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Smart-tag wave about to wash over retailing

Wal-Mart, suppliers start ID chip system to track shipments, monitor stock needs for everything from shampoo to steak

By Barbara Rose
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Crates of shampoo headed for Wal-Mart's shelves will silently announce their arrival to a computer when they roll through a cavernous Dallas warehouse.

Quicker than you can say "hydrating curls," the computer will check whether they are the same crates of Pantene that rumbled out of Procter & Gamble's plant in Iowa City. If any are missing, it will issue an alert.

The first tests for this system, scheduled to kick off this month, will be an early step in a closely watched "smart tag" program that eventually will involve all of Wal-Mart's 25,500 suppliers and the 3.7 billion crates they ship annually.

A smart tag contains a chip with an antenna that communicates using radio waves.

The world's biggest retailer plans to use a network of smart tags, or radio frequency identification technology, to save billions in inventory costs while increasing sales by reducing the times when items are out of stock.

Wal-Mart Stores Inc.'s requirement that its 100 biggest suppliers start tagging shipments with RFID chips by January is the equivalent of a big bang for a fledgling industry that promises to push products faster and with greater precision from plants to consumers.

"There are so many people jumping up and down in that Wal-Mart cloud of confusion, it's really created a technology feeding frenzy," said David Adams, strategy and technology senior vice president of TrenStar, which manages containers for companies such as Kraft Foods Inc.

The sheer size of Wal-Mart's initiative, and a similar requirement by the U.S. Department of Defense for its suppliers, promises to advance a technology that one day could create an automated world of objects that communicate without human intervention.

Some possible uses: shirts telling washing machines how to launder them and frozen dinners telling microwaves how to cook them.

For now, the spotlight is on Wal-Mart's program and similar initiatives by the likes of Target Corp. and Albertson's Inc.

Consumer goods manufacturers are scrambling to figure out how to meet Wal-Mart's deadlines and how to pay for expensive systems that are still evolving. Meanwhile, tech companies are jockeying for business and leadership

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Total spending on RFID hardware, software and services is expected to hit \$2.1 billion in 2005, which is nearly double last year's \$1.1 billion, according to Venture Development Corp.

Many predict an early shakeout among tech vendors and some dashed expectations.

"We think there's a big hype bubble that's going to burst," said Janiece Webb, senior vice president and general manager of Motorola's RFID start-up, Secure Asset Solutions.

"We think the Wal-Mart initiative will take off, but it's going to go through some bumps along the way."

Wal-Mart's RFID project manager, Simon Langford, is confident the program is well on track. "It's refreshing to see how [suppliers] are approaching this. A lot of them have identified internal benefits," he said.

Privately, some grumble that the RFID initiative is all stick and no carrot.

"One of the sore points has been, 'What's in it for me?,'" said Gene Alvarez, vice president at researcher Meta Group. "The value initially is you get to retain Wal-Mart as a customer."

Others see it as an opportunity.

"I think a company is short-sighted if they look at this as just a cost," said Robert Everett, information technology director for Morton International Inc.'s Morton Salt.

Even though Morton is not under the gun to tag its shipments this year, Everett is setting up a pilot project in Morton's warehouse on Elston Avenue to see how the technology works with its products. "We want to start trying to figure out how we can use it internally to improve our own processes," he said.

Packaging giant Smurfit-Stone Container Corp. assembled an RFID team two years ago. More than half of Wal-Mart's top 100 suppliers are Smurfit customers, and the boxmaker is experimenting at its research facility in Carol Stream with ways to keep tag costs down.

Smurfit wants to eliminate labels and implant chips and antennae directly into packaging. "We're planning to be a leader in this," said Smurfit's vice president of research and development, Joseph LeBlanc.

Zebra Technologies Inc. in Vernon Hills is conducting pilot tests with Wal-Mart suppliers. Eighty-five percent of the retailer's top suppliers buy Zebra's bar-code technology, and Zebra hopes to extend its leading share in the bar code market into RFID.

The technology is expected eventually to supplant bar codes, but for the foreseeable future companies will use both.

"There's no doubt there's a lot of hype about what can be done with RFID, but beneath all that smoke there's a real fire," said Bob Cornick, Zebra's vice president and general manager of RFID. "There's real technology that can solve real problems."

The technology is not new. It has been used for years to track more expensive assets like livestock, boxcars and car parts on automakers' shop floors. Kraft uses TrenStar's RFID-equipped containers to carry fruit from suppliers to a yogurt plant in upstate New York.

The push to use RFID in the consumer world started in 1999 at the Massachusetts Institute of Technology with the development of a common language and standards.

MIT's Auto-ID Labs, backed by such companies as Procter & Gamble and Gillette Co., developed a 96-bit electronic

product code capable of identifying 268 million manufacturers and an infinite number of products.

A crate of Pantene shampoo in Wal-Mart's warehouse would communicate its code to a reader, which would relay the information to a computer. Depending on how much information P&G and Wal-Mart decided to collect and share, the network would know when and where the shampoo was made and when it shipped.

The ability to link product IDs with databases containing their life histories and whereabouts makes RFID useful for preventing counterfeits, facilitating recalls and ensuring food and drug safety.

A food company could program a system to alert plant managers when cases of ice cream or meat sit too long on a plant floor outside a refrigerated room.

Retailers hope to equip stores with RFID readers to alert managers before shelves run bare. Consumer goods-makers dream of perfectly efficient supply chains in which there are never too few or too many products.

"We want the consumer's purchase to trigger a response back to the manufacturer," said P&G spokeswoman Jeannie Tharrington. "Somebody just bought a bottle of Tide, we need to make another one."

Tags are far too expensive to be placed on bottles of detergent, but prices for the so-called passive tags that Wal-Mart requires have tumbled from more than \$1 into the 20-cent range. They will fall further as demand grows.

Tags represent a fraction of the total technology cost. A.T. Kearney estimates that a major retail chain would spend \$35 million to \$40 million to integrate the information generated using smart tags into its financial and operating systems.

The massive amounts of data RFID generates are useless without good information systems.

On the benefit side, tech consultant Accenture estimates RFID technology can eliminate 15 percent to 30 percent of missing inventory.

That's a big number in a retail industry that loses more than 1 percent of its sales annually, or more than \$50 billion, to theft, paperwork errors and vendor fraud, according to a study for the National Retail Federation.

The technology also can increase revenue by 1 percent to 2 percent by reducing out-of-stock items. Using that benchmark, Wal-Mart could increase its annual sales by as much as \$5 billion.

The benefits are less apparent for certain manufacturers.

"For a consumer goods manufacturer with a low-cost, high-volume product, the business case on the initial investment is going to be very difficult," said Ed Starr, managing partner for Accenture's supply chain practice in the Americas.

For instance, the cost of tagging inexpensive items like paper towels consumes a bigger percentage of their value than for items like televisions.

Technology hurdles remain.

The beauty of RFID is that, unlike bar codes, smart tags don't require a line of sight and don't need to be swiped manually. That means that pallets of crates could be read instantaneously.

But products wrapped in metal foil deflect radio waves, and liquids bend them. Wal-Mart's Langford said the retailer won't try to read every case when it rolls through the loading dock door. "The laws of physics don't allow that," he said.

Instead, an RFID reader will count the cases on conveyor belts.

Not every tech company is jumping into the Wal-Mart fray. Motorola has decided to focus on global logistics,

networks and data management. It's looking at complex solutions that combine RFID with global positioning and other technologies.

"You have to shake out what is really doable from the dreams," said Motorola's Jurgen Reinold, chief technology officer for RFID start-up Secure Asset Solutions.

Wal-Mart is starting to do just that.

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