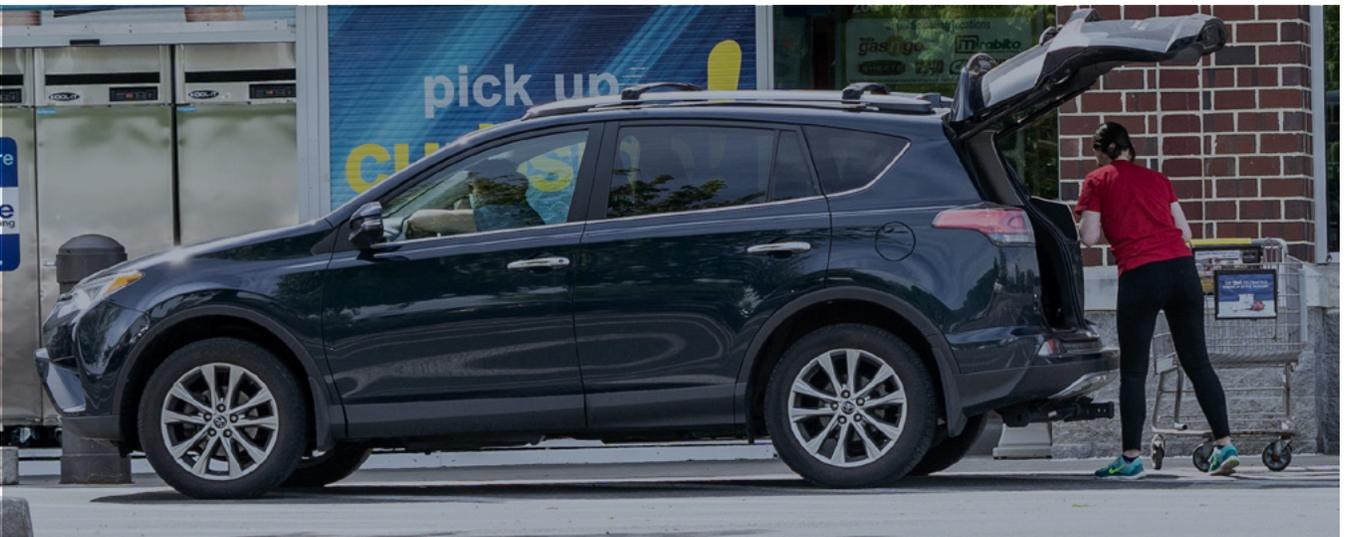


RFID AND INTERNET OF THINGS: ENHANCING OPERATIONS FROM SUPPLY CHAINS TO CURBSIDE PICKUP

SPONSORED BY

SIMPLYRFID



INTRODUCTION

RFID and the Internet of Things (IoT) are certainly not new technologies, but several recent developments in retail have given both of them that new tech “smell.” Some of the most notable trends include:

- **Global supply chain crises** have put a premium on retailers, manufacturers and shippers knowing the exact location of cargo containers and the products within them, making it an area where RFID can be an important data source;
- Retailers' desire to make popular BOPIS and curbside pickup operations more efficient and cost-effective has increased the need for **real-time inventory and item location data** within the store environment;
- **The increasing popularity of “smart” consumer devices**, including phones, home technology and automobiles, opens up new opportunities for IoT-enabled products to “talk” to them in ways that can support automated replenishment and provide retailers with a better understanding of post-purchase usage of these products; and
- **Rising consumer interest in circularity, sustainability** and product origins makes item traceability a valuable asset for brands, particularly those in the luxury space or those targeting Gen Z consumers.

RFID AND IOT: SIMILAR BUT DIFFERENT

John Harmon, Senior Analyst at [Coresight Research](#), provided the following explanation of the characteristics of these two technologies:



RFID is usually a passive electronic technology (i.e. it does not require electricity) consisting of a chip and an antenna. When you fire a radio wave at an RFID module, it energizes the chip and sends back an ID code. It's good for identifying items, their location and movement; applications include inventory and item tracking.



IoT means connecting a sensor or a device to the internet, e.g. WiFi or 5G wireless. These devices can take measurements and communicate interactively. Applications include connecting factory machines to the internet, tracking the location of delivery trucks and enabling cellular wireless that makes the deployment of items possible without deploying physical infrastructure.

5G enables the connection of millions of objects to the network, versus thousands with 4G and a much smaller number for WiFi.



RFID: INVENTORY ACCURACY AND BEYOND

RFID's main claim to fame — and it's a well-deserved one — is its ability to boost inventory accuracy at the store level. Multiple tests have shown that placing RFID tags on items and scanning with either handheld or stationary readers can boost accuracy rates above **90%**, a dramatic improvement over figures as low as **60%** that have been industry averages.

Better inventory accuracy is a benefit at any time, but the out-of-stocks and shortages that were prevalent during the worst of COVID-19 made it even more valuable. Additionally, BOPIS and curbside pickup, both of which were greatly accelerated by the pandemic, are made vastly more efficient when there's an easy way to know how many items are in the store and where they are at any given moment — in a back room, on a shelf, in an order prep area or on their way out to the parking lot.

"There's been a realization that, with online and multi-store operations, **the ability to take inventory weekly has changed everything**," said Carl Brown, President of **SimplyRFID** in an interview with *Retail TouchPoints*. As recently as "four to five years ago, no one was expected to have 'clean' inventory data. But now the killer app is [taking] weekly inventory with a handheld device. **With RFID tags at less than four cents each, that alone is worth the investment.** In that price range, it's very economical to tag everything."

Even what seem like modest improvements in inventory accuracy can help retail operations, and not just in the brick-and-mortar channel. Having accurate inventory updated on a weekly basis means that those responsible for online commerce "have to change their attitude," said Brown. "They can take this information and guarantee delivery. If the average store is **83%** accurate and RFID brings it to **94%**, that's still not perfect. But if RFID can find it, you can find it."

Inventory accuracy improvements have ripple effects both in terms of customer-facing capabilities and to support better demand planning — a big positive at a time when retailers are trying to precisely match assortments with consumer buying patterns.

"Improving inventory accuracy is a huge, powerful benefit!" said Coresight's Harmon in an interview with *Retail TouchPoints*. "Additionally, loss prevention has increased dramatically in importance recently. RFID allows retailers to know when items enter or leave the store or warehouse (legally or illegally) and when they are loaded or unloaded on a truck.

"RFID can also help identify/locate items to prevent food waste," Harmon added. "And Japan is mandating automation such as RFID in its convenience stores to mitigate an [expected] worker shortage by 2025. **There is also the 'Geiger counter' function of RFID scanner handhelds: an associate can locate an item that's possibly buried underneath a pile in the storeroom.**"



CUSTOMER-FACING USE CASES FOR IOT INCREASE AS SMART DEVICES MULTIPLY

By definition, IoT connects things — including products retailers sell and devices consumers use — to the web. These capabilities are poised to become important means by which retailers and brands can understand how consumers actually use products, as well as solving more strategic issues such as deciding which services to offer and optimal product allocation.

“Products have become incredibly smarter; they’re talking, but are you listening?” said Suketu Gandhi, a Partner in the Digital Transformation practice at **Kearney** in an interview with *Retail TouchPoints*. He gave the example of a consumer taking an IoT-equipped product home, where other IoT-enabled devices such as Alexa or smart home appliances are located. “Can I tie my information in with the product, so for example I can provide replacements when items are running out?” he asked.

Not only does such a use case encourage repeat purchases by an individual consumer, but the aggregated data “feeds back into buying patterns and supply chains,” said Gandhi. “It also allows retailers to get a better idea of what products or services consumers need. Services like **Best Buy’s** Geek Squad or **Costco’s** white glove delivery service are an important element for retailers to survive” during difficult economic times, he noted.

With aggregated data that’s collected virtually automatically, retailers can get the answer to key questions, Gandhi added: “What do I stock in a particular retail location versus a distribution center? What do I stock in a particular geography?”

Gandhi believes some of the biggest IoT opportunities start with now-ubiquitous smartphones. **“The biggest IoT device is in the customer’s pocket — that’s the thinking that needs to come in,”** he said. “That’s about bringing the customer into the ‘conversation’ versus being outside of it.”

IoT-enabled curbside pickup operations provide a strong example of both internal operations improvements and customer experience enhancements. For a customer that has opted in to having their phone tracked, the retail store “knows when I leave my house, and the typical route I take,” said Gandhi. “When I land at their door, there’s somebody there ready to load my car with my order.”

Creating what’s essentially a mini-supply chain within the store depends on IoT deployments, he added. The ability to know where items are at any given point means retailers don’t need to devote as much physical space to order prep. Data showing ordering patterns, including the busiest times for curbside pickup at a particular location, allow retailers to better manage the labor involved in filling these orders.

Additionally, when information about what’s in a customer’s order is matched to their previous purchases and/or items they’ve expressed interest in, retailers can make a personalized offer that can lead to incremental sales. “A retailer could say to [a curbside pickup] customer ‘It’s wonderful that you’re here, if you come into the store right now I have something special for you,’ said Gandhi. “It allows you to draw customers back into the surprise element of the store.”

RFID tags also offer use cases outside the store environment. “There are RFID tags that can be activated and deactivated wirelessly, enabling [better] loss prevention and easier returns,” said Harmon. “RFID can also play a role in identifying genuine merchandise versus counterfeits, particularly in luxury goods. Innovators have developed plans to use RFID tags to enhance loyalty, for example offering exclusive events for **Chanel** bag owners.”



CAN RFID AND IOT HELP REMAKE SUPPLY CHAINS?

Global supply chains have had a rough couple of years, and while some of the factors — primarily the multiple impacts of COVID-19 — are abating, the impacts of others, like the war in Ukraine and labor shortages, keep cropping up.

RFID tags placed on pallets and cargo containers were vital to helping Stanley Black & Decker during the pandemic, according to Guru Bandekar, currently VP of Global Supply Chain for Carrier but formerly with Stanley. “During peak COVID times, we had close to a billion dollars of inventory ‘on the water,’” said Bandekar in an interview with *Retail TouchPoints*. “There were port delays on both sides of the Pacific and a lot of congestion. Having that information collated, between the sensors on the container and the bill of lading data from suppliers, allowed us, every morning, to understand where the containers were and which were opened on any given day. And once the containers landed in the U.S., we could analyze patterns around traffic congestion not just at the ports but on the road. **All of this allowed us to get excellent visibility in terms of the material flow, and also track how much of that inventory value was getting freed up every day.**”

Bandekar hopes these types of regular updates can become permanent parts of retailers' supply chain toolkits. “As we go back to a hopefully more normal time, with just-in-time inventory management, these solutions will continue to be helpful,” he said. “**It would be good to build on it and not treat it just as a crisis response mechanism.**”

IoT sensors, which in general carry a higher price tag than RFID tags, can be embedded with additional information during their journeys. “For some higher-end products, these types of functionalities exist — in fact, some are resident in the products themselves,” said Bandekar. “Both for supply chain efficiency and also sustainability reasons, that’s a way to encode the whereabouts of that product, although for most consumer products it’s cost-prohibitive. But if you’re talking about things that people care about on the ESG side, like a product’s country of origin or whether it was mined ethically,” IoT could be part of the technology solution.

“IoT exists everywhere,” said Kearney’s Gandhi. “**It’s about what question you’re trying to solve.** Consumer use? Product combinations? Supply chain and inventory efficiency? Circularity? You can work backward on all of those to see how IoT fits.”

LEARN MORE...

SIMPLYRFID

SimplyRFID is a software development company that makes radio-frequency ID tracking systems. RAIN RFID is a technology using low-cost (5 cents) microchips we can attach to just about anything and inventory where they move. We track millions of IT servers, pharmaceuticals, clothes, military equipment, and regular old laptops primarily in the USA, Canada, and the UK.

703.343.1689

support@simplyrfid.com



retail TouchPoints®

Retail TouchPoints and *design:retail* give all members of the retail world access to a vibrant community that combines insights, inspiration and opportunities to interact with their peers. We sit at the intersection of the art and science of retail strategy, providing granular data, high-value commentary, and aspirational success stories to help readers optimize customer experiences across all channels. Touching all facets of the retail ecosystem, including store experience and design, workforce management, digital marketing and engagement, and omnichannel optimization, our editorial content, multi-media resources and events take timely news and trends and transform them into tactical takeaways that meet the unique needs and priorities of our executive readers.

201.257.8528

info@retailtouchpoints.com



ABOUT THE AUTHOR

Adam Blair, Editor

Avid theater-goer, intrepid journalist and grammar nag. There's always something new to learn about retail technology.