AN Apparel EXCLUSIVE REPORT

RFID AND IoT

Mirrors and smart fitting rooms are seeing renewed interest in a suprisingly wide range of stores.

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GOOD THINGS IN STORE

JOHN-PIERRE KAMEL, Principal at retail consultancy RFID Sherpas and **MARSHALL KAY**, Principal at retail consultancy RFID Sherpas.

Apparel's 10th annual review examines what did (and didn't) happen over the past decade in the world of RFID/IoT. A number of interesting new applications are highlighted that will be of interest to retailers and brands alike.

A lot has changed in the world of RFID in the 10 years since *Apparel's* first annual RFID review. The industry standards necessary to enable widespread use of RFID were carefully developed and broadly embraced. Technical performance improved dramatically. The price of tags and labels declined significantly. Terrific innovations emerged, such as woven RFID brand labels that are completely indistinguishable from a brand's current label. Big advancements in the field of retail analytics have created new sources of ROI. But most importantly, the commercial need for inventory visibility escalated significantly with the rise of omnichannel and the ubiquitous use of smartphones.

The much heralded Internet of Things ("IoT"), of which RFID is an important segment, has similarly had an interesting journey. Back in 2005 there was plenty of talk about smart refrigerators, smart medicine cabinets and, for those who love their clothing, smart closets. Then all this chatter went away, almost as quickly as it had emerged. It remained this way for many years until a spike in interest in 2014. During that long lull, a new set of sensor-based retail solutions was invented and refined, setting the stage for big breakthroughs in store operations, merchandising and customer experience that we'll see over the next 10 years. ▸

Aspiring real estate agents are taught that the three R's of real estate are location, location and location. In the world of retail, the three R's are data, data and data. The quality and timeliness of the data generated by RFID/IoT solutions is of great interest to retail analytics experts, and rightly so.

Whether you are at the very beginning of your RFID/IoT journey or you are well on your way to having these core capabilities, this report will be relevant to you. As always, regardless of whether you are a retailer, a brand or a technology provider, our goal is to position you to make informed decisions based on your company'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.

WHAT HAPPENED?

Not everyone is interested in looking in the rear view mirror. If you fall into that category, then we suggest skipping this section of our report. But we think there is value in taking a retrospective look.

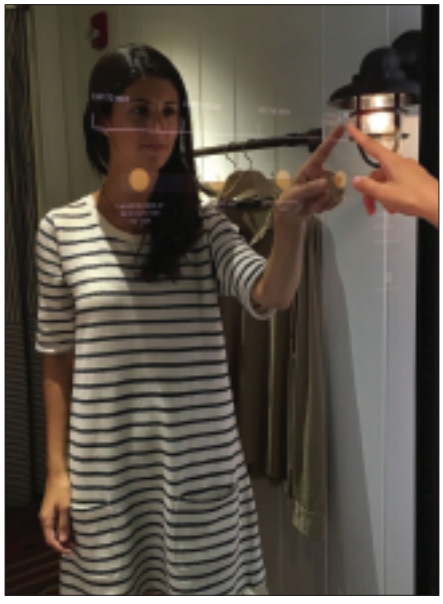
It is easy to forget that certain things that are now taken as self-evident today were definitely not back then. For example, back in 2006 it was not well understood that in the apparel industry RFID would primarily be a store-level opportunity, not a logistics opportunity, and that tagging would happen at the item level, not the carton level.

Some people believed, incorrectly, that stores would not be able to use RFID until it was first rolled out across all factories (and then all DCs). The true picture was quite different. Our message to clients was clear: get the item to the store with a tag on it *even if you do not try to capture value on the item's journey to the store* because the benefits within the four walls of the store are significant. Some people already understood this, but to others it was akin to learning that the world is round, not flat.

There was also a period of time, around the year 2007, when we began to see a number of apparel brands paying more attention to Magic Mirrors and smart fitting rooms than to RFID's value as an inventory management tool. For a while it looked like the number of companies adopting RFID to enable interactive retail experiences might match the number of companies doing so in pursuit of inventory accuracy. By 2009 it became clear that this would not be the case. (Even though we are big believers in the power of interactive retail — and we are happy that mirrors and smart fitting rooms are now seeing renewed interest — we have always viewed these solutions as complementary. They should never be the sole reason for tagging your merchandise.)

Retailers and brands in 2006 often had questions about the type of RFID tag they should use. There were four primary choices: paper tickets, stickers, woven labels and hard plastic anti-theft tags. While it was commonly understood that tickets and stickers would pave the way in the initial years (including a migration towards integrating the RFID chip directly into the price ticket), what was less clear was the rate at which the other forms of tags would become popular. Not much has changed in the past 10 years. Paper tickets are by far the most common form of RFID tag for apparel (and stickers for footwear), and the other types of tags have been used more sparingly. This may change in the years to come, but what was once a big question has really been a non-issue for many years.

Perhaps the biggest shock of all, though, has to be the extent to which RFID remains almost completely unutilized as a loss prevention tool. To put this into proper context, in 2006 a significant number of LP professionals expected that RFID would *completely overtake* traditional EAS (electronic article surveillance) technology within five years. Many feared for their jobs. There are several reasons for this inaction, which we will likely expand on in another report. But this lack of progress has virtually nothing to do with the performance of the technology itself. This immense cost-saving opportunity remains well within reach, sitting in plain sight. ▸



The past year has seen a big increase in the use of interactive retail solutions, both on the sales floor and in the fitting room, to drive the notional "Smart Store."

Q: Trying To Satisfy Digital Demand with Manual Processes?

A: Automate Omni-Channel Fulfillment with Checkpoint RFID Solutions

RFID Sensors improve inventory accuracy. Checkpoint RFID solutions go one step further by automating omni-channel order fulfillment in stores and DCs.

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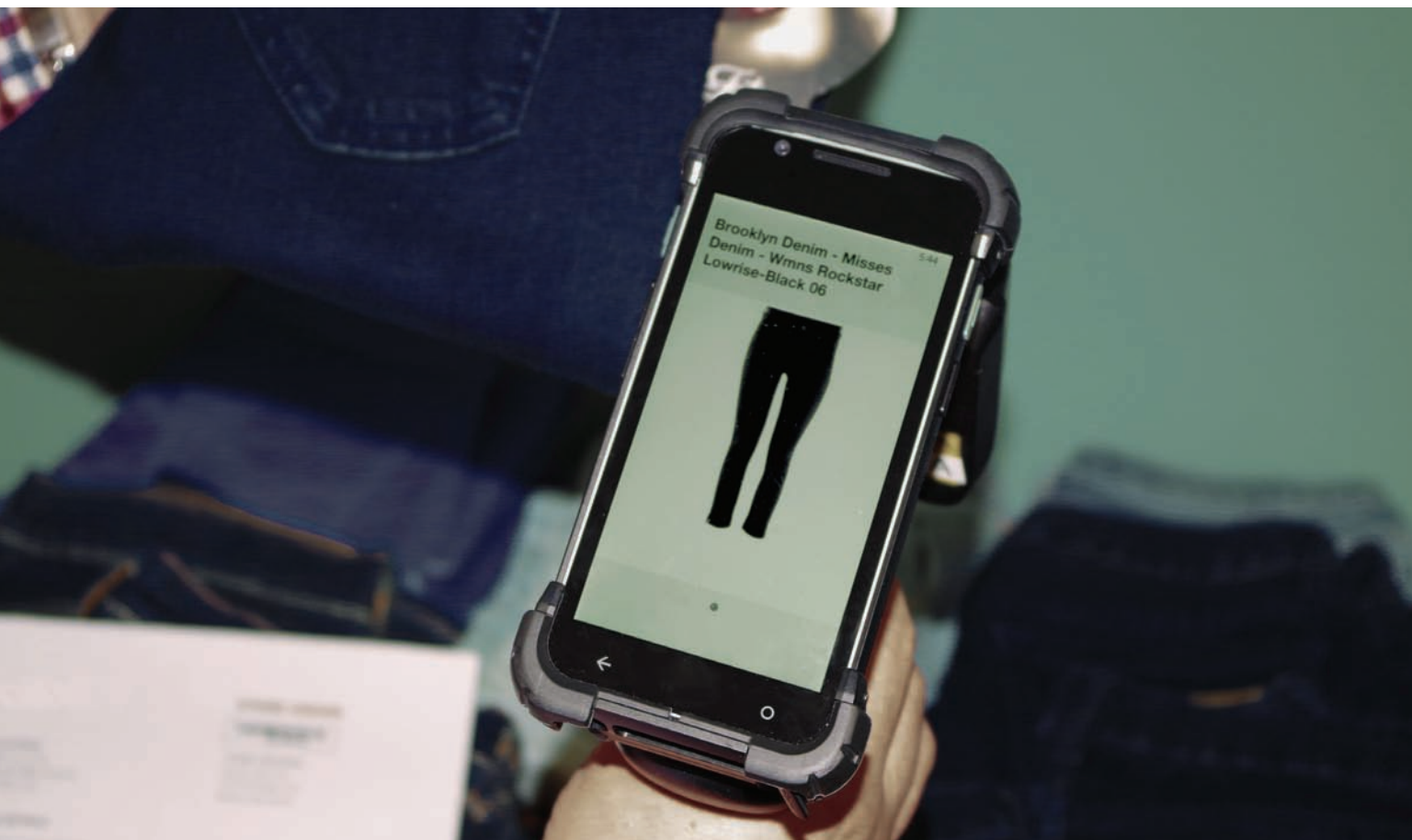

Download our infographic "Improving Omni-Channel Fulfillment with RFID"

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*or contact us at **mv@checkpt.com** to receive more information on our RFID Solutions for Retail, or to schedule a Business Process Consultant.*

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IoT: BIG THINGS IN STORE

McKinsey & Company projects that IoT solutions could deliver up to $11.1 trillion of economic value by 2025, with the retail sector accounting for $1.2 trillion. What then is IoT? At its simplest, IoT is a term used to describe machine-to-machine (M2M) connectivity. In an IoT world, sensors and other intelligent monitoring devices are used to automatically capture and share information on something's identity, status, history or condition. Devices essentially "speak" with other connected devices.

IoT applications in the world around us have quietly become commonplace. Smart meters now monitor the electrical consumption of homes and give "the grid" the ability to automatically curb energy usage in periods of high demand. In a smart home the temperature is automatically adjusted throughout the home, lights are automatically turned on when a person enters a room, and the front door can be programmed to automatically unlock when the owners arrive home. There are autonomous vehicles (such as the Tesla and soon to be released Volvo) that can automatically drive you to and from your destination.

Seamless automation is beginning to take root in the world of retail too. There are two general classes of retail IoT applications: operational solutions and shopper-facing solutions.

OPERATIONAL IoT SOLUTIONS

Operational IoT solutions help optimize the way retailers and brands run their businesses. Sometimes this extends into the realm of collaborative commerce. For example, smart fixtures can automatically alert the retailer/brand when an item is in need of restocking and have the capability of driving automatic price adjustments (dynamic or planned) based on the how often the item is being picked up by shoppers. These same fixtures can also help drive localized product assortment decisions.

The list of operational IoT solutions is quite long. Here are some examples:

- Smart CRM
- Inventory Visibility/Accuracy
- Smart Price Tickets (item/shelf)
- Planogram Compliance
- Layout Optimization
- Zone Productivity Visibility
- Time and Attendance
- Supply Chain Visibility

SHOPPER-FACING IoT SOLUTIONS

While operational IoT solutions help retailers serve their customers and run their businesses more effectively, shopper-facing IoT solutions are definitely sexier. In the past year we have seen a big increase in the use of interactive retail solutions, both on the sales floor and in the fitting room, to drive the notional "Smart Store." Shopper-facing IoT solutions often involve the blending of the physical and digital worlds to provide a more immersive and personalized shopping experience. This helps brands and retailers better connect with consumers, and helps brands forge stronger relationships with people shopping in the stores of their trading partners.

Shopper-facing IoT has immense potential. Here are some examples. Many of these customer facing applications also have a corresponding associate application which helps store associates meet the needs of shoppers in real time.

- Interactive Retail Solutions in the Fitting Rooms
- Smart Walls and Smart Surfaces on the Sales Floor
- Interactive Kiosk and Sales Floor Applications
- Assisted/Rapid Checkout Solutions
- Wayfinding for Shoppers and Associates ▸

BY THE NUMBERS

1%	Improvement in margin for every 5% increase in product display in the Designer Footwear category *(Source: RFID Sherpas)*
1	The number of units required to be in inventory in order for Macy's to make that unit available in their RFID enabled omnichannel program (i.e. no suppression)
15%	Percent of the addressable market for RFID tags currently tagged *(Source: IDTechex)*
18%	The CAGR of the RFID Smart Labels Market between 2016 and 2021, worth an estimated $10 Billion *(Source: Research and Markets)*
124	Number of companies in the RAIN RFID alliance (as of this writing)
4.6 billion	Number of RFID labels and hangtags shipped in 2015 for the apparel sector *(Source: IDTechex)*
10 billion	Number of intelligent apparel and footwear items estimated to be in circulation by 2018 *(Source: Avery Dennison)*
$1.2 trillion	Estimated annual value driven by IoT within retail by 2025 *(Source: McKinsey & Company)*

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Right store?

Authorized channel?

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The next section of this report explores how the things we wear can "come to life" in exciting new ways.

THE INTERNET OF EVERYTHING?

An innovative new solution allows brands to attach unique digital identities to all items that they make. We think it has great potential. Its backers believe that over the next three years 10 billion pieces of apparel and footwear will be enabled with unique digital identities, each with its own data profile in the cloud. This enables new levels of interaction with shoppers never before possible. For example:

1. **Digital Closets:** Shoppers can benefit from personalized content based on the items hanging in their closet. Shoppers can essentially open their closet doors to retailers and brands. If the shopper "checks in" while in a retail store they would immediately receive recommendations with suggestions of items to try on. These suggestions can be restricted only to items known to be in stock in the store. This is merely one way this information can be helpful.
2. **Loyalty Rewards:** Shoppers can interact with their products to unlock personalized digital content, services, offers and extras, or link to third-party apps for other rewards and benefits. This lets brands interact with shoppers in new ways, since the customer relationship (and corresponding data) has traditionally been owned by the retailer, not the brand.
3. **Product History:** Information about product materials, manufacturing and distribution can deliver total transparency to shoppers about the product's origins and how it was made. These details can remain meaningful long after the date of purchase.

THIS YEAR'S BIGGEST RFID DEVELOPMENTS

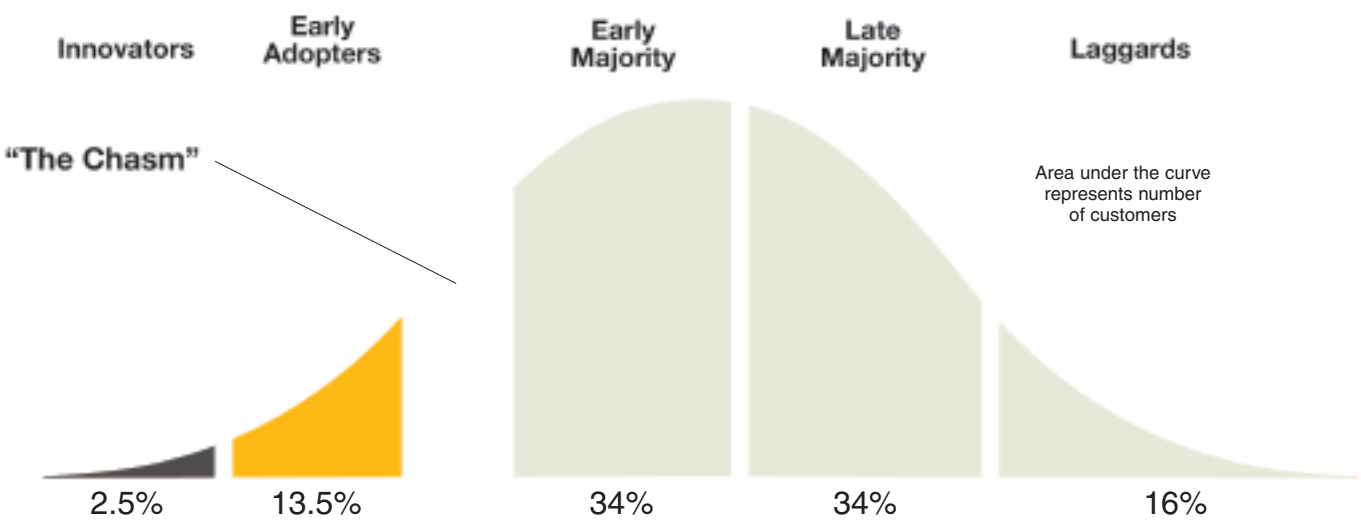
1. Omnichannel Now the Primary Use Case for Many Retailers: In the past, omnichannel would simply be one of many motivators for a retailer to pursue RFID. Increasingly, we are seeing instances where omnichannel is the primary reason why retailers are picking up the phone to get started.

2. Amazon Joins the RAIN Alliance: The company is already partnering with Auburn University's RFID Lab. Joining the 120+ member RAIN Alliance is a further sign of its interest in RFID. We believe Amazon will in the future be a heavy user of RFID in DCs (and will use RFID in its stores too).

3. Launch of a Major Shopper-Facing IoT Platform: As detailed elsewhere in this report, this platform could be a big turning point in the drive to create new wins for the consumer.

4. Action in the Sporting Goods Sector: Decathlon continues to set the pace in the sporting goods world. It has tagged more than 1.4 billion items, with more than 90 percent tagged at point of production. It is using RFID in each of its 1,030 stores and in all 43 DCs. Another European sporting goods retailer is in the midst of a chain-wide rollout. We know of other RFID activity within the sporting goods world. ▸

TECHNOLOGY ADOPTION LIFE CYCLE



Editor's Note: This diagram combines elements of two different models, the Technology Adoption Life Cycle curve from Everett Rogers' 1962 book Diffusion Of Innovations (New York; Free Press) and the chasm concept introduced by Geoffrey Moore in his 1991 book Crossing The Chasm (New York; HarperCollins).

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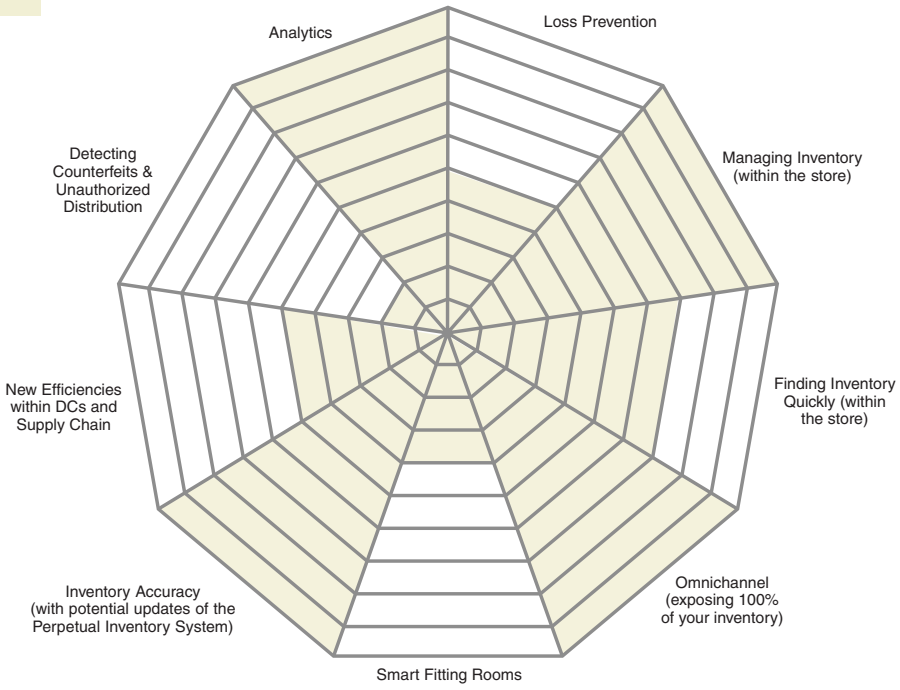
THE BIG PICTURE

We created generalized scores encompassing the entire spectrum of retailers of apparel, footwear and fashion accessories, regardless of price point or store size. There would naturally be some differentiation in the scores of a small luxury boutique when compared to the scores of a mid-market department store, a sporting goods store or a retailer such as Walmart. A low score for "Degree of Value Being Captured Currently" does not mean that the current solution is immature and not ready for broad adoption.

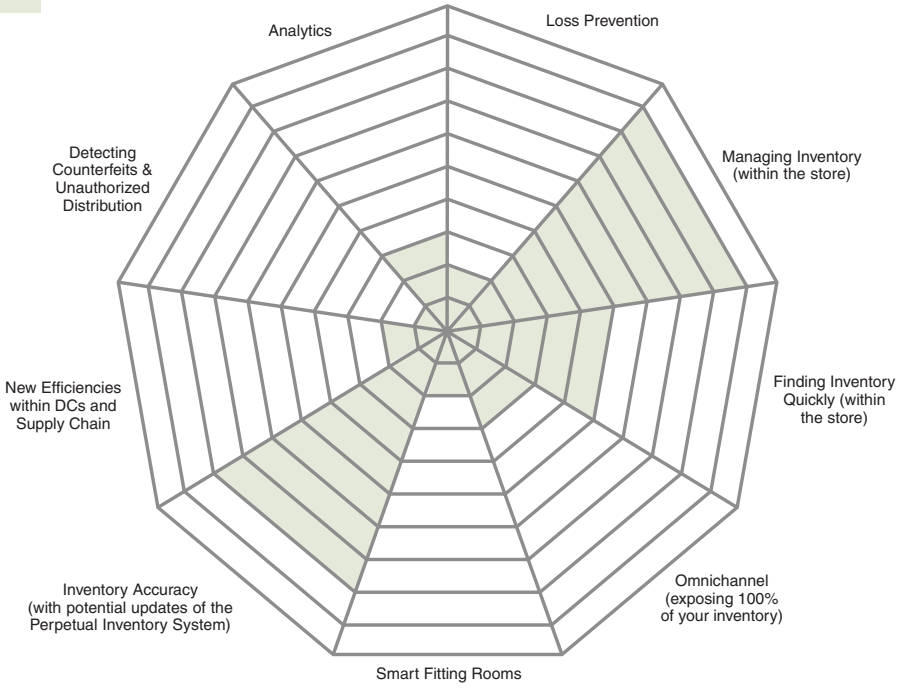
SIZE OF OPPORTUNITY:

This creates a score for the relative magnitude of the opportunity. Even areas with low scores for "Size of Opportunity" are still able to deliver significant return on investment. For example, knowing your precise inventory positions across each of your stores is, in our opinion, more important than having an RFID-enabled fitting room. But smart fitting rooms may often prove to be an excellent investment. The score also accounts for the number of companies to whom this specific type of benefit would be valuable. For example, counterfeiting is a much bigger issue for some brands than others.



DEGREE OF VALUE BEING CAPTURED CURRENTLY:

This speaks to the extent to which the companies currently using RFID are using the solution to create benefit in this specific area. A high score does not mean that all companies in the industry have adopted RFID tagging. A high score simply means that: a) this benefit is relevant to a very broad spectrum of companies; b) many companies are getting a high degree of value; or c) the tools for them to generate this value are quite developed and mature. Loss prevention solutions, for example, get a low score because they are underutilized, not because they are not currently capable of delivering tremendous value.



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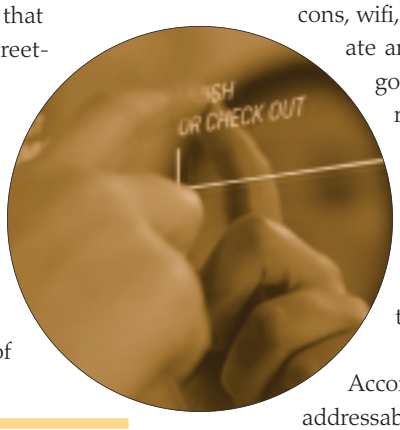
5. Contemporary and Luxury Brands Initiating RFID Programs: Q2 and Q3 2016 appear to be the strongest quarters ever for activity among contemporary and luxury brands. We are working with several such brands.

6. Authentication Tools for Brand Protection Agents: An impressive mobile solution has hit the market that makes it easier than ever for inspectors to discreetly verify that an item is authentic and came from an authorized distributor.

7. RFID Providers Incorporating IoT Capabilities: A record number of software and hardware providers are evolving their offerings. Hardware companies are adding sensory detection capabilities to their RFID devices, and RFID software platforms have been broadened to accommodate new forms of sensory data.



FINAL THOUGHTS

It is a sign of the maturation of RFID/IoT that the boardroom discussion has shifted away from being primarily a technology conversation. Instead the focus is on the problems addressed by these solutions and the positive impact on revenue and margins. Perhaps this is simply a reflection of where we are on Geoffrey Moore's famous Technology Adoption Lifecycle Curve After all, Visionaries are far more likely to engage in tech talk than the Pragmatists who populate the Early Majority market segments.

The integration of RFID data — especially the streams of information from hands-free systems — with store traffic, beacons, wifi, POS and social media data is going to generate amazing insights. In the next few years we are going to see pronounced changes in the way that retailers collect, aggregate and analyze RFID/IoT data. Simply put, there are new ways to use this rich information to let retailers know as much about what's happening in their stores as they know about their online customers. New metrics might soon be added to the retail industry's lexicon.

It is easy to forget that change takes time. According to IDTechEx, about 85 percent of the addressable market for RFID tags in the apparel industry remains untapped. Depending on whom you speak to, and depending on how you define "full adoption," it has taken anywhere from 20 to 50 years for the retail industry to fully adopt the barcode. RFID and IoT are taking flight at a much faster pace. And that's a good thing for shoppers and the companies that serve them. ■

ABOUT THE AUTHORS

JOHN-PIERRE KAMEL is a Principal at retail consultancy RFID Sherpas, a consulting practice devoted to the profitable application of wireless and mobility technologies. A recognized leader in the Canadian and U.S. RFID communities, he has more than 15 years of enterprise strategy and solutions integration experience. Prior to joining the firm John-Pierre led the RFID practices of VeriSign and Bell Canada, where he was responsible for all RFID sales, marketing and delivery activities. Earlier in his career, John-Pierre was the Canadian Lead for the Mobility Solutions Practice of Capgemini (formerly Cap Gemini Ernst and Young), where he led projects in mobile strategy and business development for many of North America's largest organizations.

MARSHALL KAY is a Principal at retail consultancy RFID Sherpas. Serving an international client base, the company provides a range of services to retailers and suppliers, including strategy consulting, business case analysis, planning, solution architecture, vendor selection and project management. Marshall also advises technology vendors, investors and industry associations. Prior to launching this practice in 2007, he directed the North American RFID program of retail consulting firm Kurt Salmon. During the course of his career Marshall has advised the presidents of several leading apparel companies.

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