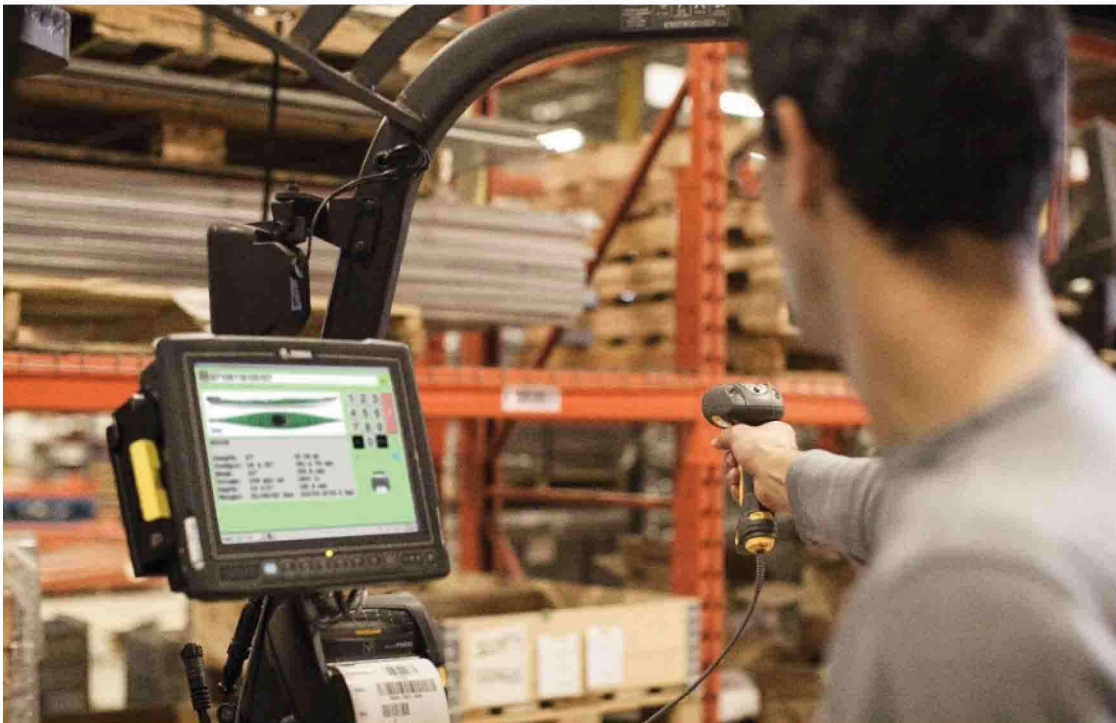# A Warehouse
Space Odyssey

New technology is bringing a sci-fi spin to the back end of the retail supply chain.

By Jenny McTaggart

← **FAR OUT**
New imager-based scanning devices can read barcodes from up to 70 feet away.

I f someone made a science fiction film about grocery warehousing, the scene might look something like this: drones flying through the air counting inventory, automated guided vehicles taking contents off trailers and putting them away, and lit-up tunnels equipped with RFID sensors, taking pristine records of every perishable product that travels through their dark confines.

This scenario might actually happen in the not-too-distant future, according to some of the grocery industry's warehousing technology pros. As well as exciting new technology applications on the market, they cite the promising integration of systems and technologies already being combined to tackle two of the industry's most pressing needs: accuracy and speed.

Today's own "warehouse space odyssey" features voice technology, wearable technology, imager-based scanners, and warehousing systems that tie into trans-

portation and labor management systems, as well as retailers' ERP (enterprise resource planning) systems, to offer the ultimate in visibility and planning.

"Accuracy and speed don't necessarily go together," notes Tod Hummert, product manager, warehouse and transportation systems for Duluth, Ga.-based NCR Corp. "We typically have to put more validation within our applications, but we try to do it in a way that doesn't slow down the users from a productivity standpoint. One of the ways we do that is by using different technologies at the same time."

One of NCR's recent developments in this arena is a clever integration with pallet jacks, which is currently being used by Associated Grocers, of Baton Rouge, La., and Merchants Distributors (MDI), a wholesale grocery store distributor based in Hickory, N.C.

"We worked with a forklift and pallet jack manufacturer to integrate voice in with the pallet jack,"

VOICE OF REASON
NCR Corp. is combining voice with other technologies to improve load accuracy.

explains Hummert. "The manufacturer then added light to the pallet jack for each pallet position. Through voice, we're sending a command to the pallet jack to light up the pallet position where the selector's going to place the product. So, as we tell a selector to go to a location, then confirm the location, we tell them how many to pick, and then we tell them to place it on position A. Then we send a command to the pallet jack to light up position A. This is just another way we can help companies to achieve even better accuracy."

In addition to this futuristic-sounding technology combination, NCR is offering automation technology through formation systems, as well as automated storage retrieval systems (ASRS), continues Hummert. "One of our larger customers that's using the ASRS is Associated Food Stores, out of Salt Lake City," he notes. "They actually have two different versions in place … a pallet-level ASRS, as well as a unit-level or case-level system. They have a large sortation system that feeds off that as well.

"Any time you can utilize automation, your productivity is going to go up, your accuracy is going to go up and your utilization within the warehouse is going to go up," adds Hummert.

By integrating different applications within its warehouse management systems, NCR can help

companies increase their productivity, he continues. "With warehouse management systems, obviously we manage the inventory," observes Hummert. "We also manage the labor, as we have an embedded labor management system within the WMS [warehouse management system] that very tightly impacts the operation. And we take advantage of the fact that it is integrated to make better decisions so that we get increased productivity. We also manage the space within the warehouse, as well as the labor itself."

In fact, Hummert says that he's seeing a lot of focus on having tighter integration with transportation on both the inbound and outbound sides of the business. "On the inbound side, it's making sure the product is coming in when you need it and having visibility to what's coming in," he notes. "On the outbound side, it's ensuring that trailers are in the doors before you need to load them and making sure you're optimizing those outbound loads not only from a cube and weight standpoint, but also from a delivery standpoint — making sure you have the right routes configured so you can reduce your overall mileage and increase the productivity of the drivers themselves."

Built for Speed
Integration is a key business goal for many third-party logistics providers as well. Reading, Pa.-based Penske Logistics sees warehousing as just one part of the supply chain that must be closely linked to other facets. "In most instances, we have integration between our customers' ERP systems and either our transportation management or warehouse management systems," notes Andy Moses, Penske's SVP of global products. "So information is coming in to us, we're doing various types of processing and transactions, and then we're normally feeding back some information into the customers' systems through these integrations."

Moses observes that the fresh channel has

Top 5 Technology Expansion Plans

Zebra Technology's latest Warehouse Vision Survey reveals transformational changes in North America for asset visibility, warehouse productivity and supply chain integration in various industries, including grocery. According to the survey, the No. 1 technology in which executives plan to increase their investment is barcode scanning.

"There's so much that could be and should be done with the barcode in a lot of operations," notes Mark Wheeler, director of supply chain solutions — North America for Holtsville, N.Y.-based Zebra Technologies. "Good, disciplined supply chain management, enforcing the use of the GS1 standards … blocking and tackling with barcodes is a huge opportunity for a lot of people."

The top tech priorities identified by the survey are as follows:

Equipping Staff With Technology	76%
Barcode Scanning	67
Tablet Computers	66
Big Data/Analytics	61
Warehouse/Truck-loading Automation	56
Internet of Things (IoT)	52

"exploded" across the food industry, and that has brought a lot of change in the way business is done on the back end. "We're seeing more frequent deliveries of fresh goods, and often front-door deliveries in the store, versus loading docks around the back of the store," he explains. "We see this as a kind of segmentation within the supply chain, as some grocers are taking smaller, fresh items and moving them out of their mainstream supply chain."

These changes have ramped up the need for speed in the supply chain, including the frequent replenishment of fresh goods.

Don Klug, VP of distribution center management for Penske Logistics, says that technology is playing a key role in how retailers are adapting to these changes on the back end of the supply chain. "One example is having slotting as a functionality within a warehouse management system," he notes. "So you slot your fast movers, or items that need to get out of the building as fast as possible, closer to the dock. Then, when you receive those products, you can put them away more efficiently, and the same goes for when you pick them."

Other newer, promising technology he mentions includes a "speedline concept," in which orders can be picked in smaller quantities for a particular store or for a particular truck route, as well as task interleaving, which is a function within the WMS that allows the user to send tasks via an RF-based system, which ultimately keeps forklifts full.

Both of these concepts help to increase productivity, as well as speed to market and even labor reduction, notes Klug. And in an economy where warehouse workers have been hard to come by, technology's power to take over menial tasks requiring accuracy has been particularly powerful.

The Mobile Edge

In addition to the impressive features being added to warehouse management systems, the hardware side of technology is seeing some exciting changes. Mark Wheeler, director of supply chain solutions — North America at Holtsville, N.Y.-based Zebra Technologies, says that "systems of reality," or industrial IoT solutions such as sensors and analytics, are helping to drive operational visibility at different processes, including yard management for trailer loading.

"As we're seeing more frequent replenishment for stores and more cold-chain requirements, it filters down to the solutions side, where we're working with customers to design new workflows and to implement them in the optimum way," he notes. "There's a major transition at the operating system level from Windows CE to Windows Mobile to Android. And there's a user interface transition that's linked to that, in which we're moving to more touch-oriented user interfaces."

In the warehouses, he sees a transition from laser-based to imager-based scanner devices, largely driven by the industry's enhanced focus on food safety, and food traceability in particular, which warrants the need for tracking two-dimensional barcodes and multiple barcodes at case level and even at each level.

Meanwhile, more people are relying on wearable scanning to confirm that they're not only handling the right product, but also handling the lot number that they allocated to fulfill from, he says.

For cold-chain requirements in particular, more suppliers are integrating temperature sensors into "smart tags" so that they can track not only the temperature of products, but also the temperatures that the product was exposed to throughout its shipment, continues Wheeler.

This past April, Zebra Technologies rolled out Smart Pack Trailer, an analytics-based solution that provides visibility into how trailers are loaded, what percent capacity is being used, what percent complete the load is and how to project the completion time on a particular trailer. All of this information is immediately available to the mobile manager in the warehouse, he notes.

"These products are always on ... always looking at processes and keeping decision-makers in sync with reality," observes Wheeler.

"Reality" is the ideal word, since the need for real-time accuracy and productivity makes grocery distribution tech anything but science fiction. **PG**

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