SOLUTION BRIEF

RFID Guide for Retailers' Omnichannel Fulfillment Success

How RFID Optimizes E-Commerce Operations Across the Supply Chain

The retail landscape is shifting to a hybrid of e-commerce channels and legacy brick-and-mortar stores. This hybrid approach allows customers to shop in a way that best suits their needs and preferences. However, omnichannel environments also create difficulties and challenges for retailers.

Omnichannel Retail Challenges

Retailers want to ensure a consistent customer experience whether they are purchasing in-store or online. Still, implementing omnichannel services such as BOPIS (Buy Online and Pickup in Store) and curbside pickup add complexity to supply chain operations. For example, businesses must know the status of their inventory and the locations of specific items. There are also logistics challenges when tracking multiple inventory locations, as inventory can reside at multiple nodes within a fulfillment network: stores, distribution centers, a contract distributor, a 3PL, or even on a truck en route.

Another challenge is that online shopping returns cost brands and retailers about 66% of the original item's price.[1] The Openpay report shows that U.K. retailers face an annual cost of £5.2 billion[2] due to online returns. Despite the item's condition upon return, the process still incurs significant expenses such as labor, reverse logistics, and inspection costs. As a result, more retailers are turning their retail stores into fulfillment hubs for pickup, shipping, and return processing to combat the challenge.

Retailers are also interested in reducing out-of-stock inventory and shrinkage and boosting efficiency. Table 1 shows recent statistics on hidden costs in the retail environment. Retailers need to adopt better solutions to solve these problems.

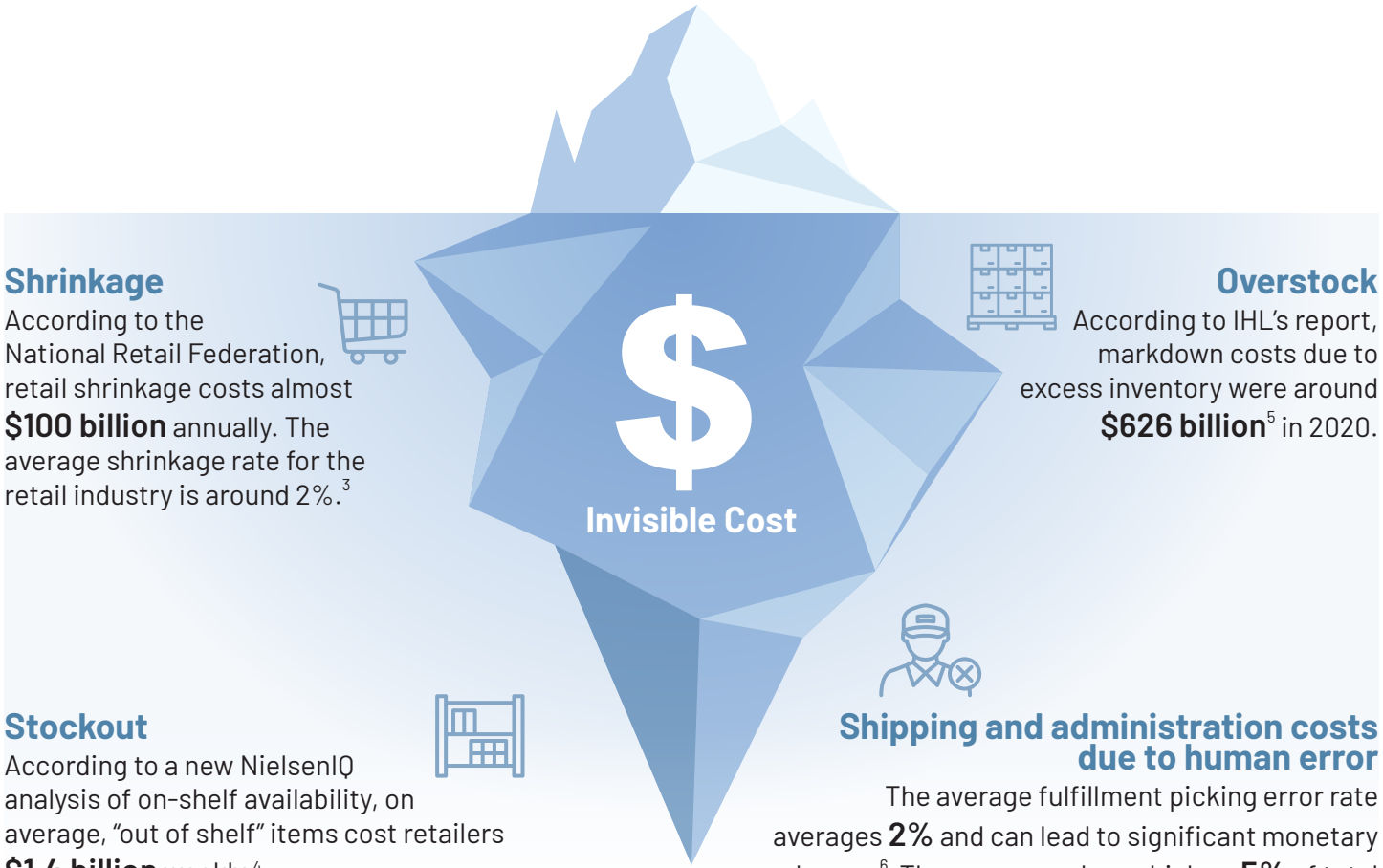


Figure 1: Hidden Costs in the Retail Industry

RFID Facilitates Omnichannel Retail Operations

To combat these challenges, the retail sector is adopting RFID to count inventory and track products moving from the warehouse to the store. Item-level RFID tagging contributes directly to the bottom line by reducing costs and increasing sales.

Here are some of the top benefits of adopting RFID:

Automatic and accurate inventory updates: RFID technology boasts 25 times[8] faster counting than barcode scanning, improving inventory accuracy by over 95%.[9] This technology is particularly beneficial for omnichannel retailers since it provides a real-time, 360-degree view of product inventory across multiple fulfillment network nodes, reducing the risk of stockouts and overstock.

Better visibility into the supply chain: RFID chips can be placed on products creating more accurate tracking and better inventory visibility from start to finish. Thanks to the RAIN Alliance, GS1 and ISO are working together to promote standards-based numbering systems (what users encode to their tags). This enables the value of RFID to be maximized across the supply chain for all trading partners.

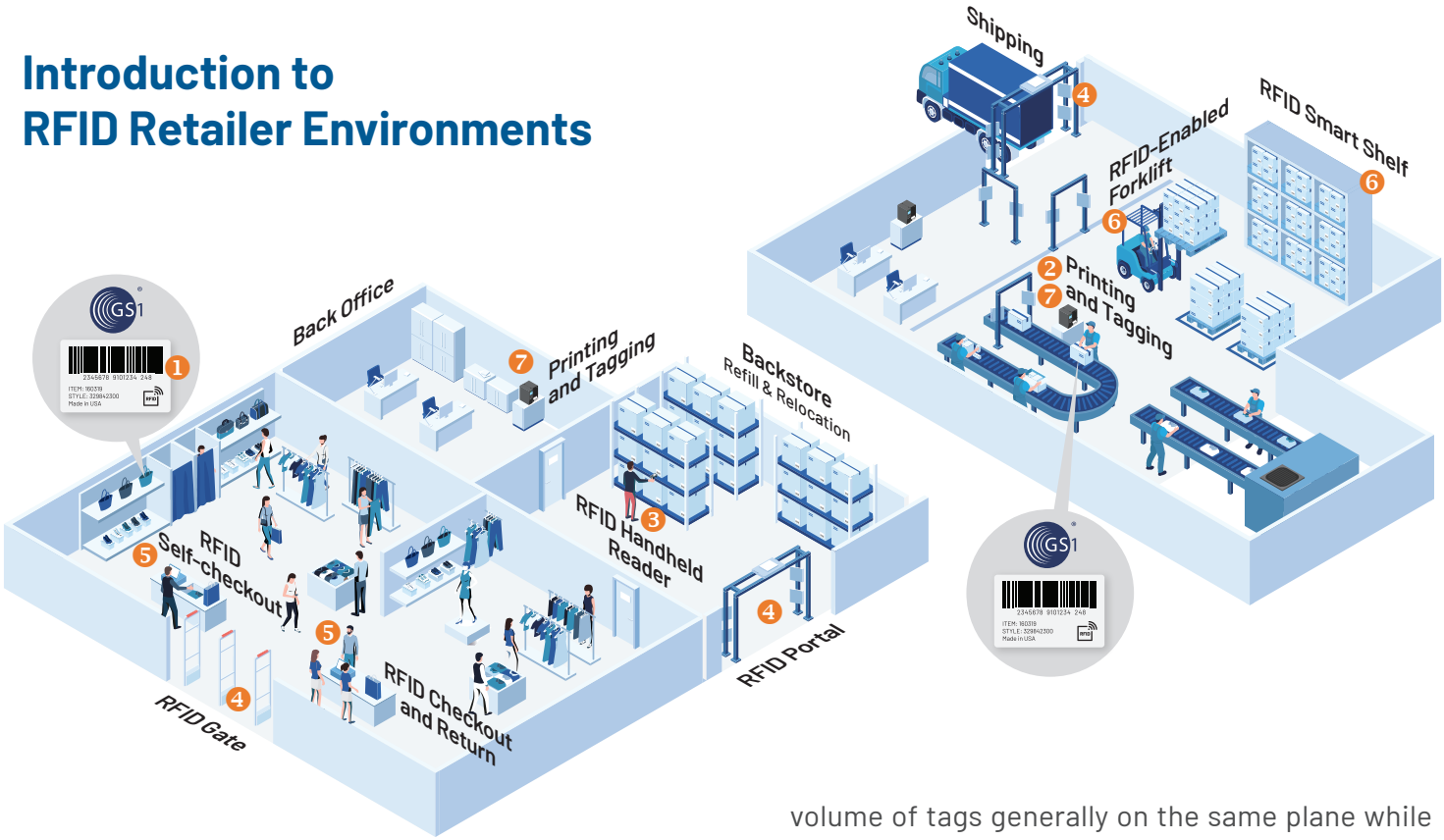
Improved loss prevention: RFID technology empowers retailers with comprehensive item-level data, allowing them to accurately pinpoint when items are lost or stolen. This technology is beneficial in high-theft areas, where RFID tagging can help prevent shrinkage. In addition, RFID tagging can counteract sweet-hearting, internal theft, and return fraud by keeping track of items at the point of sale.

Frictionless in-store checkout: RFID solutions that enable quick checkout of multiple items are moving beyond proof of concept and pilot stages to real-world implementation. Retailers can greatly reduce wait time to improve customer satisfaction and reduce in-store labor costs.

Reduce human error and effort: For omnichannel retail, whether retailers choose to fulfill orders from the warehouse or in-store inventory, confirming order accuracy is required. RFID-tagged merchandise facilitates inspection speed, and the same benefit applies to reverse logistics during return processing. On average, RFID improves labor productivity associated with order accuracy by 96%.[10]

Figure 2: RFID provides a real-time, 360-degree view of product inventory across multiple fulfillment network nodes, reducing the risk of stockouts and overstock

Introduction to RFID Retailer Environments



Depending on the application, the installation size, the type of system, and many other factors, it's recommended to partner with a qualified and experienced RFID systems integrator. Before starting an RFID project, we recommend the following:

❶ Select an encoding standard. Generating an EPC number based on GS1 standards is ideal for retail applications. Download our reference guide, "The Growing Importance of Adopting Global RFID Encoding Standards."

❷ It's best to apply RFID tags to items as close to the manufacturing source as possible, called "source tagging." Manufacturers can either get encoded tags from a service bureau or print-on-demand. Retailers should provide suppliers with clear label design and encoding specifications based on standards.

❸ RFID handheld readers are a convenient tool to read and count inventory. Such devices can immediately transmit and sync data to your ERP and order processing systems to optimize inventory. In addition to read range, speed, and read/write capability, you also need to consider different readers' signal patterns. For example, you might need to read a high volume of tags generally on the same plane while moving through your read field, or you might need to read multiple types of tags at different orientations with high accuracy.

❹ RFID gates and portals can help prevent theft and increase operational efficiency. RFID gates and portals can automatically track, trace, and record ship-in and ship-out items and automatically update the data to the inventory system or ERP.

❺ You can consider an in-store RFID checkout system to help ease prevalent labor shortages, increase staff productivity, and reduce customer wait times.

❻ For warehouses, you can adopt RFID-enabled devices such as forklifts or RFID smart shelves to identify locations automatically.

❼ Finally, even though your suppliers may source tag their own items, you still need to be able to print- on-demand, on-site (in stores and warehouses) for so-called "exception tagging" when an item is missing a tag. A full range of RFID-enabled printers is available to support exception tagging applications, regardless of print volume, label construction, and mobility requirements. Exception tagging is usually addressed with a smaller Desktop or Mobile RFID Printer, but Industrial models can also be used.

A Printer Brand You Can Count On

TSC Printronix Auto ID works closely with multiple standards organizations, such as GS1, ISO/IEC, AIM, and the RAIN Alliance, to ensure that our RFID printers correctly and adequately support various encoding standards. These standards are evolving rapidly, so it is essential to select a printer partner that is committed to supporting RFID standards as they evolve.

All models in our RFID printer portfolio support easy and quick switching between different label constructions. We offer various printer features and characteristics for your suppliers with varying requirements. Regarding exception tagging, we recommend the lower-to-high volume (and more) portable Alpha-40L, desktop T800 series, industrial T4000 series, and the T6000e RFID printers.

Model		T6000e RFID 4"	T6000e RFID 6"	T4000 RFID	T800 RFID	Alpha-40L RFID
Type		Industrial	Industrial	Industrial	Desktop	Mobile
Duty Cycle		10,000 labels/day		5,000 labels/day	2,500 labels/day	1,000 labels/day
RFID System	Encoding	RAIN / UHF				
	Standard	GS1 EPC Gen2 / ISO 18000-63				
	Antenna	Internal adjustable & external fixed	External fixed		Internal adjustable	External fixed
	Printer Languages	PGL, ZGL, STGL, MGL				TSPL-EZC
RFID Labels	Types	Standard / On-Metal / Other			Standard	
	On-metal tag thickness support	Thickness up to 0.088" (2.2mm)		Thickness up to 0.05" (1.2mm)	N/A	
	Label Pitch	Down to 0.625" (15.9mm)				
	Calibration	Automatic				
Chip (IC) / Inlays		Chips: Support for all mainstream chips and many new advanced chips. Inlays: Support for all common inlay designs. Check our RFID Solutions webpage for the latest list of supported chips and inlays.				
RFID Data Validation		Encoding Failures: Full/partial label overstrike (Depends on label length) RFID Label Counter: Tracks good/bad labels				Encoding Failure
Print Resolution		203 dpi, 300 dpi, 600 dpi		203 dpi, 300 dpi		203 dpi
Max Print Speed		14 ips@203 dpi, 12 ips@300 dpi, 6 ips@ 600 dpi	12 ips@203 dpi, 10 ips@300 dpi	12 ips@203 dpi / 10 ips@300 dpi	8 ips@203 dpi/ 6 ips@300dpi	Up to 5 ips @203 dpi

Labels are also an important component of RFID. TSC has the industry expertise and production capabilities to provide the RFID labels you and your customers need. We sell labels through trade only in addition to our RFID printer and encoder expertise. Our label experts ensure you receive the right labels and RFID technology for your application. Whether you want to replace an existing RFID label or are new to RFID technology, we can provide the proper RAIN RFID labels.

For further information about our RFID labeling solutions, please visit our website or contact your local sales representative.

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