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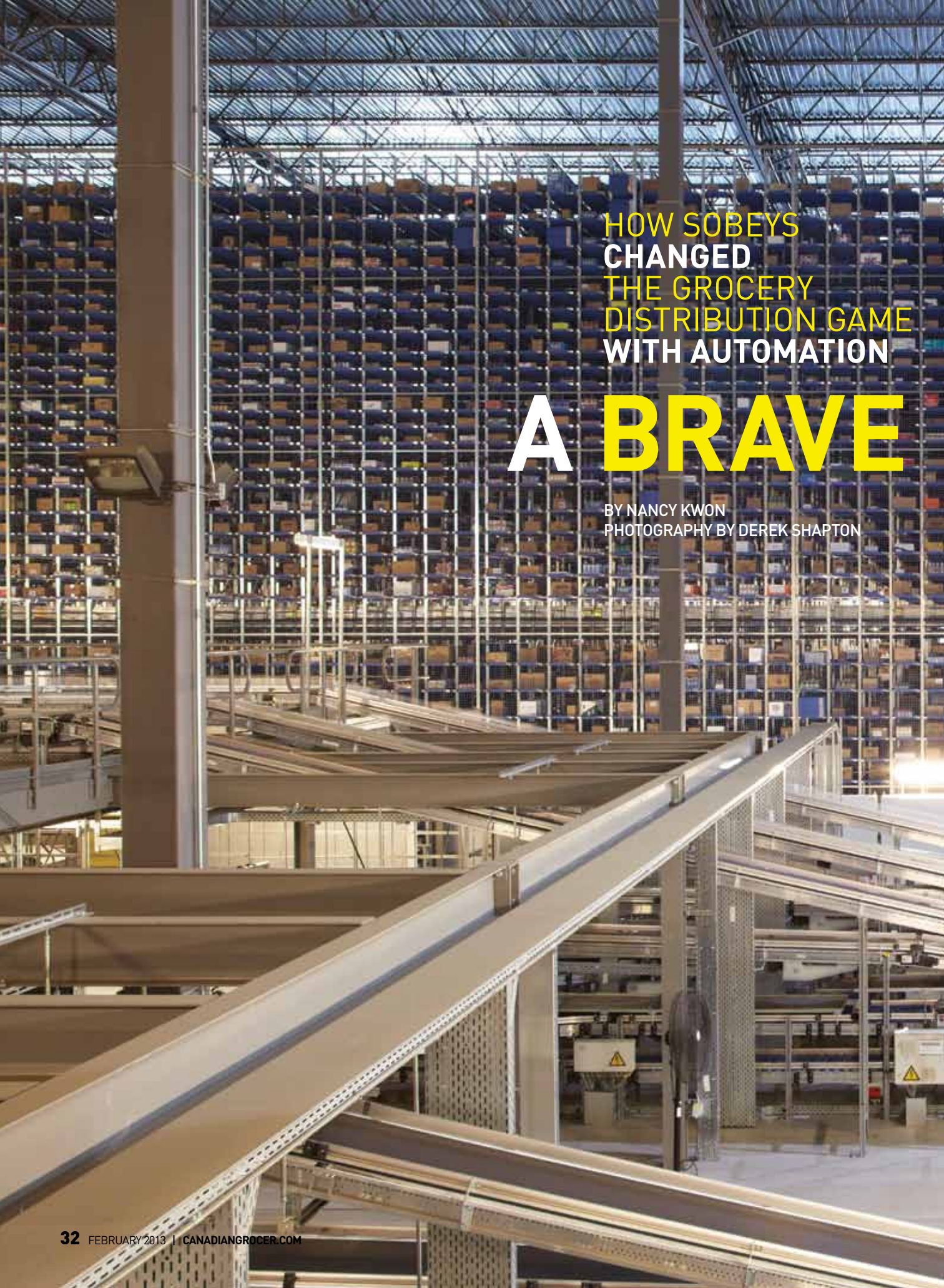
Sobeys VPs Eric Séguin and François Vimard



HOW SOBEYS **CHANGED** THE GROCERY DISTRIBUTION GAME **WITH AUTOMATION**

A BRAVE

BY NANCY KWON
PHOTOGRAPHY BY DEREK SHAPTON

NEW WORLD

Through the thick fog of an unusually balmy November morning, I peer up through my car's windshield hoping to spot the familiar Sobeys sign. No luck. I keep driving. Minutes later, there's a slim break in the grey soup. Just ahead, I see the sloping green letter "S" on what appears to be an ordinary concrete building. Hopping out of my car, I head inside Sobeys' Vaughan, Ont., distribution centre. And I'm awestruck.

It's not just the size of the place, which is huge: a half-million square feet, or eight football fields, underneath 70-foot ceilings. It's surprisingly quiet in this mammoth facility. The most interesting thing is there's almost no one around. That's because most of the work is done by machines.

Welcome to the brave new world of automated grocery distribution centres. This DC, which opened in 2009, at a whopping cost of $150 million, is as rare as warehouses come. Only 27 like it exist in the world, and a few of those are so new they've yet to be built. From the time product enters the warehouse, through picking and pallet assembly, everything is automated. The technology comes from Witron, a German logistics firm, and Sobeys is so sure of its ability to improve efficiencies and support stores that it's about to open a similar DC this spring in Terrebonne, Que.

To understand why Sobeys chose to spend mega-bucks on automation, you need only look at the grocer's main business: selling food through many different store formats. To provide those stores with better service, the retailer knew it had to lower costs and boost productivity. The Vaughan DC does all that. "The reason behind automation was to improve efficiency," explains François Vimard, Sobeys' executive vice-president.

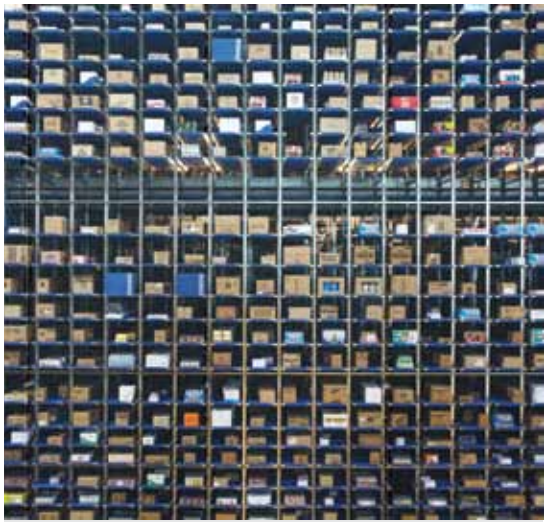
Vimard's involvement with this DC goes back long before the facility was built. In 2003, Sobeys decided it needed to improve its back-office business. Two of its big goals: improving the company's cost base while also boosting service to stores. Drilling down, Sobeys wanted a distribution solution that could work for its many different store sizes–ranging from 2,000-sq.-ft. independents, to 50,000-sq.-ft. supermarkets.

The problem with conventional DCs, says Eric Séguin, Sobeys' senior vice-president of distribution and logistics, was that Sobeys was losing out on efficiencies. Most goods it ships to stores are in case quantities rather than pallets. As Séguin explains, "this order profile is labour intensive. Order selectors have to travel to multiple locations to build a pallet." Sobeys needed a system that could flexibly service small formats as well as big ones and cut costs.

Marc Wulfraat, president of MWPVL International, a supply chain and logistics consultancy in Montreal, paints a vivid picture of the challenge the company faced to get the job done. "Sobeys has a lot of smaller stores and does a lot of wholesale business, and because of that, it's not as productive as, say, a Loblaws, where the picker is running an aisle and filling a pallet. With some Sobeys orders, they'd be running the entire warehouse to fill a pallet. The more SKUs you add to a pick path, the longer it becomes and the slower it gets."

It was during a visit to American supermarket retailer Kroger's distrubution centre in Phoenix, in 2005, that Vimard and his team found what they were looking for: Witron's Case Order Machine (COM). It "cracked the code," making automation efficient and accurate, Vimard remembers. What was so great about COM? It could automatically pick cases, no matter their

AUTOMATION NATION: (Clockwise from top left) Sortation for the COM picking; exterior view of Sobeys' distribution centre in Vaughan, Ont.; the tray storage area; trays are stored in this automated tray warehouse, with trays automatically retrieved from storage based on order demands. A separate sequencing process allows trays to be retrieved in the most efficent manner, without consideration of how the cases must be stacked on the order pallet; an order pallet is automatically stretch wrapped, then labelled and sent to be shipped to stores



size, shape, volume or package type. And thanks to specialized gripping and suction techniques, it didn't rely on complex robotics. Vimard was thrilled. "When I saw [Kroger's] Witron DC, we came back and said, 'It's so aligned with what Sobeys wants to do, we have to get it.' "

Sobeys executives soon found another huge benefit to the Witron automation system: the ability to handle an unlimited number of SKUs. In a standard grocery DC, each time a buyer adds another SKU to stores, warehouse managers have to find a new pick slot for it. "In an automated facility, however, there is no pick slot because the system is picking it out of a holding area and sending it to the station where the pallet is built," says Tim Pyne, a former VP of national logistics at Sobeys, who worked on the Witron project, and is now a VP at Tompkins International, a supply chain consultancy in Raleigh, N.C. A typical warehouse can hold anywhere from 8,000 to 12,000 SKUs. The Vaughan DC can hold one and a half times more thanks to Witron's automated case picking and palletizing system, called OPM (Order Picking Machinery).

LEADERS IN LOGISTICS: The Sobeys team heading up the automated distribution centre in Vaughan, L to R: Eric Séguin, François Vimard and Marc Coderre

Marc Coderre, Sobeys' senior director of automated distribution operations in Ontario, points out that when another store is added to the mix, it's just a matter of programming the system to pick another store. Essentially, automation allows Sobeys to offer a wider product variety than its competitors, leading, presumably, to higher market share. "This automation is really a sales engine," explains Wulfraat. The OPM system can receive 720 cases an hour (320,000 cases daily). Compared to a conventional environment where humans pick an average of 160 to 180 cases per hour, the COM can pick 500 cases. And without humans, errors and damage to goods on pallets has been effectively eliminated, says Coderre.

Though a certain amount of automation in warehouses has been around for a while, Séguin notes that the missing link was effective assembly of pallets. Indeed, this was an area where Sobeys experienced the greatest costs in its conventional distribution centres. As Pyne points out, a problem with conventional DCs is many employees work part time. Turnover can be high. "It takes two to three months before they're building a decent pallet, but this system always produces a perfect pallet: it's cubed, built nice and high, with no overhang."

The machines used in Vaughan have been proven to get eight to 10 per cent more product on a pallet using engineering software that creates, essentially, a giant 3-D Tetris game. And with the help of pistons, lift tables and conveyors, the software is able to put together pallets that are denser.

But taking a closer look at the numbers, how does this giant warehouse make sense financially? Séguin says with the Vaughan DC, Sobeys is seeing labour costs that are 30 to 40 per cent lower than a conventional warehouse. One employee now does the work previously handled by four. Wulfraat recalls Vimard, at a Witron conference a few years ago, pegging the Vaughan DC's ROI at about 13 to 15 per cent, though Vimard said at the time that companies should view automation as part of a 20-year investment strategy.

Prior to this DC opening, Sobeys operated three conventional distribution centres in Ontario–a small wholesale operation in Brantford, and DCs in Milton and Whitby. Today Milton and Whitby remain open, and handle all the fresh (meat, dairy, produce, deli) with Vaughan handling all the dry grocery goods for Ontario.

Comparing costs in a conventional dry grocery DC versus an automated one, Wulfraat says the total labour cost per case is about 40 cents in a conventional DC and the total warehouse operating expense can be in the range of 60 to 75 cents per case. For high-volume DCs that ship one million cases per week or more, such as Vaughan, the cost savings per case can be in the order of 40 per cent. That lowers the total warehouse cost per case to a range of 36 to 45 cents, provided there is enough up-front volume to justify the investment. Wulfraat believes automation is best suited for those companies that are looking ahead 10 years because that is when the savings materialize in a big way. "If I save 30 cents per case X, one million cases per week over 10 years amounts to $156 million in benefits, which more than pays back the incremental capital investment for a fully automated grocery distribution center which may be in the range of $80 to $90 million."

Apart from the sheer economics, another big difference between the Vaughan DC and a typical centre is that cases are brought to the pallet instead of bringing individual product to the pallet. "No longer [does] a picker have to drive a pallet jack two miles to pick a convenience store order with fewer cases, which isn't as efficient as if you're picking for a full-service store," Séguin

notes. "We only control the sequence, not the frequency.... By controlling the sequence, we can build store-friendly pallets." At the Vaughan DC, 85 per cent of the grocery volume is currently automated, eight per cent is semi-automated (due to packaging size and structure); and seven per cent (including repack) is manual.

The Country Grocer, an independent supermarket in Ottawa, is supplied by Sobeys. Owner François Bouchard says automation has reduced picking errors and damages for his orders. And for Sobeys stores, there's more. The planogram of every store is housed inside the Vaughan DC's warehouse management system. Pallets, therefore, can be custom built specifically for each individual store. They no longer contain products that have to be placed on five or six different shelves throughout the store. Séguin says the goal is to "build one pallet per each aisle as much as possible." When stores receive their store-friendly pallet, it can simply be dropped in the aisle, ultimately resulting in improved labour efficiency at the store. "There's no value added in moving cases around in a store," Séguin says.

The automated picking system also maximizes cube utilization in trailers, a key efficiency in transportation costs for grocers such as Sobeys. Says Coderre: "Most warehouse management systems build pallets based on product dimensions. The fact that we can put eight to 10 per cent more products on a pallet, and build taller pallets, enables us to maximize space in our trucks." Karl Hoegen, CEO of Witron, says that on average, the system reduces transportation cube volume by approximately five to 10 per cent.

So, what does the future hold for Sobeys' automated DC? In today's world, warehouse technology moves at a speedy pace. Is there a risk that, in a few years, the Vaughan DC will end up a Palm Pilot in an iPhone world? Séguin doesn't think so. Vaughan is already years ahead of the conventional distribution world. Moreover, he says, Sobeys built the DC larger than it needed to be. When current capacity is reached, Sobeys can easily boost it another 50 per cent. Plus, he says, "We have enough land to substantially increase our capacity even further by expanding the building."

Witron's Hoegen, meanwhile, adds a tantalizing future angle. His company's systems are designed to allow for additional growth capacity of software and material handling equipment. If grocery e-commerce ever takes off in North America, companies will be able to fill those requirements.

It appears now that more retailers are looking closely at adding automated DCs, and for reasons other than just efficiency and e-commerce. The population is getting older, the labour force is shrinking and it's becoming harder to find people willing to work in a warehouse environment. Brian Gibson, a supply chain management professor at Auburn University in Alabama, thinks the ROI of automated warehouses has finally become attractive enough for several major U.S. retailers to start building them. "We're going to see more automation in the distribution and wholesale areas, with big players going after it."

Sobeys, meanwhile, is gearing up to open its second automated DC in Terrbonne this spring, which will use Witron's DPS (Dynamic Picking System). That's an open-pick case system using "pick to light" technology. At Terrebonne, Sobeys will be able to change product with very little lead time so SKU assortment can be changed daily.

What's next? Perhaps automated distribution of fresh goods. Spanish grocer Mercadona already has an automated fresh DC, and stateside, Target Corp. (which Sobeys will supply with groceries when it opens its first Canadian stores, in March) will debut a robotic food and perishables distribution centre this spring, in Denton, Texas.

When asked if this is something Sobeys is moving toward, Séguin smiles. Sobeys is "always looking at options," he says. To which Vimard adds, "Before we make any decisions like that, we want to make sure that we've done all our homework and due diligence. Is it possible? Absolutely."

One thing is certain, however: By investing in automated DCs, Sobeys is likely asking itself, "What do we want to be in 25 years?" Distribution experts give kudos to the retailer for taking what they consider a giant leap. "It's the story of the decade for Canada as far as logistics go," Wulfraat says. Then he adds: "It is the most impressive distribution centre that I've walked through. It's beyond state of the art." CG

FROM PICK TO PALLET: INSIDE AN AUTOMATED WAREHOUSE

The goods enter receiving: identification, validation of quality and confirmation of quantity.

Automatic pallet high-bay warehouse: After receiving in the goods entry area, pallets are stored in an automatic high-bay DC, then transferred to an automatic layer depalletizer as required.

Depalletizing and separation: After depalletizing the layers, the cartons are individually and automatically loaded onto individual trays.

Tray loading: Trays are then automatically stored in a rack system designed for individual product storage.

Automatic tray warehouse (picking buffer): After creating the order pallets via software, trays containing the products are removed from stock and transferred to a sequence buffer for further sorting.

Picking with COM: The sequenced cartons are supplied to the case order machine, trays are automatically removed and products are pushed against pack corner plates to build the order pallet.

Pallet wrapping: Pallets are automatically removed from the pack corner, stretch wrapped and labelled. Use of a pack corner guarantees no overhang.

Shipping and dispatch: The completed order pallets are ready to be loaded onto trailers for delivery to stores.

WITRON