RFID Hits Critical Mass

The benefits accruing to Macy's, Inditex and other apparel retailers are driving awareness about the accuracy, visibility, speed and efficiency that RFID brings.

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FOR MORE THAN A DECADE our firm has had the privilege of authoring *Apparel's* annual report on developments in the fields of RFID and IoT. The report's scope actually extends beyond the world of apparel, footwear and fashion accessories. The technologies we track are also being used in other consumer product categories. Our report will also be relevant to those segments of the market.

The range of professionals who read this report has typically been broad. Of the readers who work for retailers or brands, a variety of functional groups are represented, including specialists in store operations, loss prevention, supply chain, production, sourcing, IT and finance.

Our goal is to position you to make informed decisions based on your organization's unique objectives and commercial realities. As you read this report, bear in mind that there is a considerable amount of information that cannot be shared due to confidentiality obligations.

Independent academic study confirms RFID's value

A study titled "Measuring the Impact of RFID in Retail" was completed by Professor Adrian Beck of the University of Leicester and released by GS1 UK. Because it studied the use of RFID at 10 retailers, it is said to be the most comprehensive academic study to date on the use of RFID in retail. Similar to the findings of the Retail Analytic Council's excellent study

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of Macy's data, Professor Beck's study found clear evidence of RFID's positive impact on revenue and inventory accuracy. A diverse set of businesses were studied: adidas, C&A, Decathlon, lululemon, Marks & Spencer, Tesco, River Island, John Lewis, Marc O'Polo, and Jack Wills. Collectively these companies were using almost 2 billion RFID tags per year. That figure is now likely even higher.

All 10 companies experienced a positive ROI. Inventory accuracy was elevated to 93 percent - 99 percent (from starting points of 65 percent - 75 percent). Revenue lift averaged between 1.5 - 5.5 percent. On the cost side, five of the ten retailers reported a reduction in their inventory levels, and the reductions ranged from 2 percent - 13 percent.

Specialty apparel retailers

Inditex stated in March that RFID is fully deployed in Zara and will be fully deployed in 2018 in three other business units (Massimo Dutti, Pull & Bear and Uterqüe). Those four businesses together account for 80 percent of Inditex's revenue. Its remaining businesses will have RFID by 2020.

In 2017, H&M declared that 2018 would be a big year for its RFID program. And they were true to their word. In its March 2018 earnings call the CEO of H&M indicated that RFID would be rolled out to roughly 1,800 stores in 2018 and many more in 2019. RFID is one of the company's core strategic initiatives, alongside investments in advanced analytics and supply chain flexibility.

A massive source tagging program at Uniqlo has been underway for quite a while. More than 50 percent of the company's stores now use RFID. In 2018 its parent company (Fast Retailing) reiterated that it wants to operate with all of its merchandise tagged. Uniqlo accounts for about 90 percent of Fast Retailing's revenue, and RFID has already been rolled out at one of Uniqlo's sister companies.

Department store developments

OPERATIONAL IMPROVEMENTS

Any review of this sector must begin with Macy's. It is the largest in the space, and it is the most experienced with RFID. In June, at the GS1 Connect conference, Macy's provided a rare update on its RFID program. In 2017 its stores scanned 800 million units, resulting in 40 million corrections to the company's item file (its inventory record). The accuracy of that record deteriorates each month at the rate of 1.5 percent net and 5.8 percent gross.

Improved accuracy has increased the speed, efficiency and profitability of Macy's "fulfill-from-store inventory" program. This is especially important because approximately 50 percent of the company's picks are single-unit picks. A key measure of efficiency and speed is a metric called initial fill rate. The success rate for items with RFID is significantly higher

than for untagged product. Macy's is also excited about the positive impact RFID has had on its in-store pickup program, the improvements in on-shelf availability more generally, and the extra revenue (to Macy's and its vendors) resulting from quicker reordering.

CRITICAL MASS OF TAGGED PRODUCTS

One hundred percent of Macy's private-branded merchandise is being tagged, and roughly 75 percent of vendor merchandise is being tagged. How quickly will Macy's reach its objective of having all inventory tagged? Consider this:

- Private brands currently account for 29 percent of Macy's revenue. The CEO wants it to be 40 percent.
- Vendors who elect to ignore the tagging requirement are subject to a charge of 60 cents per shipped item.

But the real story here is about Macy's competitors, not Macy's itself. Macy's is often a vendor's largest account. Many vendors have begun attaching RFID tags to their entire production runs, including product destined for retailers that have yet to invest in RFID capabilities. Once around 35 percent of a vendor's items need tags, it is usually cheaper to tag the entire production run than to segregate inventory. The result? The critical mass of tagged merchandise inside the stores of Macy's competitors is large (and growing). RFID Sherpas estimates that Belk, Dillard's, JC Penney, Lord & Taylor and Hudson's Bay stores already collectively average more than 30 percent.

One recent study of department store chains found that on average more than 100 brands were shipping tagged merchandise, including many of their largest partners. Some brands are tagging every unit they ship. Others are only tagging select product lines. What matters with this latter group is that they could be tagging many more units than they currently do. If a retailer concurrently begins to tag its own private brand merchandise, the level of tag penetration in entire product categories will quickly spike, and those categories could then be managed much more effectively.

MONEY FOR NOTHING, THE CHIPS AIN'T FREE

If these tags were free, no one would care. But they're not. The cost of the RFID tag is often built into the cost of the product, and the number of vendors adopting this practice will continue to rise. We estimate that Macy's primary competitors are now collectively paying more than $20 million per year for tags they don't yet use.

To be clear, we are not suggesting that these retailers are asleep at the wheel. Given that Macy's was (and is) the largest of the department store chains, and the one best positioned to generate source tagging by vendors, allowing Macy's to lead that campaign always made sense. And surely these competitors have always known that until they introduced new

RFID-driven processes in their own stores, there would be actual "out-of-pocket" costs. Fortunately for all of them, the cost of implementing basic RFID solutions is not prohibitive.

PROJECT ZIPPER

The great work being done by the Project Zipper team also suggests that activity amongst this group of retailers is set to spike. Project Zipper is a joint venture between GS1 US and Auburn University. Phase 1 of the initiative involved five retailers (including Macy's) and eight merchandise vendors. The pool of participating companies will be even larger in Phase 2.

A series of RFID and blockchain use cases in the department store channel are being studied, with an eye to unlocking value and enhancing trading partner collaboration. The key use cases studied included investigating claims, electronic proof of delivery, and RFID enabled vendor scorecarding. Phase 2 will focus on understanding the business value associated with anti-counterfeiting, authenticity and pedigree.

The brands that used RFID to verify packing accuracy before shipping to retailers were error free and did not receive a single chargeback claim from retailers in 10 months. This is in stark contrast to those not using RFID, where 69 percent of orders from non-reconciling brands had an ASN/UPC mismatch. This is an amazing statistic.

LP departments starting to use RFID data

In last year's report we said it was reasonable for CEOs to expect their loss prevention teams to make much better use of the RFID data being generated. We are impressed with the progress that was made this year.

For decades, LP teams have relied on in-store sensor technologies such as EAS and video to deter theft and maintain a safe environment. However, as retailers evolve, so do the criminals, and what worked in the 1990s is less effective today. This reality, coupled with the fact that the internet offers a global "fence" for valuable merchandise, has emboldened amateur and professional shoplifters (Organized Retail Crime).

Smart exits combine traditional EAS systems with RFID portals and traffic sensors to combat thieves of all levels of sophistication. This is accomplished by capturing RFID reads at the exit and comparing them to POS transactions. When items leave the store without an associated sale the event is flagged and integrated with digital video to provide highly actionable data for investigators. Depending on the environment and goals, this solution can act as a real-time tool or can be used in a post analysis mode to build strong, high-value, felony cases and identify trends that lead to apprehensions.

Serialized RFID data is also being used to detect fraudulent returns, instances where a person attempts to return stolen merchandise in exchange for a refund or store credit. The growing popularity of Coinstar-type machines that pay cash for gift cards is contributing to this problem. In some cases, the thief does not even exit the store before brazenly seeking to "return" what they pilfered. Using serialization, the retailer can confirm whether an item was in fact sold, along with its price and date of sale. This information can now be used to determine whether, and how, a receipt-less return should be processed.

The real news isn't the existence of these solutions. The news is that they are now being put to good use.

Tips for success within your stores

The list below is far from exhaustive. It is informed by many years of experience in a wide range of retail environments.

• In our experience the variable with the greatest impact on the success of your program will be the amount of attention you devote to the people side of RFID — to support the steady uptake of new procedures, methods and mindsets. It's not nearly as easy as it sounds, and it often requires a considerable amount of monitoring, coaching and re-training. Our firm is often asked to assist with this. Retailers often underestimate the support needed to refine pilot stores into model examples of how to use the technology. Sometimes this gets overlooked amidst the flurry of rollout planning activity.

• Your internal project leader must have the ability to devote most (if not all) of his or her time to the project, in partnership with a full time representative from IT. If project management is not led by a store operations leader, then a 50 percent resource from store operations is advisable, to properly support store process re-engineering. Moving into and through the rollout phase, a full-time store operations leader will be required, plus at least 30 percent time from inventory control and merchandise planning/allocation representatives.

• The pendulum swings far in the direction of operations, stock organization, managing inventory, and away from areas such as customer service and visual merchandising, while stores work to gain control on new opportunities exposed. A holistic approach is needed. High levels of product representation can be obtained without compromising aesthetics.

• In the pilot phase, try to avoid tasking your store associates with tagging inbound merchandise. Not only is it a burden, they are more likely to make mistakes. It is better to have items tagged upstream, because that reflects what your "future state" process will actually be.

• Leverage your company's analytics specialists to sift through the big data return your pilot will bring.

Solution landscape

Clients often ask us to evaluate their planned technology investments. Within the past 12 months we have seen an uptick in questions about software as a service (SaaS) solutions and about options for capturing RFID data at checkout.

SOFTWARE AS A SERVICE

SaaS has gone from being an interesting deployment option for retailers and brands to consider, to being an absolute "deal breaker" for some retailers choosing their RFID platforms. Several years ago, when we first discussed SaaS solutions, there weren't many options out in the marketplace. Things have changed. Today, most of the major RFID software solutions have introduced (or will be introducing shortly) a SaaS solution option.

However, be aware, not all SaaS solutions are created equal. If you have decided that a SaaS solution is right for you, and there are a number of reasons you may come to this conclusion, then there are a few things that you should be aware of when choosing your SaaS provider:

SaaS Is Not Merely A Commercial Term

We have heard multiple software providers say that SaaS is simply a commercial term and not a software term. We do not agree. A true SaaS is a multi-tenant application which is scalable, extensible, robust and easily integrated with a full complement of APIs. A SaaS is not taking an existing solution and hosting it in the cloud for a particular installation. This is called a managed solution and not a SaaS.

Why are we calling this out? A SaaS solution should be multi-tenant, which allows you to take advantage of all changes and enhancements being made in the software for other users of the software. Also, the multi-tenant offering (assuming the vendor has other customers) should help them reduce their cost footprint in a number of ways, including: 1) the cost of set-up, installation, and configuration; 2) the cost of the back-end infrastructure; and 3) the cost of support. All of these savings should work their way back into your pocket. They also reduce the risk of your projects, as mistakes happen on the configuration and set-up of solutions more often than most providers would like to admit.

Compare Apples to Apples

SaaS solutions vary in functionality. Also, a company's SaaS solution may not yet have all the capabilities of its traditional on-premise solution. When comparing solutions be sure to "spec out" what your exact requirements are and be sure to ask the vendor to clearly identify any functionality that is not supported in both the vendor's SaaS offering and its traditional on-premise solution. You will find the biggest differences when looking at fixed infrastructure solutions (including hands-free solutions) and in off-line capabilities. Also, while all SaaS solutions include store capabilities, not all include DC and other upstream functions.

Battle Tested

Building a scalable, robust and extensible RFID solution is not easy. If it were, everyone would develop one. Ensure that the provider that you are selecting has experience deploying solutions similar to your scope and scale on their platform. Ask for qualifications and follow-up with reference checks. Ensure that they have a proven history of handling a deployment similar to yours, especially when it comes to: 1) your overall requirements, 2) the number of stores, simultaneous users, and items, 3) the number of simultaneous cycle counts their solution can handle, and 4) your data needs.

When/Why Should I Consider a SaaS?

At the end of the day, each organization should be committed to finding the best, most secure, and functional tool that allows its people to focus on doing their jobs to the best of their ability. In some cases, this will be a SaaS solution. What should you be considering when making this decision?

- *Functionality:* You must understand what your current and future needs are before you can determine if you need an on-premise solution or a SaaS solution. Take the time to flesh this out in detail before making any software decisions.
- *Total Cost of Ownership ("TCO"):* The cost of a SaaS solution needs to be weighed against the holistic costs of deploying an on-premise solution. This includes all hardware, software, installation, configuration, training, support and maintenance. Depending on the solution you choose, the TCO can be lower with a SaaS. CapEx versus OpEx considerations sometimes also factor into these decisions.
- *Your IT Group's Bandwidth and Capabilities:* Is your IT staff already pushed to the limit in terms of what they can support? Does your team have the skill sets to deploy and support a new system? While vendors selling a SaaS solution will often say that extremely little IT effort is required, this is not true if you want to do any integration with your legacy systems. Make sure you understand what level of internal effort is required.
- *Your Existing Enterprise Infrastructure:* Can your existing store and DC physical infrastructure support a SaaS solution? How good is your on-site Wi-Fi connectivity? What is your broadband connectivity? What is the cost to upgrade them to make a SaaS a viable option?
- *Speed to Deployment:* SaaS solutions will always be faster to deploy, but faster isn't always better if the solution doesn't meet your needs. The speed to deployment is very useful when trying to spin up a pilot quickly.

Beyond SaaS?

It is worth noting that a new breed of solutions has begun to hit the marketplace that we are very interested in. It is a hybrid solution offering that is part SaaS and part IaaS (Infrastructure as a Service). It couples hardware, software and even sometimes tags into a single cost base.

CHECKING OUT POS SOLUTIONS

Many of our clients have approached us asking us how they should best incorporate RFID technology into their point of sale. Many are surprised by our answer. While there are many slick ways to deploy RFID at POS, we firmly believe that the best solution is the simplest solution that meets all your needs. To this end, you must ask yourself, why are we looking to incorporate RFID into our POS?

Is Additional Hardware Necessary?

RFID hardware at checkout might be necessary if you are seeking to automate or enhance checkout, or if you are looking to implement a "smart detach" solution for removing anti-theft tags. But if you simply need to capture serialized tag information at checkout — to detect returns fraud or to implement a smart exit solution — then you can accomplish that much more economically with 2D barcodes or QR codes.

The cost of implementing RFID hardware at all registers can be very significant. It is not only the cost of the RFID hardware that must be purchased at each register. There are also costs associated with power, network, space, integration and testing.

The barcode-based approach is much cheaper because most POS hardware is already capable of reading a 2D or QR code. Hardware changes at POS are usually not required. The only costs that must be considered are:

- Software changes at POS that would capture an EPC number and let your POS software transact on the data before sending this information to your RFID system.
- A modest increase in the cost of your price ticket.

The last consideration when making this decision is not commercial. It is aesthetic. Are you comfortable incorporating a QR Code or 2D barcode onto your product? Most companies are. QR codes/2D barcodes can also be added to sewn-in labels. It is not as simple, but it is definitely worth considering.

A Third Pathway

Our retail clients often inquire about POS integration because they want timely inventory updates to improve intra-day replenishment and intraday stock accuracy. This scenario does not require the system to know the specific serial numbers of the products that have been removed from inventory. The system only needs to know the new SKU quantity.

Fortunately, it is possible to leverage your existing POS transaction data to adjust your RFID inventory position. If you sell a unit, you simply decrement that quantity from the RFID inventory. If you return a unit, you increase the quantity within your RFID system.

The key benefit of this solution is that no changes to your existing POS system are required. No hardware changes. No software changes. Merely a data feed connecting your RFID system and your POS system. This can usually be set up in less than a day.

Remember, though, that because this solution does not capture the serial number of the sold item, you will not be able to:

- Utilize smart exits
- Validate receiptless returns
- Perform fitting room analytics (Try/Buy ratios)

Fortunately, you can start with a software-only integration and then transition to one of the other options listed above once you want to begin using some of the above functionality.

Follow the leaders

It's no coincidence that the retailers most committed to the concept of inventory visibility are seeing excellent financial results. One example is Inditex. In June the company reported that over the preceding 24 months its revenue and gross profit had each increased at a CAGR (compound annual growth rate) of 8 percent. All of the company's Zara stores use RFID. Many began doing so in 2016.

On lululemon's August earnings call, one Wall Street analyst praised the company for its "stunning level of acceleration" in its financial performance over the past 12 months. In May, lululemon's COO stated: "A big part of our recent success has been our omnichannel focus on serving our guests and our ability to leverage this across channels. We continue to expand in this regard, with ship from store now available in nearly 300 locations. And we remain on track to begin the rollout of buy online, pick up in-store during the second half of the year."

Another great example is Target. All of the company's soft lines are source tagged, and other categories now have tagged product too. Kevin O'Dare had this to say at the *RFID Journal* conference in April: "Now that we have had a full year of proof of elevated accuracy in our soft lines categories there is a ton of interest across the company." In August, the company reported its highest increase in store traffic in more than a decade. Part of that is due to the successful introduction of BOPIS (click & collect). Target's online business is booming too. Digital sales for the period rose 41 percent. More than 1,400 stores do ship from store, with more than 1,100 offering same-day delivery (through Shipt).

Connected products

A very cool IoT application with apparel is NikeConnect. Nike has collaborated with the NBA. Every team's official basketball jersey has an embedded NFC chip. Consumers buy the jerseys and download the NikeConnect app on their smartphones. Tapping the phone to the tag is "an unlock to real-time, personalized experiences activated through the combination of the jersey, a smartphone and the NikeConnect app". In early September, Nike launched a similar jersey with well-known English football club Chelsea.

We find NikeConnect particularly impressive because:
- It's very clear to the consumer how they will benefit each time they tap their jersey.
- Often it will make sense to tap the jersey several times in a single day.
- The participation of the players throughout the year creates a steady stream of fresh, exclusive, premium content.
- When you buy an official jersey, you are now buying much more than a jersey.

To many apparel brands the appeal of NFC (and 2D/QR barcodes) will be that they will finally have a way of identifying (and interacting with) people who purchase their products from one of their wholesale trading partners. The ability to enhance a person's in-store shopping experience will also be valuable to brands and retailers alike.

NFC/UHF COMBINATION TAGS

The concept of a single tag that combines NFC and UHF RFID technology has existed for a while, but until now no one has been able to deliver on it in a performant, cost effective and scalable way. Good progress was made this year in improving the performance of these tags and reducing their cost, making them a viable alternative to having two separate tags on an item. We look forward to telling you all about the first large scale use of these tags next year.

Looking ahead

A surge in the number of global brands source tagging merchandise for key retail accounts is leading several prominent retailers to accelerate their rollout plans. Many of these global brands are taking steps to use RFID in their own stores too. A third group of companies — the traditional single-brand specialty retailers — are also stepping up their activity.

An opportunity of common interest to all retailers is the prospect of "doing more with less," namely, operating their stores with leaner inventory levels. We believe greater attention will be devoted to this over the next 12 months. We also think there will be interesting new success stories emerging from the loss prevention community.

The number of businesses looking to use RFID in DCs, consolidation centers and factories is increasing too, primarily to validate shipment accuracy. There is particular interest in establishing a more concrete evidentiary trail to help brands and retailers resolve chargeback disputes. Desire for clearer end-to-end supply chain visibility remains strong too. Emerging blockchain solutions have the potential to add tremendous value here. **APP**

About the Authors

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A recognized leader in the Canadian and U.S. RFID communities, John-Pierre has nearly 20 years of enterprise strategy and solutions integration experience. Prior to joining RFID Sherpas in 2010 he led the RFID practices of VeriSign and Bell Canada. Earlier in his career, John-Pierre was the Canadian Lead for the Mobility Solutions Practice of Capgemini.

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Marshall has advised the presidents of several leading apparel, footwear and consumer product companies. Before founding RFID Sherpas in 2007, Marshall led the North American RFID practice of Kurt Salmon Associates. He began his management consulting career at A.T. Kearney. Marshall has authored numerous reports on RFID and collaborative commerce.

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Kristen's deep understanding of retail processes and change management is informed by her 18 years of retail experience, most recently with Ralph Lauren. For eight years she has had national Retail Operations Director responsibilities. She has also led stores at the district level and served as National Director of Training & Recruitment. Kristen's RFID experience dates back to 2013.

Company Profile

RFID Sherpas is a retail consulting practice that assists global brands and retailers at all stages of their RFID journeys. The firm is vendor agnostic and does not re-sell RFID hardware, software or tags. The firm's services include process optimization, solution architecture, vendor selection, negotiation support, source-tag program design, strategic planning, ROI analysis and project management.