

BY JACK KOHANE

RADIO FREQUENCY ROLLOUT

With deadlines looming on implementation, here's a primer for food processors on the latest in logistics.

The road to Radio Frequency Identification (RFID), touted as the wavelength of the future for supply chain operations, is revving into overdrive. So why aren't food manufacturers scrambling onto the bandwagon?

It's coming and food suppliers will have to decide soon when and how they will embrace the technology, says Pam Stegeman, vice-president of Supply Chain and Technology for the Washington, D.C.-based Grocery Manufacturers of America (representing major food, beverage and consumer goods makers in the U.S.). "It will become a critical component of most supply chain networks over the next few years, especially so for manufacturers and food suppliers exporting their products across international borders," she says.

Just like what barcodes did when they were introduced over two decades ago, RFID seems to be creating more unease than elation among manufacturers. "Today barcodes

are universally recognized and accepted, and certainly RFID will be the key global tracking mechanism whenever goods move from one location to another," says Stegeman. "So savvy entrepreneurs who get in early will reap the rewards."

Fuelling RFID jitters was Wal-Mart's edict last year that put its 100 top suppliers on notice that they would have to be RFID compliant to the pallet and case level by Jan. 1, 2005 – an imperative later extended to include all suppliers with a cut-off date of 2006. The goal is to increase the company's distribution centre productivity, increase its yield per store, inject more flexibility into its vast supply chain and gain an additional point of margin by 2007. Wal-Mart has budgeted US\$3.5 billion over five years for RFID.

Other international retail giants are helping drive home the message to manufacturers and food suppliers. Tesco in the U.K. is forging ahead swiftly to introduce RFID into

its supply chain. And the German-based retailer and wholesaler, Metro Group, which operates in 28 countries and includes its Extra supermarkets division, is ramping up to implement RFID technology along its entire process chain by November 2004.

Working closely with the Metro Group in this initiative is SAP AG, a global supply chain management software solutions provider. SAP has been conducting RFID research since 1998 and is helping set industry-driven standards to support the use of RFID.

“Our RFID solution is built on the SAP web application server, part of the SAP NetWeaver technology platform,

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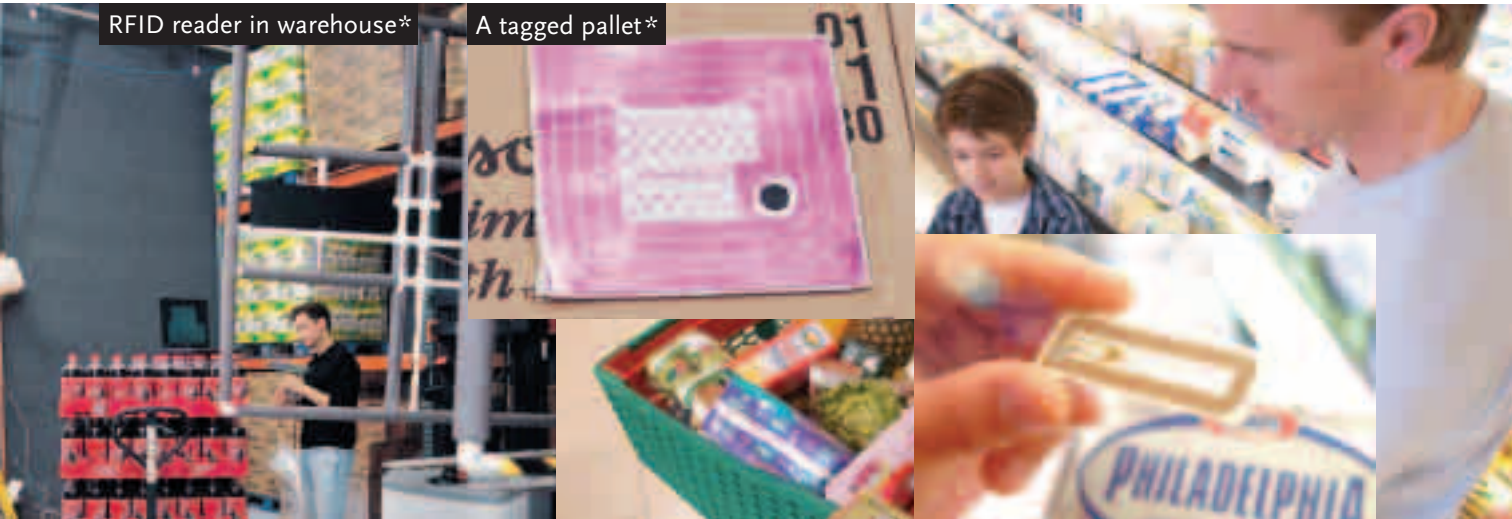
At first glance, RFID sounds like win-win news for manufacturers and retailers, and industry analysts laud its virtues. They expect RFID to shrink out-of-stocks by up to four per cent along the supply network, improve consumer and client demand forecasts by 10 to 20 per cent and slash inventory levels by 10 to 30 per cent. They envision logistics expenditures to be reduced by one per cent or more, bring in-store new product launches two weeks faster and generate higher



Wayne Regehr

RFID reader in warehouse*

A tagged pallet*



which ensures seamless extension and integration into SAP and non-SAP IT environments,” explains Wayne Regehr, executive vice-president of SAP Canada in Calgary. The program, developed to manage and communicate RFID data and use business content to automate RFID-enabled business processes, can be integrated into existing IT environments through Auto-ID connectors. “For food processors,” adds Regehr, “it’s critical to know where all the ingredients in their products came from and where they are destined. RFID allows for the flow of information to be immediate – anytime, anywhere.”

RFID isn’t new technology – it’s been around since the Second World War. Allied aircraft were fitted with radar transponders, which returned a code when hit by the incident radar beam. The planes could be separately identified from the enemy. One of its most valuable modern applications, as a tool to reduce counterfeiting and theft, is spurring on a growing horde of high-end consumer packaged goods manufacturers to invest in deploying RFID across their supply chain.

Leading the charge to make RFID more adaptable to more users is the AUTO-ID Center at the Massachusetts Institute of Technology (MIT). The centre is working in tandem with industrial partners to develop the technology that will eventually allow integration of sophisticated radio frequency systems throughout the world’s supply chain.

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sales volumes of between one to two per cent. Significant cost savings in labour are also anticipated. Within the warehousing environment, productivity improvements using RFID of between 30 and 80 per cent (depending on the level of automation in the plant) are forecasted as attainable targets. Thousands of man hours will be saved by speeding up receiving and shipping operations, in addition to almost eliminating shelf-tag and scanning errors.

The concern over RFID, notes Ted Salter, vice-president at Cap Gemini Ernst & Young in Toronto, a Canadian management and information technology consulting firm, is rooted in confusion about the technology, how it works, what it costs and its potential ROI down the line.

What is RFID? It’s like barcode identification, but rather than graphic symbology it uses electronic circuits. Essentially, a tag – a microchip with an antenna – is placed on a skid of soda crackers, a pallet of packaged frozen vegetables or a case of canned corn, and suddenly a computer can “see” it. A reader scans the radio frequency reading of physical tags on products and transportation conveyances, such as cases, pallets or re-usable containers, and provides highly precise product ID at any stage in the supply chain.

Linking RFID to Supply Chain Event Management (SCEM) systems also enables real-time decision making for more flexible and responsive supply chain execution. “That means no more inventory counts, no more lost or misdirected shipments, no more guessing how much material is in

your supply chain or how much of your product is on store shelves," explains Salter.

RFID doesn't require exact line-of-sight between tags and readers in order to be read. Most tags are resistant to extreme temperatures and other external factors and can be read and re-programmed at least 300,000 times before needing replacement.

"This is a natural fit for food processors," says Dan Odette, vice-president with Teradata in Atlanta, Ga., a division of NCR that specializes in enterprise data warehousing (the process of capturing, storing and analyzing data). "A big feature of the technology is its ability to sense any environmental changes at any point in the supply chain – crucial for food products that must be stored and shipped at certain temperatures and pressures. RFID tags can store enormous amounts of information – any and all of which affords businesses the insight to make critical supply chain decisions."

RFID also addresses the daunting challenge posed by short shelf-life grocery goods. At the moment barcode-based applications are widely used in the short shelf-life supply network. Barcoding standards have enabled sell-by dates in the codes, which has helped retain the integrity of stock rotation and reduced spoilage. But there are problems associated with barcode data collection, including manual handling in the supply chain, which is costly and labour-intensive in large warehouse depots and retail outlets. RFID appreciably boosts operational efficiencies and improves stock-level transparency at every step of short shelf-life products distribution.

Reinforced by retail "smart shelves" that are capable of reading signals from microchips to track the merchandise location, the power of this technology to rapidly trace backward to point of origin and forward to where meat, seafood and dairy products were delivered, is an obvious boon.

"RFID affords supply chain optimization to everyone's benefit, from farm gate to dinner plate," says Salter, pointing out that among the main incentives for manufacturers will be increased accuracy in packing list and invoice information and reduced product recall expenses. Other cost savings will emerge from decreased order allocation times, fewer misplaced pallets/cases and faster delivery turnaround.

On the downside, the strongest business case against RFID today is the price of the tags, currently ranging from under US\$.30 cents/tag for volume purchases of several million units to US\$1/tag. Readers run about US\$1,500 each. Tags come in two varieties: passive, which requires an electrical impulse from the reader's radio field to transmit its identifier, and active, which is more expensive because it carries more data, has its own source of power, and transmits its location without the reader. Readers, too, vary in performance profiles and price, as some models recognize only one tag at a time while others can read multiple tags.

No doubt tag and reader unit costs will continue to drop as the technology develops, but another hurdle against wider implementation of RFID is a glaring gap in global standards.



Dan Odette

Stegeman notes that her organization is working on an international strategy to reconcile the issue. "Our concern centres on establishing internationally recognized standards and message protocols around the technology," she says.

Stegeman wants to see tags and readers that can be read anywhere a product moves to, from and through.

"We're advocating a total system approach, so that a shipment of canned soup or caseloads of frozen pizzas can be tracked whether they're going from Canada to the U.S., or to Europe and Japan, thus eliminating language or geographic barriers."

Kraft Foods in the U.S. is among the first out of the chute with a decidedly global RFID perspective. For its North Lawrence, N.Y., facility, the processing giant contracted TrenStar Inc., a mobile asset management company headquartered in Denver, Colo., to supplement existing bar codes with RFID tags to track Kraft's 800-litre stainless-steel IBCs in use by Kraft suppliers. "RFID technology gives Kraft a level of flexibility and reliability that barcoding alone cannot provide," notes David Adams, TrenStar's senior vice-president of corporate strategy.

Despite all the hype and hopes hooked on radio frequency, there are some compelling caveats inherent in the technology. First, there's the pesky problem of false reads. "There's a significant learning curve associated with the technology," cautions Stegeman. "Read rate accuracy [the ability of the reader to pick up the tag's signal] is about 80 per cent, and it's going to take further research to get it up to 95 per cent."

Next, much depends on what materials the tag is placed – the reader can't receive clear signals if a product is predominantly fluid (for example, milk and soda pop). To ensure a positive ID, some manufacturers are employing a two-tag solution on a case or pallet so either transmitter can be correctly picked up by the reader.

As to the question of manufacturers' return on RFID investment, it's a moot point at this time because retailers are moving forward aggressively with the technology. The new technological applications and capabilities are evolving so rapidly that even if you set up an ROI analysis today, in a year you will likely need to develop a whole new ROI model and revisit it frequently thereafter.

And then there are the doubters. Many food processors think the technology isn't quite mature enough yet for them to jump in. But Stegeman counsels that those cemented on the sidelines, opting to delay until others roll out their RFID plans or defer until standards are formulated, are going to be caught with their shorts down while the competition sprints ahead. "Every company should be looking at their portfolio of products right now to determine which ones they will want to implement first using RFID," she advises. "This technology is here and the spoils won't necessarily go to those who wait."

Jack Kohane is a Toronto-based freelance writer and regular contributor to Food in Canada.