RFID Gains Momentum

By Claudia Graziano

Department of Defense, DHS and FDA use radio frequency identification technology to electronically track everything from food and drugs to jeeps and military supplies.



RFID TECHNOLOGY COULD greatly improve DOD's supply chain efficiencies and lower its logistics costs, says the Pentagon's Alan Estevez.

Wal-Mart, Target and the European Union's Tesco have more in common than just being among the world's largest retailers. The three companies recently began requiring their suppliers to adopt radio frequency identification technology (RFID) to track merchandise from warehouses to store shelves.

Now government agencies use RFID tags to better track military supplies, equipment, drugs and even people. The Department of Homeland Security (DHS) and Department of Defense turn to RFID to speed the inventorying of food, clothing and military supplies, thereby reducing overall supply chain and logistics-related costs. And the Food and Drug Administration (FDA) encourages pharmaceutical manufacturers to adopt RFID to thwart drug counterfeiters that try to infiltrate legitimate distribution channels with knockoffs of name brand prescription drugs.

After the terrorist attacks of September 11, security checks held up U.S. border crossings for up to12 hours. Delays at the Detroit-Windsor crossing—where 25 percent of U.S.-Canada trade crosses—caused parts shortages, which curtailed production at many U.S. auto plants.

At DHS, the Bureau of Customs and Border Protection have turned to RFID technology and its Free and Secure Trade (FAST) initiative to help ensure the integrity of supply chain management and speed the flow of traffic crossing U.S. borders with Canada and, since 2003, with Mexico.

To get expedited clearance at border crossings, suppliers enroll in Customs Trade Partnership Against Terrorism (C-TPAT) and, in Canada, Canada's Partners in Protection. Passive RFID tags affixed to the windshields of vehicles operated by those import companies, commercial carriers and individuals that Customs has classified as low-risk let the C-TPAT-certified vehicles use FAST lanes equipped with RFID tag readers.

Today, the FAST system is used at 11 of the busiest Canada-U.S. border crossings and three Mexico-U.S. border crossings.

Department of Defense Salutes RFID

Department of Defense's phased RFID program requires its suppliers to use RFID tags on supplies it bought after Oct. 1, 2004,

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and takes delivery of after Jan. 1, 2005. The tags will help Department of Defense automate its supply chain management, eliminating errors and more efficiently tracking supplies—both while they're in transit and after they reach their destination.

In the first stage of the new policy's implementation, supplies requiring passive RFID tags will include packaged rations; clothing, individual equipment and tools; personal demand items (such as health products, writing material and snacks); and weapon systems repair parts and components that are bound for Defense distribution depots in San Joaquin, Calif., and Susquehanna, Pa. Other supplies and depots will be added in January 2006 and January 2007, says Alan Estevez, the Pentagon's assistant undersecretary of defense for supply chain integration.

"It's a significant step beyond the barcode system used to inventory goods today," Estevez says. "RFID is more advantageous because it allows you to scan 40 boxes at one time, rather than scanning each box serially."

Active RFID technology, in use at Department of Defense since the early 1990s, proved its utility in tracking critical supplies during the Iraq war, Estevez says. "When you're in the middle of nowhere, your communication tends to be limited," he points out. "Using active RFID tagging in Iraq enabled us to make sure that supplies such as ammunition, fuel and water reached our mobile troops."

Beyond providing vital visibility to the supply chain overseas, RFID technology could dramatically improve Department of Defense's supply chain efficiencies and lower its logistics costs, Estevez says. Working closely with Wal-Mart, the department is fine-tuning its RFID implementation, he says. The retailer, like Department of Defense, is planning to require many of its suppliers to incorporate passive RFID tags on merchandise shipped after January 2005.

Secure the Supply Chain

The FDA works with suppliers in the pharmaceutical industry to encourage use of passive RFID tags on pallets, cases and even individual containers to provide electronic pedigrees for drugs while they are in transit from pharmaceutical manufacturers to dispensing sites, such as hospitals and pharmacies. Unlike active RFID tags, which cost up to $100 each, the smaller, lighter passive RFID tags have no power supply of their own and are thus much cheaper—between 20 cents and 50 cents apiece.

The electronic pedigrees, which would replace the paper trail currently in place, would help manufacturers track shipments of drugs throughout the supply chain. They also could be used to identify drugs for recall, verify their authenticity, and help ensure that they have been manufactured and distributed under known conditions.

"We believe RFID is potentially the best way to track and trace [pharmaceuticals] from manufacturing to dispensing," says Paul Rudolf, M.D., J.D., senior adviser on medical and health policy for the FDA. "RFID should make the copying of medications either extremely difficult or unprofitable."

Although counterfeit drugs make up less than 1 percent of the U.S. market, estimates of counterfeit drugs such as antimalarials can range as high as 50 percent in underdeveloped countries, Rudolf notes.

The problem is on the upswing. Drug counterfeiters are using the Internet to distribute counterfeit prescription drugs globally, according to Rudolf. The number of open FDA investigations of pharmaceutical counterfeiting rose from about six in 2000 to about 22 in 2003, he says.

FDA has no immediate plans to mandate adoption of RFID and has avoided setting agency requirements that could stifle the technology's progress or increase costs, Rudolf explains. But the agency has been working closely with industry to help develop RFID pilot implementations to test and fine-tune the concept.

FDA that believes the widespread use of RFID technology will be feasible in the pharmaceutical supply chain by 2007, Rudolf says.

Transformational Technology

As the public and private sectors embrace the use of RFID technology, the market has nowhere to go but up. Global sales of RFID hardware and software, which surpassed $1 billion in 2003, will reach $6 billion annually by 2008, predict analysts at ABI Research, a market researcher in Oyster Bay, N.Y.

However, RFID technology faces some obstacles. Standards governing transmission of data between RFID tags and readers are still evolving. Also, the quality of RFID hardware and software can be spotty.

The transformational impact of RFID on the supply chain should begin to materialize by 2008, says Jackie Fenn, vice president and research fellow at Gartner, a research firm in Stamford, Conn., in her report, "Emerging Technologies: Transforming Industries and Business Functions."

"As the cost of RFID and other tagging technology falls dramatically over the next decade, smart networked objects will become prevalent," Fenn predicts. The technology, she adds, "will lead to new cost efficiencies in tagging even low-value items." FT

WHO'S GOT THE POWER?

All radio frequency identification systems include three elements: a transponder (the RFID tag), an antenna and an interrogator (the device that reads the data on the tag). The big difference between active RFID and passive RFID is power. Active RFID tags have their own power supply, while passive RFID tags do not.

PASSIVE RFID

- **Power:** The passive RFID tag draws its power from the reader, which sends out electromagnetic waves to induce a current in the tag's antenna.
- **Size:** Tags can be as small as a thumbnail.
- **Cost:** Each tag costs between 20 cents and 50 cents.

ACTIVE RFID

- **Power:** An active RFID tag has a built-in power source, a battery that continuously powers its microchip's circuitry and broadcasts a strong signal to the reader, using its built-in antenna.
- **Size:** Tag size varies, but generally about the size of a TV remote control device.
- **Cost:** Each tag costs between $70 and $100.