

The Future of Tech

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Attention, Shoplifters

With \$30 billion in theft, there's a revolution in surveillance systems

There are 6 million video cameras mounted in stores across the U.S., according to market researcher J.P. Freeman Co. Their unblinking eyes are everywhere, watching exits and peering down aisles. You already knew that. But you probably had no idea how smart some of these cameras are getting.

Some Macy's (FD), CVS (CVS), and Babies 'R' Us stores have installed a system called the Video Investigator, whose advanced surveillance software can compare a shopper's movements between video images and recognize unusual activity. Remove 10 items from a shelf at once, for instance, or open a case that's normally kept closed and locked, and the system alerts guards sitting in a back room – or pacing the sales floor – with a chime or flashing screen. The system can predict where a shoplifter is likely to hide (at the ends of aisles, behind floor displays). A search function spots sudden movement that might indicate a large spill, prompting workers to clean up before it leads to a slip-and-fall accident and a costly lawsuit. And if someone opens a back door at 2 a.m., the system will record who sneaked in and link it with snapshots of the previous and next persons to use the door. Alerts, complete with images, can be sent to handheld devices, keeping retailers informed 24/7, says Jumbi Edulbehram, vice-president for strategic marketing at IntelliVid Corp., a Cambridge (Mass.) firm that makes the Video Investigator system.

Store managers these days need all the high-tech help they can get. Increasingly, they're under assault from organized gangs of professional shoplifters. These skilled thieves walk off with huge amounts of selected items and resell them at discounts. The pros are driving up losses dramatically, to \$855 per shoplifting incident last year, from \$265 in 2003, according to a survey by the University of Florida's Center for Studies in Criminology and Law. All told, stores lost \$30 billion to shoplifting and employee theft in 2005.

To fight back, store chains are embedding smarter devices everywhere, from checkout stands to shelves to places you wouldn't even think of (and can't see). At the same time, more of these systems are talking to each other, sharing data about shoppers and employees alike.

INVISIBLE DETECTIVES

Even the lowly shopping cart has been recruited in the war on retail crime. A surprisingly common – and simple – scam is the “push out,” in which thieves load up carts and just dash out of the store. The solution: Gatekeeper Systems Inc. (GKR), in Irvine, Calif., invented an electric-fence technology for carts. The system, called GS2, uses radio frequency identification (RFID) chips, which are embedded in cart wheels, and antennas around the periphery of the store that broadcast signals to the chips. When a cart approaches the store boundary, its wheels lock up. They can be unlocked only by an employee who activates a remote-control device. “[Thieves] can't push the cart,” says Brett Osterfeld, Gatekeeper's vice-president for sales and marketing. “They'd have to pick it up and walk with it.” Target Corp. (TGT) and several smaller chains have signed on.

Those handy rungs underneath the cart are great for hauling bulky items like diapers, pet food, and beer. The problem for retailers is that shoppers often “forget” to pay for the goods. The answer? Seven grocery chains, including Pathmark Stores (PTMK) and Giant Eagle, recently began testing LaneHawk, a system by Evolution Robotics Retail Inc. that uses visual pattern recognition to spot hidden packages. Cameras mounted in cashier stands about six inches off the ground scrutinize the bottom racks of passing carts. If an item matches an image in a database, the system computes the price of the product and adds it to the customer's bill. “It's like biometrics for packages,” says Alec Hudnut, CEO of Evolution Robotics Retail.

Many criminals aren't stupid, of course, so the name of the game for surveillance experts is making their wares all but invisible. Some of the most powerful sensor systems are being embedded right under your nose. Take those beige plastic discs that retailers snap onto clothes and accessories, called electronic article surveillance (EAS) tags. Now they're being made as small, and nearly as thin, as a toothpick. DVD manufacturers stick disposable versions on product packages before shipping to retailers. J. Crew Group Inc. (JCG) sews the devices right into clothing labels, telling shoppers to remove deactivated units before washing.

Soon stores may replace EAS tags altogether with RFID tags that offer a more precise and inconspicuous way of tracking items on a sales floor. The tags, which come in different shapes, many smaller than postage stamps, communicate with a handheld device, telling workers the exact location of a given item. Retail giants like Wal-Mart (WMT) and Target are big advocates of RFID technology, but for now use them mostly to monitor inventory.

Cost is one reason retailers are holding back: Tags run from 7 cents to 20 cents apiece, based on quantity; many are waiting for a 5 cents tag before investing in the technology. "The tags would have to be a lot cheaper... to put them on a bottle of water or pack of gum and add value rather than cost," explains Simon Langford, Wal-Mart's manager of RFID strategy.

Still, a few chains, including Best Buy Co. and (BBY) Tesco Corp. (TESO), are testing RFID's ability to monitor oft-stolen items like DVDs, jewelry, and apparel. Those chains have experimented with TrueVUE, a system by VUE Technology Inc. that uses antennas placed under a shelf's laminated surface to communicate with RFID tags on merchandise. Store employees could also wave RFID-reading wands over racks of clothes to see which items have moved. "The program wakes up the tags, which send back their serial numbers, in effect saying, 'I'm here,'" explains VUE CEO Robert Locke. EAS tags only activate when they approach a store exit, but RFID-equipped smart shelves can notify security the minute a large number of items move.

No part of a store churns out more data than cash registers. This is also where employee theft is most likely to pop up. New types of transaction-monitoring software pull information from registers into a central database and look for unusual patterns. An excess of manually entered credit-card numbers could be a sign that employees are stealing customers' information. Returns of the same type of sweater 10 times in a row at one register, for instance, could indicate that an employee is processing fake returns for a friend or being conned into making fraudulent returns. Retailers decide what to track and how often, and set parameters for alerts. Often the feedback points to problems other than dishonesty. "It might be a hardware issue or a sign that an employee needs more training," says Cheryl Blake, a vice-president at Aspect Loss Prevention, which works with Children's Place Retail Stores Inc. (PLCE) and Ross Stores Inc. (ROST) "Whatever it is, the transactions will stick out and tip off management to investigate."

Collecting tons of information only helps, though, if you're able to sift through it and figure out what it's telling you. Already, U.S. retailers record an estimated 1,000 years of video every day, according to IntelliVid. "Rather than have someone watch and review TV for hours on end, retailers are utilizing intelligence behind the video screen," says Joe LaRocca, vice-president for loss prevention at the National Retail Federation trade group. That's why stores also are investing in technologies that can communicate with each other. RFID systems, for instance, can cue up video cameras to check out an aisle where they have detected suspicious activity, catching suspects on tape before they get out of the store. "Retailers can pull data from all these systems, look at them together and connect the dots," says Rob Garf, a research director at AMR Research.

The newest retail data-mining programs also sync up with video to permit a more comprehensive look at activity at cash registers. With the press of a button, managers can highlight irregular register transactions on their computers and pull up corresponding video. This could enable them to catch cashiers who cut deals for their friends or pocket cash refunds themselves. It could also curtail fraudulent returns by tracking the route customers take to the customer service desk – do they head straight there or meander through the store, picking up their "return" merchandise along the way?

MUM'S THE WORD

Despite this revolution in retail tech, you won't find many stores bragging about their new security tools. No one wants to tip off shoplifters or advertise that they suspect their customers. That's why so much of the technology is hidden in the first place. But another reason stores don't talk much about surveillance is that they know it sparks concerns about privacy. Consumer groups and legislators have opposed the spread of RFID and video surveillance for just that reason.

"Item-level RFID creates privacy and security problems that are unacceptable, even for antitheft purposes," says Dr. Katherine Albrecht, founder and director of Consumers Against Supermarket Privacy Invasion and Numbering.

Retailers contend that such measures are justified because the cost of theft gets passed on to honest shoppers. Many also point out that these programs do double duty by collecting data on store traffic and out-of-stock items that can be used to fine-tune inventory and staffing. "The bottom line is, loss prevention technology improves the customer experience," says Ernie Deyle, vice-president for loss prevention at CVS.

If every retail chain is not yet sold on the benefits of relying so much on chips and software to patrol store aisles, experts still believe the industry will keep moving toward ever-smarter, ever-more-networked tracking systems. The number of video cameras installed in stores is expected to grow by 20% over the next year, according to J.P. Freeman. "It won't be long before retailers link their store data to crime reports and statistical analysis to predict losses... and deploy the right technology and people to stop them," says LaRocca of the National Retail Federation. Already, tech startups are working on even more promising – or intimidating – systems to track customers through the entire shopping process. There's even talk of stores installing facial recognition programs and license plate readers to catch repeat offenders. You're not likely to notice much of a difference at your favorite shopping haunts. But make no mistake – they're noticing you.