Lab dedicated to RFID technology

MADISON, Wisconsin (AP) -- Alfonso Gutierrez smiles as boxes of Kraft Macaroni and Cheese tagged with tiny chips zip around a conveyor belt and pass under a reader that instantly displays information about the product.

"It's going fast," said Gutierrez, who heads a new university research lab dedicated to helping businesses deploy the technology that could one day replace the bar code.

Gutierrez was referring to the speed of the conveyor belt -- 600 feet per minute, the speed Wal-Mart uses in its warehouses -- but he could have been talking about the rapid acceptance of radio frequency identification, a technology that can revolutionize business but also erode privacy.

RFID uses a computer chip the size of a grain of rice to store data, which are transmitted wirelessly by a tiny antenna to a receiver. The chips, embedded in tags, now track pallets in warehouses and let drivers pass toll booths without stopping, but its potential is almost limitless.

To accelerate deployment, the University of Wisconsin-Madison formally opened a lab this month to study how to make RFID work better, leaving to others to debate the broader issues such as implementation and privacy.

"RFID technology and applications are revolutionizing supply-chain management and are enabling companies to obtain an enormous amount of data in a short period of time," said Paul Peercy, dean of UW's College of Engineering. "It's only in its infancy state, but it's going to affect nearly all industries."

More than 40 companies, including 3M Co., Kraft Foods Inc. and S.C. Johnson & Son Inc., are contributing $500,000 combined to start the lab, and the university is kicking in another $62,000. Other companies can pay for individual research projects, giving them access to top-notch scientists without having to fund their own lab.

In 2003, Wal-Mart Stores Inc. and the Department of Defense ordered their top suppliers to start using RFID technology by this year. The goal was to track products without human interaction, resulting in fewer misplaced shipments and the ability to restock store shelves as soon as a product runs out.

Wal-Mart spokeswoman Christi Gallagher said the retailer is on track to have the technology at 13 distribution centers and up to 600 stores by October, but she said many suppliers have had difficulties finding tags that fit their products or figuring out how to place them in such a way that they can be read without outside interference.

About a dozen of Wal-Mart suppliers are among the chief funders of the Wisconsin lab, which will be dedicated to finding solutions for such challenges, including interference from metal products in warehouses and metal doors on loading docks.

The conveyor belt that Gutierrez oversaw allows companies to test different tags and determine which work best and where they should be placed.

The lab comprises of a few rooms spread out on three floors of an engineering building on campus. It has an echo-free chamber that allows researchers to test the strength of signals from different antennas. Two floors below, a portal-dock station simulates goods passing beneath a reader in a warehouse or at a loading dock.

Researchers are looking at ways to embed the chips in the packaging rather than simply adding them as labels to the outside, allowing companies to lower costs and position tags correctly.

The lab also is testing whether permits that hang on the rearview mirrors of cars can carry tags reliable enough to lift parking lot gates and whether tags on wristbands can track patients in hospitals.

Patrick Sweeney, chief executive of ODIN technologies and author of "RFID for Dummies," said the lab will serve as a trusted source for information at a time the technology is beset by technical problems and fears of privacy abuses.

The technology, around since World War II, got a boost through research at the Massachusetts Institute of Technology. The four-year effort, sponsored by Wal-Mart, Gillette Co. and other major corporations, ended in 2003.

Other universities, including the University of Florida and the University of Arkansas, also have RFID labs as do dozens of other corporations.

What makes UW-Madison's lab unique is its collaboration with industry and its focus on the physics and engineering behind the technology, said Sweeney, who has visited other RFID labs elsewhere.

Critics worry, however, that UW-Madison is contributing to technology that could ultimately track humans.

One such fear involves the use of tags in clothing and shoes. If the chips aren't deactivated at the time of sale, unsuspecting consumers might essentially be carrying around information about their buying habits, allowing stores to target them with intrusive marketing pitches the next time

they visit.

"When I see the move of RFID into universities, it concerns me," said Katherine Albrecht, a privacy advocate who specializes in RFID technology and shoppers. "It is sending a message that not only do we not have to worry about privacy but you can profit from it by a career perspective."

UW researchers acknowledge the potential for abuse, but insist their work is more about enabling mechanisms to ultimately make humans safer.

RFID could be programmed to detect bacteria and recall tainted food, prevent errors in blood transfusions and ensure that drugs are not counterfeit, they say.

Already, the tags help parents track children at amusement parks and help hospital personnel prevent unauthorized people from kidnapping newborns, said Raj Veeramani, director of a UW consortium of businesses involved in the lab.

And former Wisconsin Gov. Tommy Thompson, recently named to the board of a company that makes chips to implant into humans, says he may put one into his arm so that doctors can know his medical history. Federal regulators approved that use of the technology earlier this year, though few hospitals are equipped to read the chips.

"It's wrong to blame the technology. It's the people that develop applications for it," Veeramani said. "We are still trying to figure out what role RFID will play in the larger scheme of things."

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