tyco Retail Solutions

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# Shrink Visibility

## The forensics of integrating item-level RFID and loss prevention

# Introduction

**Store Intelligence.**
**Retail Excellence.**

## // Executive Summary

Loss Prevention (LP) departments face two obstacles in their attempts to control retail "shrink." First, the definition of shrink itself is imprecise: often, it tracks financial losses at the category level instead of individual events at the SKU level. Also shrink lumps in losses from shoplifting, internal theft, and Organized Retail Crime with receiving miscounts and vendor errors outside LP's area of responsibility. Second, most LP analysis and response are backward-looking: useful for staffing and long-term mitigation, but less effective in organizing real-time response or quick adaptation to new tactics in retail theft.

The integration of item-level RFID information and Loss Prevention data creates a real-time understanding of what, when, and how specific items go missing. We call this new understanding Shrink Visibility, combining information from Electronic Article Surveillance (EAS), video surveillance, and new Radio-Frequency Identification (RFID) inventory-visibility technology to give a complete picture of loss events—at the SKU level and in full context—at the moment they occur. Shrink Visibility helps retailers:

// Track and manage retail shrinkage from all sources, in real time

// Differentiate between actual store shrink and other forms of inventory distortion

// Pinpoint shrink sources, in the store and all along the retail supply chain

// Replace after-the-fact follow-up with real-time response and predictive analytics

Shrink Visibility improves Loss Prevention effectiveness, and simultaneously corrects errors and gaps in Inventory Visibility. By integrating multiple store technologies and databases, Shrink Visibility delivers a more intelligible, accountable, and ultimately more profitable retail environment.

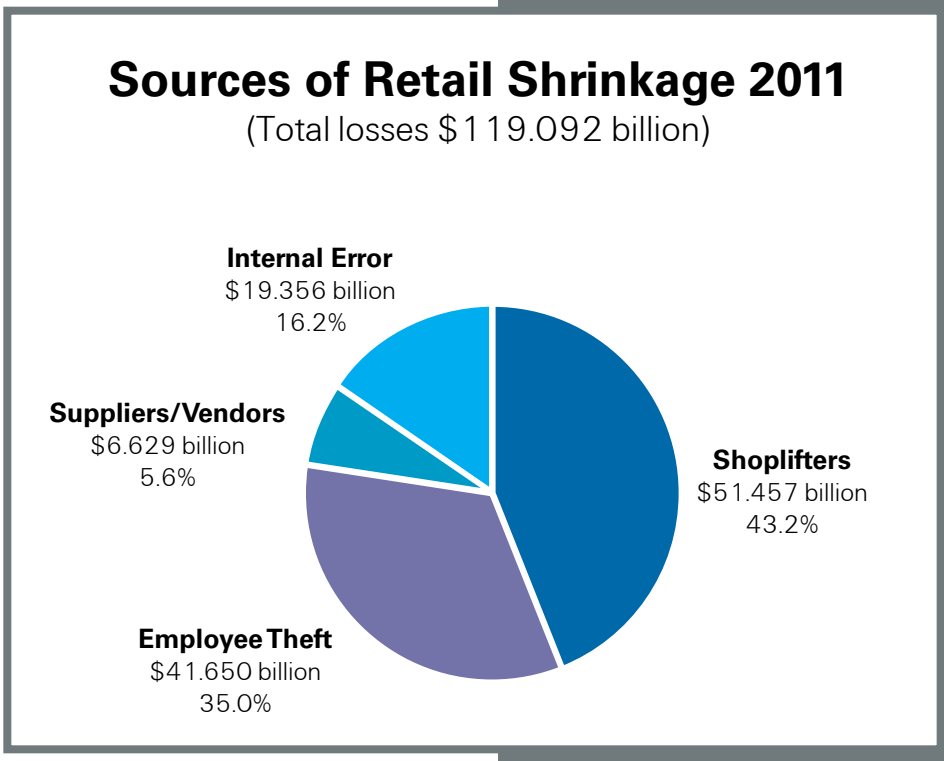
### Shrink

At a time when store margins are under intense competitive pressure, "shrink"—shortfalls in physical inventory compared to information contained in the system of record—can make or break a retailer's bottom line. But today's shrink numbers are vulnerable to blind spots and imprecise metrics that misrepresent inventory on-hand, distort incentives, misdirect remediation efforts, and hurt financial performance.

In principle, shrink calculations are simple. Inventory Management Systems (IMS) capture data about incoming goods using RFID, barcodes, or manual checklists. By subtracting sales recorded at Point-of-Sale (POS) terminals, adding returns and adjusting for other inventory transactions, the IMS would ideally track sales-floor and back-room inventory at the SKU level. But in the real world, SKU records often are incomplete and subject to distortion from a variety of sources, lumped together as "gross variance." To reconcile these errors on their books, retailers conduct periodic or rolling physical inventory counts to calculate net variance—a financial measure obtained

by subtracting the value of physical inventory (typically at the category, not the SKU level) from the value assigned to it in the IMS. The value of any shortfall is called "shrink."

But this definition of shrink is what accountants call a plug, or reserve number—it's calculated, not measured. Shrink doesn't really explain discrepancies between IMS data and physical inventories; it just provides a convenient accounting bucket to collect and reconcile losses that actually stem from multiple root causes. And like most plug numbers—"goodwill" on corporate balance sheets is another example—shrink numbers can be unreliable, with unpredictable variation across stores, seasons, and regions. This calculation of a single number for shrink also is misleading. In addition to shoplifting and employee theft, inventory discrepancies can occur from administrative errors like incorrectly tagged merchandise, product substitutions markups/markdowns and other retail price changes, or vendor fraud—all difficult to measure, frequently underestimated, and difficult to correct.[1] An in-depth University of Florida study revealed that shrink from such unknown




Source: 2011 Global Retail Theft Barometer

**Figure 1:** Best estimates of retail shrinkage are based on many assumptions and are calculated at category vs. at individual item level. These category-level shrink numbers combine and disguise recoverable losses from vendor fraud, supply-chain miscounts, and other sources, and obscure item-level detail that could help monitor, analyze, and prevent losses due to multiple root causes.

## Shrink by the Numbers: Impact on Retail Profitability

Shrink is cited consistently as a major operating challenge for retailers, as the impact is felt on many levels. Following is an example of the potential impact of shrink on profitability:

A retailer selling fashion accessories loses 20 handbags during a particular month, against sales of 300 units during the same month. Assuming the retailer's average sales price is US$30 with a profit margin of 25%, the associated shrink cost could be calculated as:

| (items lost) | x | (item cost) | x | (sales price) |
|---|---|---|---|---|
| 20 | | $0.75 | | $30 |

= (loss) $450

During the same period, profit on handbags sold would be:

| (items sold) | x | (item profit) | x | (sales price) |
|---|---|---|---|---|
| 300 | | $0.25 | | $30 |

= (profit) $2,250

Therefore, shrink costs the retailer $450/$2,250, or 20% of its profits on this merchandise – not counting profit on those handbags that might have been sold, or lost sales opportunities from stockouts.

## Impact to the Retailer

The retailer would have to sell 3 handbags (or .75/.25) for every item it loses to theft.

Retailers deploying RFID for inventory visibility are realizing the added benefits to shrink management. RFID-enabled shrink visibility offers new insights around how, when and where merchandise goes missing. And, understanding losses at the SKU level can help retailers identify high risk locations and times, enabling loss prevention resources to be adapted accurately.

sources often is misattributed to shoplifting or internal theft. Physical inventories can track it to the department level, but can't identify its source.

And shrink—whatever its source—is expensive. When shrink numbers conceal losses from vendor errors and substitutions, they block legitimate efforts at recourse. Markdowns of "phantom" inventory that is never available for sale underestimate actual losses, which may be many times the value of discounted paper losses. And when "real" physical shrink takes merchandise off the sales floor without triggering replenishment,[2] it can create "frozen out-of-stock" conditions that cost a store all the inventory turns on an item until a physical count corrects the error and triggers replenishment. At a time when organized criminal gangs raid specific categories and sizes,[3] out-of-stock conditions are most likely with popular items—exactly the ones that will cause the most financial damage.

## Loss Prevention

Minimizing shrink is the primary responsibility of Loss Prevention, and the discipline has developed robust processes and technologies to deter or detect fraud and theft, often backed by enforcement and recovery. Loss Prevention uses information from sales-floor surveillance, POS exceptions, theft deterrent devices, and EAS alarms at entrances, backed by exception-based reporting and analytics—valuable but backward-facing approaches. They give retailers limited ability to anticipate or respond in real time to organized criminal campaigns or merchandise processing errors, untangle complex thefts like POS "sweethearting," or identify long-term trends in merchandise targeted by thieves.

Distorted IMS inventory records offer little help. Physical counts are badly out of date by the time they're compiled, and can't ever be used to guide real-time adaptive alarming or staff deployment. And shrink metrics that fold in receiving shortages and other inventory distortions obscure rather than highlight trends like the rise in organized retail crime.

Lacking details of what is missing where, and at what times, Loss Prevention departments fall back on historical trends to make key decisions regarding high-risk merchandise categories, stores, days and times, or security-camera views of the sales floor. Also they lack information about the direct impact of their enforcement and remediation efforts. Operating without real-time data and item-level analytics, Loss Prevention teams do the best they can with their tools and budgets, but don't necessarily concentrate on after-the-fact forensic measures, which can spread their limited resources thin.

## Shrink Visibility: Integrating Information Sources

Adding item-by-item RFID reads at key points in the store is a step toward "Shrink Visibility"—a comprehensive view of store-wide shrink achieved by integrating information across multiple store systems. Shrink Visibility is an alternative to the blind spots and shortsightedness created by current tools for assessing and reducing shrink. Capturing quality data in real time enables predictive, analytics-based strategy and response—at the exit, in receiving, and on the selling floor. Adding video analytics helps verify exceptions, and provides important detail surrounding each event.

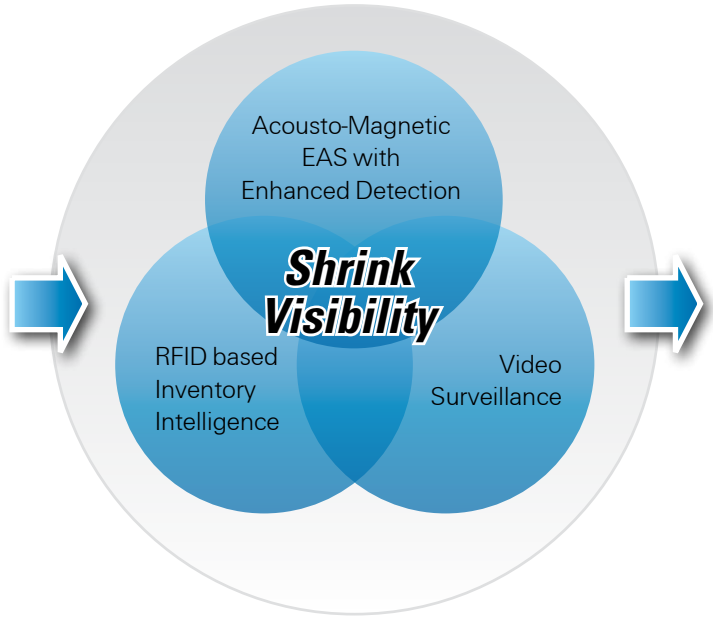
Full integration pulls together information from all technologies deployed within a store. RFID, EAS, and video LP technologies may include innovations like multi-technology read points, specialty hard tags, video, and smart surfaces that deactivate and detach tags based on

## Shrink Visibility Vision

Redefining Security with Information-Based Loss Prevention

***Separate Solutions***

- **RFID Inventory Visibility** often focuses on the selling floor, resulting in blind spots at exit
- **Acousto-Magnetic EAS** provides robust protection at the exit, but lacks visibility into item-level data
- **Video Surveillance** needs exception events to provide actionable data




***Leveraged Solutions***

- Adaptive deployment of LP personnel
- Theft trend analysis by store/region/country/time/day
- Selective alerts for key loss categories
- Fewer nuisance alarms; better LP staff responsiveness
- Indexed video details items, times and locations

Bringing Together EAS, Inventory Visibility and Video

activity at the POS terminal. Integration extends the store's Inventory Management System, and includes SKU-level data from product receiving, point-of-sale terminals and returns databases. And it adds data from store security and business intelligence solutions to keep item-level information in full context of other events. Shrink Visibility is store-wide, item-level visibility of merchandise, including all the different ways inventory can escape the system—information that stores once lumped together in a single number.

Consider how Shrink Visibility could help a big-box electronics store address the systematic theft—with possible insider assistance—of high-value consumer electronics. Using item-level RFID information to augment alerts from its EAS-based LP system, the retailer can set its Loss Prevention platform to alert staff whenever the number of tablet computers leaving the store crosses an hourly threshold. By setting alarms to trigger video captures of POS scans and store exits, the store can know when, where, how often, and in whose hands every item is leaving, so the LP team can dig into root causes of losses instead of chasing after symptoms—and even use images of thefts in progress for use as evidence at trial.

Detailed context information, integrated with store systems, attacks persistent problems in Inventory Management and Loss Prevention described above, and advances Loss Prevention capabilities beyond their current limits.

### At receiving

Automated processes up and down retail supply chains are accelerating purchasing cycles, reducing receiving delays and costs, and helping to distinguish in-store from supply-chain shrink. Small process adjustments—integrating SKU-level information into Advanced Shipping Notices, for example—can automate accuracy checks on receipts and accelerate

**Figure 2:** A 360° view of shrink integrates information from Enhanced Electronic Article Surveillance, RFID Inventory Visibility, in-context Video Surveillance / Verification, and Point-of-Sale data.

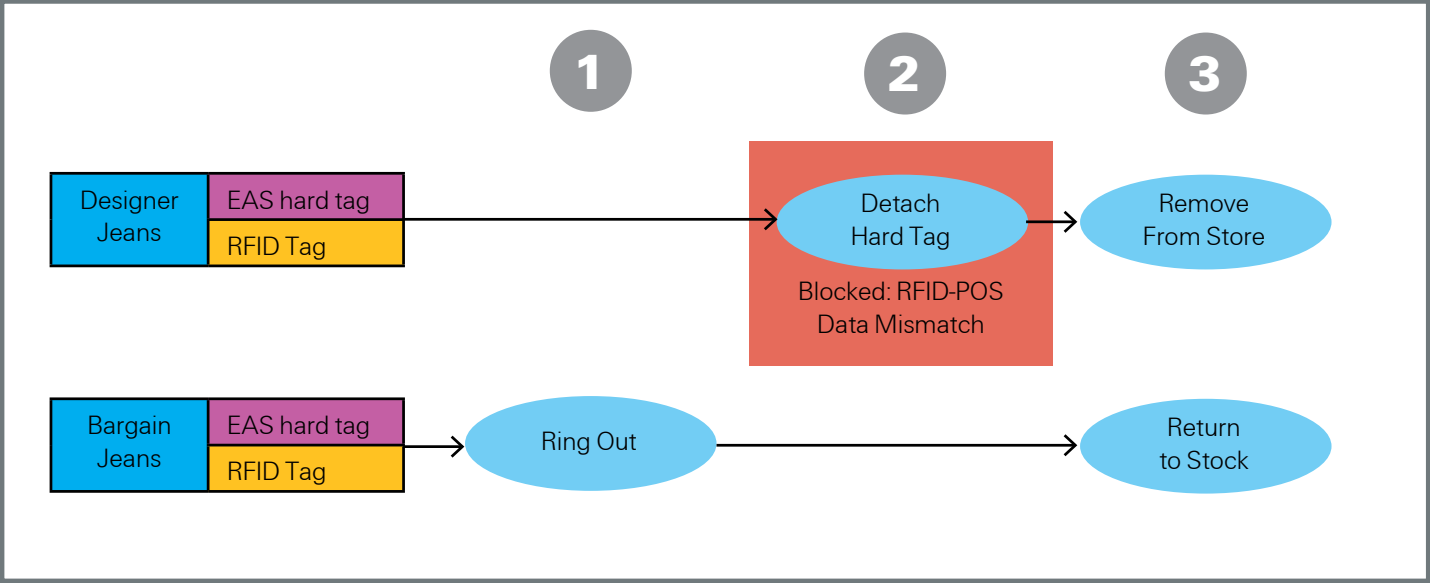



**Figure 3:** Shrink Visibility stops POS "sweethearting." Hard-tag detachment requires a completed transaction for the same item, so dishonest store employees can't collude with thieves by ringing out inexpensive items while detaching and bagging expensive ones.

vendor recourse for any discrepancies. More sweeping changes such as vendor-managed inventory agreements offer even greater savings, but require very high-quality information about the source and scale of any loss.

Shrink Visibility is essential to the integrity of receiving information. With RFID technology, retailers can check in merchandise with 100% verification of contents. Cartons intended for other stores can be flagged for immediate re-routing. Product substitutions or errors can be identified without pulling associates off the sales floor for SKU by SKU counts. And identifying losses due to administrative error, fraud, or theft improves accuracy and recourse for all supply chain participants, including suppliers and carriers.

## On the selling floor

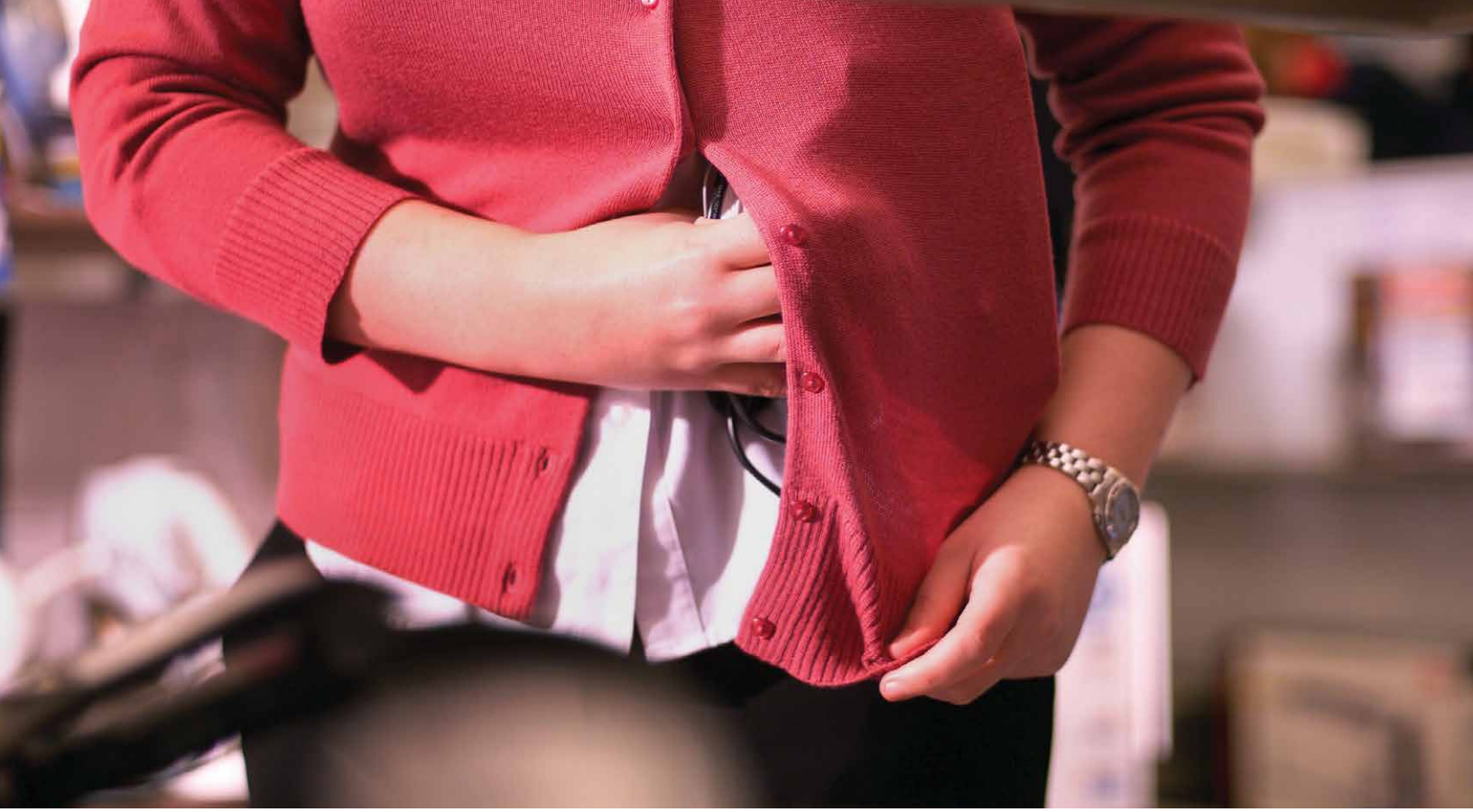
Addressing shrink on the sales floor—especially in high-risk areas with limited staff visibility—is a persistent challenge for Loss Prevention. Thieves use quiet corners of stores, areas with tall shelves, and fitting rooms to remove EAS tags and labels, conceal items, and stage merchandise for later theft. Staff video surveillance and public-view monitors improve visibility and deterrence, but can't offer SKU-level information about item movement that LP staff need to anticipate and intercept a theft or staging event.

RFID-enabled item-level tracking in critical zones—high-margin "boutiques," consumer electronics and media, and secluded areas like fitting rooms—gives Loss Prevention a powerful tool to analyze the process by which retail gangs stage merchandise within the store for later concealment and removal. For example, movement of ten identical SKUs of high-end jeans from a designer's boutique to a fitting room or the sporting goods department is a tip-off to the LP team that an Organized Retail Crime event may be in progress.

## At checkout

Many forms of retail fraud depend on collaboration between an "outside" thief and an employee staffing a POS terminal; it's one reason front-of-store video surveillance often covers checkout stations as well as store exits. But video alone can't detect paperwork-based crimes. In "sweethearting," for example, a thief presents both an expensive and an inexpensive item from a single category like jeans, asking the sales associate to ring out the cheap pair and return the expensive pair to the shelves. The POS collaborator detaches the EAS tag and bags the expensive pair, but scans the cheap pair and shelves it for restocking.

Detection of sweethearting and related crimes requires integration of information across item-level tracking, POS, and possibly video systems. Comparison of item-level and POS data can detect the crime; real-time solutions that allow hard-tag detachment only after items have been scanned can prevent it; and video-capture integration can identify the outside thief as well as the corrupt or compromised employee.



## At the exit

Adding RFID capability to EAS exit pedestals produces dramatic improvements in Loss Prevention. RFID tags can detect individual items leaving the store without proper transactions, and trigger video captures to deter future losses and collect evidence against suspected thieves.

Improvements in inventory visibility are equally dramatic. Item-level data from merchandise leaving the store, correlated with tag or barcode reads from POS terminals in the immediately preceding time period, reliably measures total decrement from inventory-on-hand. Basing replenishment on total lift instead of sales keeps planned levels of inventory on the floor and avoids out-of-stock conditions due to undetected shrink. Exit reads uncorrelated with preceding POS reads reflect actual shrink—errors and theft. And because this is an actual measurement rather than a plug number, the information isn't obscured by other kinds of inventory distortion.

And data from RFID tags on returned goods can be checked against POS data, reducing opportunities for merchandise substitution and other forms of return fraud. Shrink Visibility at the store exit gives LP departments the information they need to protect profitability on multiple fronts, instead of just following up shoplifting events.

But in addition to improving the effectiveness of current LP operations, a core contribution of RFID exit data for Loss Prevention is the opportunity to take Loss Prevention to an entirely new level, by applying predictive analytics to time, location, and exit data from every exit read, for benefits like these:

// Adaptive deployment of Loss Prevention personnel to the departments at greatest risk at specific times of the day, week, or season, for improved effectiveness without the costs of blanket coverage.

## RFID and Store-Level Inventory Visibility

Retailers—especially in Apparel—are implementing RFID technology to achieve inventory visibility, with accurate counts and precise location of high-value seasonal merchandise. Pointing out the added value of Shrink Visibility creates an opportunity for LP departments to influence the discussion about RFID adoption, and deliver additional benefits from the technology.

Continuous store-level replenishment and quick correction of out-of-stock conditions improve sales and shopper satisfaction. And extending item-level inventory visibility across multiple store "zones," such as back rooms, fitting rooms, and the selling floor, gives retail inventory managers the kind of up-to-the-minute operational awareness previously available only to online retailers.

A North American based retailer of branded apparel basics sold internationally has applied these concepts to achieve replenishment within an average 10 minutes after each sale—keeping popular merchandise on the selling floor, adjusting stocking and reorder processes to reflect color, style, and other item-level trends within a category, and more. The resulting improvements in sales, margin, and operational efficiency are in addition to an overall 25% reduction in shrink—a transformative event for this retail innovator.

// Trend analysis by store, region, or country, time/day/season and more, to compare theft patterns and identify long-term trends for key items.

// Selective alarming based on price, category, or item to focus on key loss categories, cut false alarms, improve LP staff effectiveness, and improve recovery.

// Indexed video surveillance of individual loss events, adding video context to item, time, and location data for forensic analysis, training, and compelling evidence.

Shrink Visibility fills in today's Loss Prevention and Inventory Visibility blind spots, sharpens their focus, and improves their cost-effectiveness. Integrated EAS, RFID, POS, and video data consolidate time/place/item information with item-level sales data, providing plenty of information to improve Inventory Management and Loss Prevention processes in established and entirely new ways.

### New retail insights

Retail stores can start their move toward Shrink Visibility today, to achieve rapid improvements in the ways they protect merchandise and manage inventories. By combining proven technologies, retailers can gain important visibility into theft events by opportunistic shoplifters or organized crime teams, restock or reorder stolen items to prevent out-of-stock conditions, and identify offenders using information shared across stores, within their own organization or with consulting, retail, or law enforcement partners. They can mine the data to identify trends, and change their loss prevention processes to prevent or mitigate future incidents.

Shifting Loss Prevention efforts from a reactive to a real-time predictive, information-based approach multiplies their effectiveness, driving new benefits that would not be possible otherwise.

A variety of technologies are available right now to help retailers address these operational and business challenges:

// Point-of-Sale analytics help track sales processes and productivity

// Video Surveillance to maintain safety and security, and provide context and evidence for shrink events

// Electronic Article Surveillance to deter and detect shoplifting, and

// RFID-based inventory visibility solutions to enhance the speed and accuracy of store operations.

Each solution is valuable in its own right—but together they deliver a new level of business intelligence. For the first time, retailers can understand not only what they sold, but also when and under what circumstances it was purchased. And, with shrink visibility, retailers can make the most of their technologies to understand exactly what was stolen, when it was taken, and even who was involved. Information can be reconciled without resorting to "plug numbers" and other shortcuts, and confident actions taken to improve operations, maximize sales opportunities, and improve profitability.

Footnotes:

1 Richard C. Hollinger, Ph.D. and Amanda Adams, M.A., 2009 National Retail Security Survey Final Report. (Gainesville, FL: University of Florida, 2010). www.crim.ufl.edu/research/srp/srp.html.

2 Rebecca S. Miles, Yana Mitchell, and Bill C. Hardgrave. Item-Level RFID for Apparel/Footwear: The JC Penney RFID Initiative. (Fayetteville, AR: Information Technology Research Institute, Sam M. Walton College of Business, University of Arkansas, 2010). http://itrc.uark.edu.

3 Tyco Retail Solutions Organized Retail Crime White paper, Titled "Building your defences against organized retail crime "

# // Notes

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