the imagers on the bottoms of the robots that read the bar codes need periodic cleaning, but that's simple compared to the upkeep for a conveyor system, Turano says.

The robots even take care of charging their own batteries. They drive themselves to charging stations in the center of the DC for brief opportunity charges during the day, and they give themselves a deep charge while the DC is closed over the weekend.

"It's a simple system," Turano says. "It's a simple idea. I'm sure it's complicated behind the scenes, but for us to run it, it's easy."

Setting up and maintaining the software that controls the system has been only slightly more complicated, says John Kessler, regional vice president of fulfillment and delivery operations. For the supplier to setup the software, he says, Staples had to provide detailed information about its operations, including all the stock keeping units (SKUs) in the system, the velocity of the SKUs, the days of supply Staples wants to keep on hand and the size and weight of each item.

Because Staples was already using a warehouse management system to manage its break-pack inventory, however, these data were fairly easy to compile.

The supplier has been issuing software updates quite frequently, says Kessler, but he expects these to come less often as the robotic system becomes more widely used. Part of

being the first customer, he says, is helping to work out the bugs.

The benefits of robots

Kessler and Turano agree that one of the biggest benefits of the robotic system is the working environment it provides for order pickers. The system is quieter than the conveyor system; it requires much less walking; and it gives order pickers more control over their work.



The robots in Staples' facility charge their own batteries and require little maintenance.

"On the conveyor line, they were only picking part of the order," says Turano. "Now they're doing the whole box." This means order pickers never have to wait on someone else, and they feel more accountable for the quality of their work. "They control their destiny," he says.

Training pickers takes at least two weeks in a conventional picking operation, but it takes only two days with the robotic system, Turano says. Scanning items and following onscreen directions in a picking station is a bit like using a self check-out station at a grocery store—a task most people can do with little or no instruction.


Of course, the benefits reach well beyond picker comfort. In addition to

"It's a simple idea. I'm sure it's complicated behind the scenes, but for us to run it, it's easy," says George Turano, facility manager

doubling order picking productivity, the easily scalable system has maintained Staples' high standards for order-picking accuracy. Because orders are handled one at a time, the system reduces order cycle times and easily allows Staples to expedite specific orders.

Staples isn't willing to disclose the return on investment (ROI) figures for the robots, but Will says it's as good or better than that of the company's other materials handling systems.

"It's a good ROI or we wouldn't be doing it," he says.

And while Staples isn't yet ready to retrofit all of its break-pack operations with robotic systems, says Will, "we're definitely considering it for our next new facility." 

System suppliers

ROBOTIC FULFILLMENT SYSTEM: Kiva Systems, 781-221-4640, www.kivasystems.com

PRINTERS: Zebra Technologies, 866-230-9494, www.zebra.com

PALLET RACK: Interlake Material Handling, 800-468-3752, www.interlake.com

LIFT TRUCKS: Raymond, 607-656-2311, www.raymondcorp.com

RF UNITS: Motorola (Symbol Technologies), 866-416-8545, www.symbol.com

WMS: Manhattan Associates, 770-955-7070, www.manh.com