

Leading solution providers speak out on the business and technology issues that will impact adoption in the near future.

By Jennifer Zaino

Tags: [Health Care](#), [Manufacturing](#), [Retail](#), [Supply Chain](#), [Innovation](#), [RFID Channel](#)

Jan 08, 2017—Since the founding of RFID Journal in 2002, we've watched people learn how to pronounce RFID (some said "ar-fid" and others "rif-id") and understand that it means radio frequency identification. We've seen early adopters develop business cases for using the technology, and have witnessed RFID go through the Gartner Hype Cycle—from the peak of inflated expectations, into the trough of disillusionment, up the slope of enlightenment and to a plateau of productivity in which many companies in myriad industries are achieving outstanding benefits.

As far as RFID has come, the journey is far from over. Which industries are rapidly advancing its adoption? What are the next wave of applications for this champion automatic identification technology? What innovations can we expect during the coming year? And what role will the technology play in a world increasingly influenced by the Internet of Things (IoT)?



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To find out, RFID Journal asked leading experts in the field to provide their insights on the state of the RFID industry and a glimpse into the near future: [Checkpoint Systems'](#) Umesh Cooduvalli, [Omni-ID's](#) George E. Daddis, Jr., [Impinj's](#) Chris Diorio, [SML Group's](#) Dean Frew, [NXP Semiconductors'](#) Ralf Kodritsch, [Avery Dennison's](#) Francisco Melo, [HID Global's](#) Mark Robinton, [Zebra Technologies'](#) Chris Schaefer and [Smartrac Technology Group's](#) Christian Uhl.

Current State of RFID

It turns out that retail is top of almost everyone's mind. Chris Diorio, Impinj's CEO, points to Macy's recent announcement that by the beginning of 2017, the retail giant plans to RFID-tag more than 60 percent of all items in most of its stores, and to have 100 percent of all items in all stores tagged by year's end.



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Macy's is taking a leading role here, but it isn't alone in advancing RFID in the retail space. Predictions made by [ChainLink Research](#) that more than 8 billion passive ultrahigh-frequency (UHF) RFID tags would be sold worldwide in 2016—60 percent in the retail market—are pretty much on the mark, says Umesh Cooduvalli, Checkpoint's senior director of product management, based on the vendor's own market intelligence and first-hand conversations with RFID buyers.

"It is the retail industry [that is the highest adopter of RFID], and, to be more precise, it is mostly about tagging apparel," confirms Ralf Kodritsch, the segment manager of RFID solutions at NXP Semiconductors (which [Qualcomm](#) recently announced that it would acquire—see [Qualcomm Buys NXP](#)). And these apparel implementations are impressive, he reports: Many projects run in the hundreds of millions of RFID tagged items.

Adoption in apparel retail is being spurred by the clear return on investment, Kodritsch and other experts say. Retailers can drive higher sales by making sure they have the right product on the shelf, in the correct size and color, and at the same time lower their inventory costs due to a more accurate supply chain.



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"Prior to using RFID, retailers' perpetual inventory systems were regularly only 65 to 70 percent accurate," says Chris Schaefer,

Zebra's senior director of global market development. So their inventory would be off by 30 percent, he explains, thereby affecting reorders and potentially resulting in lost revenue. "By solving this problem, retailers can establish a foundation of accurate knowledge, which can then be used to enhance a variety of other inventory-intensive processes in the store, driving even more value." Knowing the details of what you have, where it is and how it is used, Schaefer adds, is information that can drive all sorts of business intelligence related to merchandising, staffing, loss prevention, inventory planning and promotion planning.

The tide is turning, too, from retailers mostly tagging items in stores to source tagging and bulk encoding, Cooduvalli reports. "We are talking with retailers and brands about broader deployment of RFID throughout their organizations and earlier in the distribution process, to aid with assortment planning downstream," he notes. An increasing number of brands are chasing the tipping point, says Francisco Melo, Avery Dennison's VP and general manager of global RFID, at which time it becomes worthwhile for them to tag all merchandise at the source.



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"Most brand owners, like Herman Kay, that are tagging for retailer mandates are tagging at the source," says Dean Frew, SML's CTO and SVP of RFID solutions. "They reach a 'tipping point' at which it is more efficient to just tag 100 percent of their product rather than segregating inventory by RFID and non-RFID. There are numerous brands that are tagging 100 percent of their product, even though only 40 percent to 70 percent of their shipments require it." But, he adds, "benefits in supply chain implementations or RFID still remain a smaller component compared with in-store benefits."

Still, Kodritsch acknowledges that while annual retail growth rates in terms of tagged RFID pieces worldwide are in the range of 25 percent, the actual adoption rate is still relatively low related to the total market—NXP estimates it's in the range of 6 percent in 2016. Diorio agrees that there's room for growth. Retailers worldwide stock 80 billion units of apparel annually, he says, but only about 5 percent of that apparel is currently being tagged.



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Other industries also have been advancing their use of RFID, according to our experts. "Manufacturing industries, such as automotive, are definitely moving toward the 'industrial internet,' which boosts the use of RFID as an enabling technology," says Christian Uhl, Smartrac's CEO and chairman of the board. The industrial internet, he explains, is a "smart factory in which cyber-physical systems monitor physical processes, create a virtual copy of the physical world and make decentralized decisions." RFID technology, he notes, plays a "pivotal role because it is the most functional and economical solution to connect simple objects to the digital world."

Health care is a significant adopter of RFID solutions as well, Schaefer says, "offering lots of opportunities to improve efficiencies and asset visibility. And health care is a place where increasing efficiency and visibility can have a huge impact on patient outcomes."

In addition to retail adoption, mature RFID applications account for broad adoption to monitor access control and in the banking and transit sectors, says Mark Robinton, HID Global's director of business development and strategic innovation for identification technologies. Maturing applications are driving adoption for tracking returnable assets and in the laundry and waste-management sectors, he adds, but RFID implementations for asset tracking, manufacturing and traceability are still fragmented.

"Today, as RFID technologies continue to mature in reliability, cost and read range, we are seeing many other industries beginning to adopt in high volumes outside of retail, says George E. Daddis, Jr., Omni-ID's CEO. "The oil and gas industry," he says, "is tracking equipment used in contracted services [that is] shuffled and transported around to a variety of locations, for inventory management and to ensure required maintenance and validate and ensure non-counterfeit products." Manufacturers, Daddis adds, are using RFID to track work-in-process.

On Tap for 2017

Not surprisingly, experts cite continued growth and expansion in health care, manufacturing and retail, as well as in aviation and other sectors.



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—RALF KODRITSCH

In the retail industry, Frew sees growing interest in the U.S., European and Asian apparel and footwear sectors, especially in the United Kingdom and in Asian nations. "Another focus moving into 2017 and beyond will be scalability of solutions," he states. "If you can't deploy across your enterprise, than you can't get an ROI."

Schaefer points out that adoption will continue to move from tier-one retailers to mid-market chains, and retailers that have begun rolling out RFID in apparel categories will expand into new categories, such as sporting goods and electronics. In addition, he says, health care—especially hospital systems—will ramp up the use of passive RFID as a very cost-effective way to track testing equipment, IV pumps and other high-value assets.



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—GEORGE E. DADDIS, JR.

There is a strong trend to track fast-moving consumer goods, such as beauty-care items, perfume and fashion accessories, Kodritsch says, for both brand protection and supply chain management, to combat grey markets and channel diversion. Secure RFID chips, which offer cryptographic security, can be used to authenticate products, he reports.

Companies will continue to adopt RFID for access control, Robinton says, because the use case, solution and business model are all well understood and repeatable. For those reasons, he adds, we will see adoption in banking, health care and retail continue to grow. He also believes more companies will embed RFID into consumer items and medical devices for calibration and protection.

"In 2017," Daddis predicts, "we expect to see increased usage in automotive manufacturing, in the military as it transitions from older, more expensive technologies and in IT datacenters—each driven by its own economics." He cites Industry 4.0, a European Union initiative that is driving the adoption of IoT technologies and manufacturing automation.

The U.S. airline industry will be spurred onto a greater investment in RFID by Delta Air Lines' public investment in an RFID-enabled baggage-tracking solution, Schaefer says. "Their interest in RFID goes way beyond baggage," he explains, "as they investigate how to simplify traditionally laborious processes, like inventorying safety equipment on planes." Melo also expects to see significant movement in the aviation space. "We believe the industry will have tons of entrants and broader adoption," he says. "The aviation piece is one to watch for."

"RAIN's adoption is still in its infancy," Diorio says, "despite already connecting [tagging] billions of items per year, and we see the adoption patterns being repeated within and across industries." (RAIN RFID is an organization whose mission is to promote the adoption of EPC UHF RFID technologies.) For example, he says, Bank of America and Wells Fargo are using passive UHF RFID for asset management and data security, tagging racks and servers in their data centers to improve and accelerate asset-inventory visibility for compliance purposes. "Today's market for RAIN in data centers is already \$390 million," he states, "projected to expand to nearly \$2 billion by 2020."



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"In many cases," Diorio says, "the real benefit accrues to the consumer. Macy's has items in stock when you go shopping. Delta reduces the likelihood of losing your baggage. Hospital efficiencies improve your outcome as a patient. I see an increasing focus on consumers in 2017 and beyond."

Businesses, Diorio says, will actively promote RAIN's benefits to consumers, in 2017 and beyond—a vision consistent with [it] as a core part of the IoT. "Today, when people talk about the Internet of Things, they're usually focused on connecting powered electronic devices like smartphones and wearables," he says. "But fundamentally, the IoT is about giving digital life to everyday items—literally extending the reach of the internet by a factor of 100 to items such as clothing, airline luggage, pharmaceuticals, automotive parts, even food. RAIN is about connecting *everything*, and it, more than any other RFID or wireless technology, is central to that connectivity. Imagine the applications that can be built on RAIN connectivity. The value of those applications, and the transformation they will have on our lives, will be profound."



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Greater adoption of the IoT has had an impact on driving the use of RFID in retail- and fashion-related industries, as well as manufacturing, Uhl says. The IoT "offers vast potential for great opportunities, value creation and virtually unlimited use cases far beyond manufacturing, fashion, retail and the consumer experience," he adds.

Indeed, Uhl posits that the question that really should be considered is, "Which industries will not be affected by digitization? The industrial internet, retail and fashion are just three examples of what is to come. Other vertical markets, such as health care, pharma and automotive, look equally promising. In the mid and longer terms, the IoT and its enabling technology, RFID, will positively influence the way companies do business, governments act and consumers live."

Editor's Note: Part two of our trends report, to be posted next week, will examine cost concerns, technology innovations on the horizon, and past and future surprises.