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VIEWPOINT

SMARTER STORES, SMALLER SHRINK: HOW AI CAN REWRITE RETAIL LOSS PREVENTION

Retailers can reduce shrink by shifting from reactive intervention to integrated, AI-driven, real-time intelligence across the retail value chain – enabling a preventative approach.

Infosys® | Knowledge Institute

Retailers and CPG companies lose billions of dollars every year to a persistent and costly challenge: shrink. This loss, stemming from a mix of theft, administrative errors, and supply chain inefficiencies, continue to erode margins and disrupt operations. According to the National Retail Federation, US retailers have reported an average inventory shrinkage rate of 1.6% of total sales in recent years, translating to over $100 billion in annual losses across the industry.

The financial impact is only part of it: Shrink also causes stockouts, operational bottlenecks, and poor customer experiences that can damage brand loyalty. In a very competitive market, where every percentage point of margin matters, unchecked shrink is more than a financial nuisance. It is a systemic issue that touches every part of the retail value chain, from store shelves to supplier docks. Turning to advanced data and artificial intelligence (AI) driven technologies can give retailers new tools to detect, prevent, and even predict shrink.

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Why shrink persists

Traditional methods of detecting and managing shrink are no longer sufficient for today's dynamic retail environment. Historically, retailers have relied on manual audits, CCTV footage, and periodic in-store surveillance to identify discrepancies. While these tools served a purpose in simpler retail ecosystems, they fall short in modern omnichannel retail, in which inventory moves fluidly across stores, warehouses, and fulfillment centers.

As retailers expand digital channels, offer same-day delivery, and enable click-and-collect services, the complexity of tracking products in real time multiplies. Each handoff in the supply chain becomes a potential blind spot. Manual processes struggle to detect anomalies quickly, especially when shrink originates from subtle sources like administrative errors, misplaced items, or vendor discrepancies.

The result is fragmented visibility: data exists but it's disconnected, making it difficult for retailers to pinpoint where, when, and why losses occur. Moreover, human intervention is reactive rather than predictive; investigations often happen after the loss has already occurred. This lag not only increases the financial cost of shrink but also erodes trust between departments, with store operations, finance, and supply chain teams often operating in silos.

To stay competitive, retailers need more than surveillance. They need intelligent, connected systems capable of detecting risks proactively, identifying root causes across the network, and providing insights in real time.

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The road to recovery

The solution lies in embracing advanced data- and AI-driven technologies that enhance visibility, accuracy, and decision-making across the retail ecosystem. Retailers need systems that not only record events but interpret them, detect anomalies, and predict potential losses before they happen.

AI-powered surveillance can go far beyond passive monitoring. With computer vision and machine learning, cameras can recognize suspicious behaviors, detect misplaced products, or flag unusual checkout patterns in real time. Similarly, radio-frequency identification (RFID) tagging and real-time inventory tracking can eliminate manual errors by providing end-to-end traceability, ensuring every item's movement is accurately recorded.

But technology alone isn't enough. The key is integration, which includes connecting data from stores, warehouses, suppliers, and even customer transactions into a unified intelligence layer. This allows businesses to correlate patterns across systems, automate responses, and make loss prevention a continuous, insight-led process rather than an occasional audit exercise. By combining automation, analytics, and real-time intelligence, retailers can transition from reactive loss control to proactive shrink prevention.

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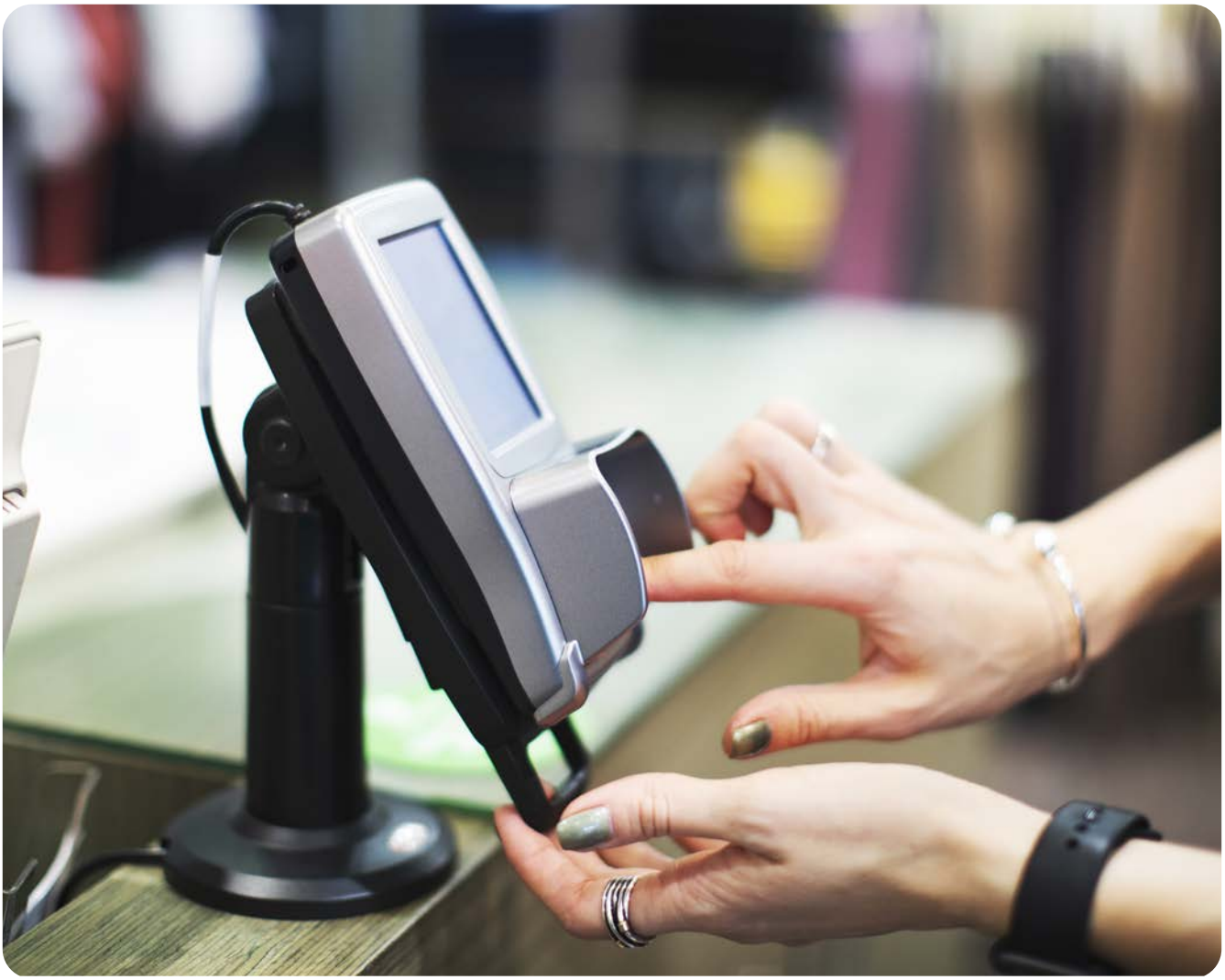
A smarter approach to shrink reduction

To reduce shrink, retailers and consumer packaged goods (CPG) companies must take a holistic, technology-enabled approach that spans people, processes, and platforms. Here's how they can get there:

- **Adopt AI-powered surveillance and smart shelf sensors**: Modern loss prevention begins with intelligence at the edge. AI-driven video analytics can detect theft, misplaced items, or suspicious patterns instantly. Smart shelves equipped with sensors can identify when products are removed or tampered with, enabling immediate alerts to store staff. These systems deter theft and improve operational oversight without adding manual workload. This trend is fueling the growth of video surveillance as a service (VSaaS). Walgreens is turning to AI to address retail crime. By analyzing live security footage, these intelligent systems can identify suspicious behavior and alert store teams instantly.

  Retailers are increasingly joining forces, even with direct competitors. AI-enabled mapping platforms now aggregate data from law enforcement and



participating retailers to generate heat maps of vulnerable areas and predict likely incidents. Stores can access these shared insights to strengthen preparedness and prevention efforts.

Traditional checkout and self-checkout lanes often contribute to administrative shrink through mis-scans, cashier errors, or intentional overrides. Studies indicate that nearly a quarter of the losses at self-checkout stations occur when shoppers accidentally mis-scan items.

To address this, retailers such as Amazon Go and Downtown Spirits are using Just Walk Out technology, which uses cameras, weight sensors, and AI to automatically charge customers from their digital wallet for the items they take, eliminating human errors in the checkout process. If an item is removed from the shelf but not recorded in any customer's virtual cart, the system immediately flags it as a potential inventory discrepancy or theft, allowing retailers to act quickly and reduce shrink.

- **Implement RFID and real-time inventory tracking**: RFID enables granular visibility across the product life cycle, from supplier dispatch to store checkout. By automating inventory reconciliation, it significantly reduces administrative errors and ensures accuracy in replenishment, leading to fewer stockouts and less waste. Retail giants such as Walmart, Lowe's, and CVS are partnering with technology firms to deploy advanced security solutions, including RFID tags and autonomous security robots, driven by AI. By deploying RFID, fashion brand Uniqlo gains real-time visibility into its inventory, including precise item counts, locations, and sales data. This enables faster resolution of discrepancies and reduces the risk of lost sales or excess stock.

- **Strengthen vendor compliance systems**: Shrink doesn't only happen in stores. Vendor-related discrepancies, including short shipments or mislabeling, can cause substantial hidden losses. Implementing digital vendor compliance systems can verify deliveries, authenticate documentation, and flag irregularities before they affect stock accuracy.

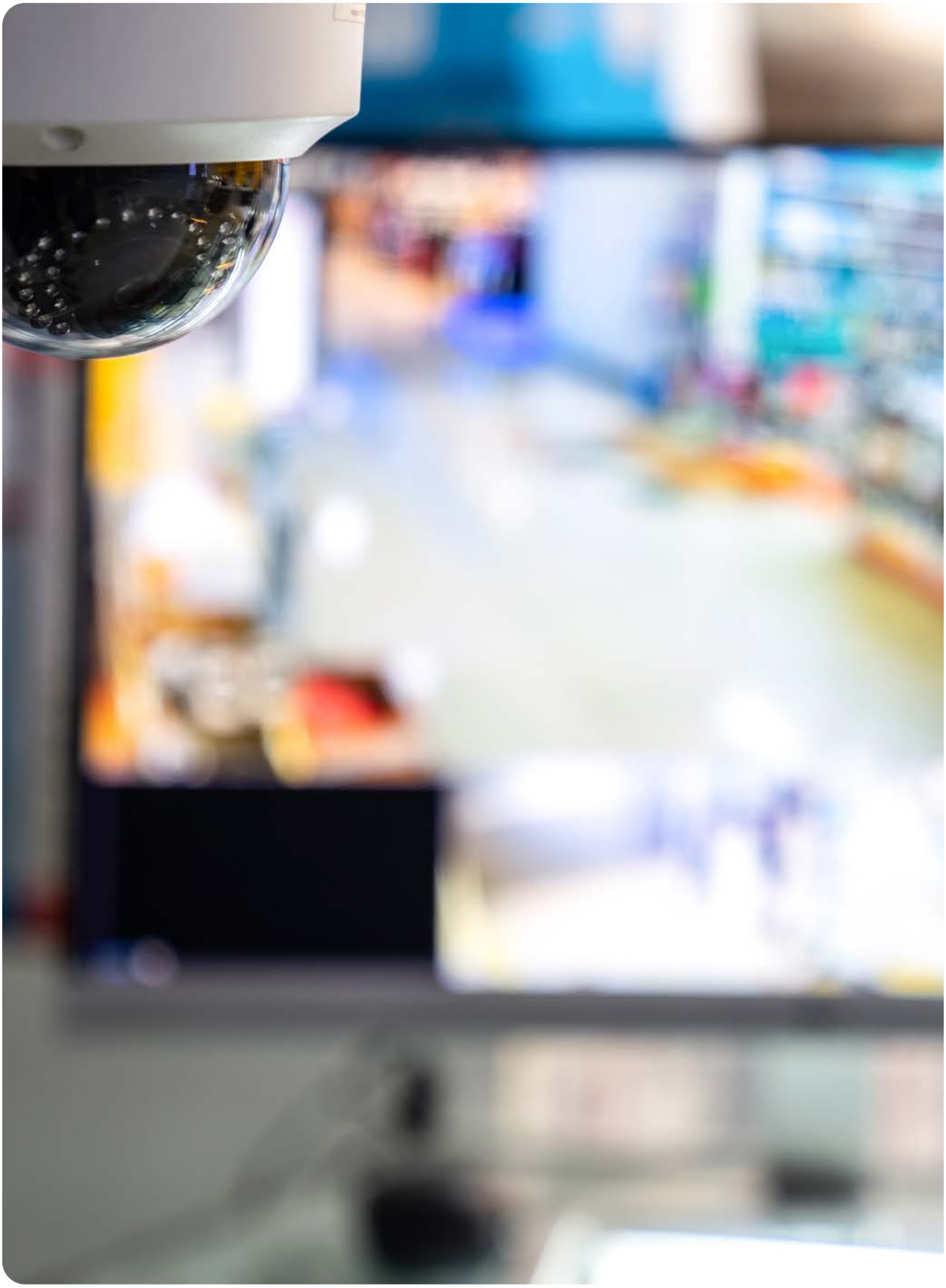
- **Invest in employee training and anonymous reporting tools**: A large share of shrink still originates internally. Training staff to identify early warning signs and equipping them with anonymous reporting mechanisms helps build a culture of accountability. When combined with data analytics, these programs can detect internal theft patterns and reinforce integrity. Retailers can also benefit from implementing scorecards and incentive programs that reward employees and stores for improving their shrink performance.

- **Leverage predictive modeling and automated reconciliation**: AI-driven predictive models can analyze transaction histories, operational data, and external factors to anticipate potential shrink hotspots. Automated reconciliation tools, meanwhile, can match sales and inventory data in real time, surfacing inconsistencies instantly for investigation. In one region, a global sportswear brand identified that 23% of cash refunds were issued without original receipts. Infosys implemented an AI-driven analytics solution to track key performance indicators (KPIs) and store-level trends. The company was able to detect potential revenue losses within a month and act swiftly to curb shrink.

Beyond technology, cross-functional collaboration is critical. Shrink control must become a shared responsibility among store operations, supply chain, and data teams. Collaborative dashboards and shared KPIs can help align efforts toward common goals.

Finally, retailers should adopt a data-centric, loss-prevention strategy that combines human expertise with AI. The future of shrink reduction lies not in isolated systems but in integrated intelligence where every byte of data contributes to greater transparency, faster decision-making, and a more resilient retail ecosystem.

By embedding shrink prevention into the fabric of operations, retailers can protect profits, enhance customer trust, and create a foundation for sustainable growth.



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