



# THE INTERNET OF THINGS AT WORK

The reality of IoT in retail may look more familiar than you think

by SANDY SMITH

**If there was any doubt that the Internet of Things in retail is having its moment, Steve Rowen questions it no more.**

The moment of realization came not through a plethora of headlines and research reports, but at NRF's annual convention in January.

"Sometimes a show floor can feature lots of far-distant, futuristic ideas," says Rowen, a managing partner at RSR Research. "This year we were pleasantly surprised by how many practical applications were there."

IoT is being enthusiastically received in retail. But until now, there has been a question of how it translates into real-world use.

## TANGIBLE IMPLEMENTATION

The Internet of Things is comprised of everyday objects that are Internet-enabled, allowing them

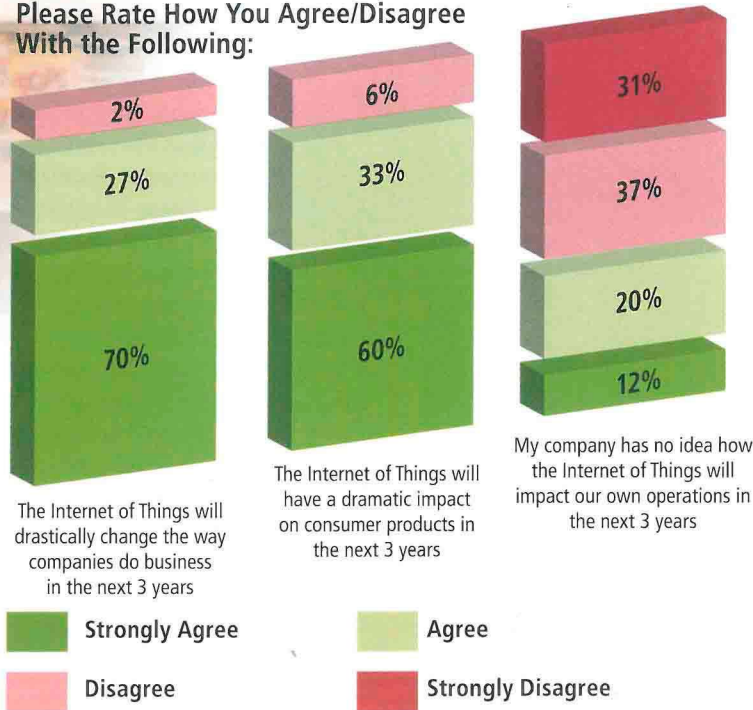
to connect to each other and share data. Gartner anticipates that in 2017 there will be 8 billion connected devices this year — 26 billion by 2020; other forecasters anticipate 50 billion, even 100 billion.

Any conversation about IoT in retail can quickly move to a discussion of checkout-less stores or artificial intelligence. In reality, it's not all that cutting-edge: Ask retail experts where IoT is headed in the near-term and they'll point to radio frequency identification, a technology patented more than four decades ago.

"You could argue that the Internet of Things isn't disruptive because a lot of the technological components have been around for a while,"



**Please Rate How You Agree/Disagree With the Following:**



# IoT Surveys Say:

The Internet of Things in retail is well studied. Some recent research shows:

**82%**

of IoT users say they've seen an increase in business efficiency

**81%**

have seen their organization's IT become more efficient

**78%**

saw an improvement in customer experience

**77%**

have seen improved visibility of processes across the whole organization

**73%**

have achieved cost savings

**72%**

declared a profitability increase

Source: The Internet of Things: Today and Tomorrow, HP Enterprise, March 2017

says Leslie Hand, vice president of IDC Retail Insights. "We think it's the use cases, the way that the technology is being used, that enables digital transformation and tremendous business disruption and value."

Chris Kozup, vice president of marketing at Aruba, a Hewlett Packard Enterprise company, says retail is at the leading edge of industries looking to adopt IoT use cases. "It's not the leader," he says, "but it certainly is within the top five industries that are finding and using different IoT applications."

It's a rapidly changing area, one in which "we are seeing things actually start to take root and seeing adoption," says Dan Mitchell, director of the retail and consumer packaged goods global practice for SAS.

If anything, retailers are moving from the "trough of disillusionment," says James Hendrickson, senior product manager of retail solutions for Honeywell. "We've been talking about omnichannel for the last five years. Now we have tangible things that we can implement today."

### NEW USES FOR OLD TECHNOLOGY

E-commerce and omnichannel have made it vital that retailers know where inventory is, and Mitchell says retailers are putting their money into RFID and inventory tracking. "I was always enamored by the promise of RFID, but it seemed there were so many barriers to entry," he says.

"Now it seems it's mainstream."

It is a heavy lift: Macy's made significant investments in RFID in 2015 but avoided cosmetics and jewelry since effective tags were difficult to find. Late last year, however, the company announced that all of its inventory — 100 percent — would be RFID-enabled by the end of 2017.

Mitchell sees much more possibility for RFID and accurate inventory. "On top of that, we can bring to bear a more accurate demand signal and service levels to see hiccups that are happening in the distribution network. It's the key underpinning of what we dub 'omnichannel analytics.'"

Omnichannel is driving changes in stores — every store is essentially a distribution center. Honeywell, the maker of safety and productivity solutions, is exploring ways to bring the science of technology developed for warehousing and supply chain into the store environment.

Grocery chains have moved in this direction, with online ordering where customers can pull up to a designated spot and have product loaded into their cars. There are bumps that need to be worked out, however.

"You end up moving that pick process used in the distribution center for years," Hendrickson says, "but you're doing it less efficiently than the warehouses learned to do."

Honeywell has launched a line of products it calls Connected Retail, designed to bring voice-directed picking into the store. The goal is to use technology



## Internet of Things in Retail: Already at Work

Here's a look at what's here — and what's coming:

- Several retailers including Neiman Marcus have experimented with “magic” or “smart” mirrors. These devices allow customers to envision products in a different color or see how an outfit looks from the back. Some also allow social media interaction.
- Amazon made a splash with its cashier-less grocery store test late last year. It senses when items have been taken off the shelves and then leave the store; the customer's Amazon account is charged soon after. Amazon has been quiet about the technology behind it, only to say that it uses sensors.
- Intel debuted many IoT applications during NRF's annual convention and expo in January. One integrated operational systems to maximize energy savings; another, a pilot with JDA and Theatro, uses sensor technology to provide information to employees about where consumers are in the store.
- In Europe, delivery firm DHL and automaker Daimler have teamed up for a test that incorporates package delivery to the trunks of parked cars.
- Walmart and Panasonic are testing smart shopping carts. Walmart, along with tech company Five Elements, uses the carts to help customers match their shopping lists with store inventory. Panasonic, meanwhile, offers a cart that identifies the items in the cart, tallies the bill and drops the items into a bag.

to predict how long order fulfillment takes and improve inventory accuracy and buy online, pay in-store order fulfillment.

“There are upstream and downstream effects that you need to be able to have to make that happen,” Hendrickson says. “That is the advantage that traditional retailers have that e-tailers don't have and can't get quickly. My local grocery store can deliver something faster than UPS ever will be able to, drones or no drones.”

RFID plays a key role in order fulfillment and in providing information to customers. But it still has a way to go, says Andrew Hopkins, managing director at Accenture, who leads the company's work related to IoT for retail.

“Intel has been doing work on tracking items anywhere in the store to eliminate the confusion of misplaced merchandise. If it is on Rack A as opposed to Rack B, unless I have full coverage of the store, I don't know that,” Hopkins says.

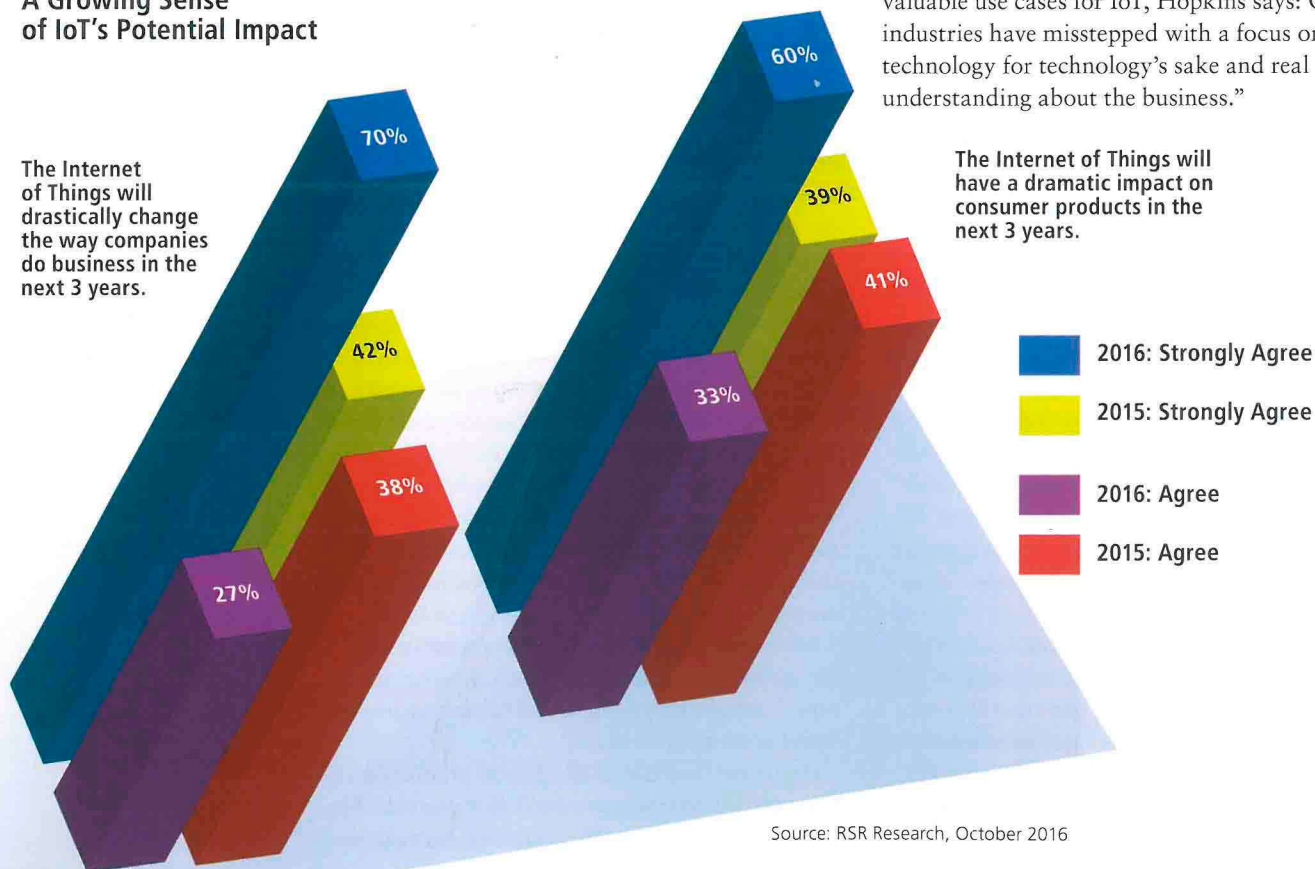
“I know it's somewhere in the store. If I can get to rack level or shelf level, you've gone another step in the ability to minimize stockouts. That's closer to an endgame of RFID in the store.”

### ENABLING TOUCHPOINTS

Retail is ahead of other sectors in determining valuable use cases for IoT, Hopkins says: Other industries have misstepped with a focus on “the technology for technology's sake and real lack of understanding about the business.”

### A Growing Sense of IoT's Potential Impact

The Internet of Things will drastically change the way companies do business in the next 3 years.



Source: RSR Research, October 2016



“The value comes from enabling new touchpoints, and enriching relationships through prescriptive engagement. Sensors improve transparency to goods in motion,” Hand says. “But connecting that information to where the customer is in their shopping journey informs engagement, relationships/loyalty and conversion rates.

“Do [I] know that a shopper ... in a physical store was online last night, and do I know what sort of engagement strategies resonate with the customer? In context where they are in their customer journey, can I interact and engage them and bring them to the finish line in that purchase?”

That may not be in the immediate future, but it showcases the potential that IoT holds.

For now, much of that focus is on “transparency to inventory,” Hand says. Don’t dismiss that as ignoring customer experience.

“One of the challenges of buy anywhere, fulfill anywhere omnichannel models has been in being sure that the commitment you make to the consumer online can be fulfilled. Retail inventories have never been exactly right and retailers didn’t worry about it too much. They figured everything came out in the wash. That just isn’t good enough anymore.”

## SMART STORES

Inventory tracking is not the only back-office function being overtaken by Internet-enabled devices. Kozup points to managing systems like HVAC and lighting as another area in which retail is embracing IoT technology.

“That signals to me that the mentality is focused on older technology,” he says, “and has not yet identified how sensors, how the integration of lighting controls, temperature gauges, can start to impact the store environment or help with remote control or remote maintenance. There’s some telling data in that.”

Mitchell also sees retailers adopting energy savings initiatives through IoT. “Any new lighting going into stores now is smart lighting,” he says. “It will pay for itself with savings out of the gate. It’s an easy investment for the retailer, and it represents the start of building an in-store sensor platform for us to do much smarter things.”

The “connected store” is not that far off, he believes.

“Right now, pretty much what we know about what’s happening in the store [is] the front door opens, it closes, we divide the number of door openings by two and call that traffic analysis,” Mitchell says.

“By having a sensor capability in the store to track Bluetooth, RF and cellular signals as people

move through the store, we can see the true demand or shopping intent. What’s the path? How many people came in and left without purchase? Right now, we have no idea why.”

In some ways, this will give retailers the same sort of insights they gain from e-commerce. With the Internet, retailers track when shoppers return and gain “powerful signals about your intent to purchase,” Mitchell says. “Having the ability to sense inside the store, from an omnichannel analytics perspective, is going to let us blend those two things together, get a much more accurate picture of that omnichannel demand around that physical store or in the home.”

The technology is in place, but questions remain about when they’ll start mining the data, Mitchell says. “They’ll want to recoup their investment from the energy savings first, but you’ll see right on the heels of that, they’ll start to leverage the data that’s coming off the in-store sensor arrays. Innovation will vary depending upon the retail segment and their ability to interpret and understand this data. That will set the pace.”

## MERGING WITH BIG DATA

While improved inventory accuracy is needed to improve the omnichannel experience, IoT offers more potential for other aspects. Aruba’s research showed that location-based services were the top area of focus for retailers.

“In-store location services are a means to personalize the shopper experience,” Kozup says. “I understand where you are in the store and have the means to access you through the mobile device and potentially a loyalty program. That allows me to deliver content and relevant information to you, but ultimately in the eyes of the retailer to bridge the digital with the physical environment.”

The potential for all of this to merge into one massive data-generating operation is limitless. Kozup says one of Aruba’s clients had a well-developed loyalty program in the digital domain through a newsletter.

“They could track people as they came to the website,” he says. “But it wasn’t until they came into the store environment that they were able to match — through the bridge of the mobile app — exactly where they came into the store and pair that back to the rich data in the digital domain.”

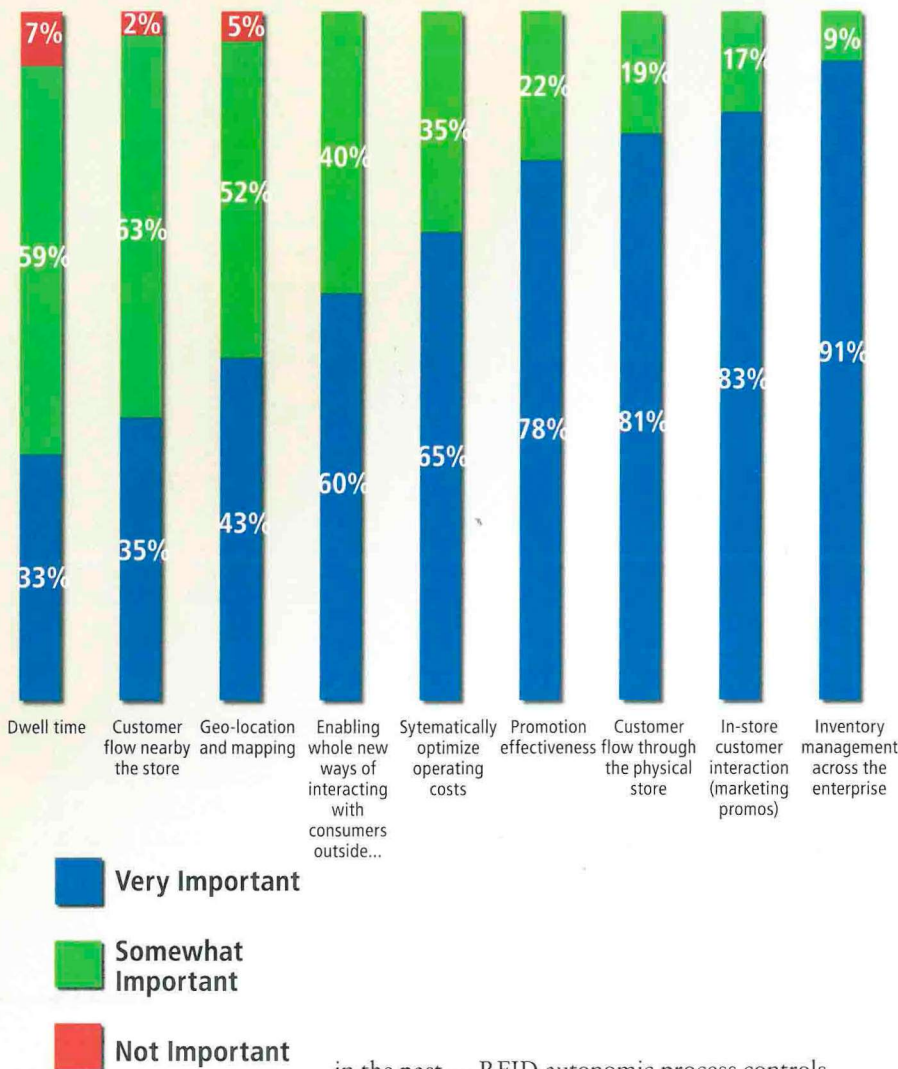
That is the next revolution of retail’s digital transformation, Hand says. “The key mission for retail is to blend the digital and physical to help consumers make purchases in the stream of life. There are technologies, IoT technologies on the supply side, that we’ve seen and heard a lot about

Omnichannel is driving changes in stores — every store is essentially a distribution center. “One of the challenges of buy anywhere, fulfill anywhere omnichannel models has been in being sure that the commitment you make to the consumer online can be fulfilled. Retail inventories have never been exactly right and retailers didn’t worry about it too much. That just isn’t good enough anymore.”

— Leslie Hand, IDC Retail Insights



As relates to IoT, how would you rate the importance of these capabilities in retail?



Source: RSR Research, October 2016

in the past — RFID autonomic process controls and robotics and that sort of thing — that improve the efficiency with which you fulfill goods.”

When it comes to understanding the data that today’s technology generates, there is a significant cost, Rowen says. “Retailers understand that the cost doesn’t stop there. They’ll also need the manpower to make any sense of it.”

**PROVING INVESTMENT WORTH**

“Smart” dressing rooms are perhaps one of the most-recognized use cases for IoT in retail; they’re being recognized as more than a cool tech-enabled capability. “Digital fitting rooms have a lot of traction right now as a part of an engaging experience,” Hand says.

“The value to the consumer is three-fold: One, knowing me, what I need and helping me in context on the spot. Two, it’s being a trusted, valued supplier

of goods that I’m going to go to first because you always meet your promise to me. And three, it’s about an incomparable experience that strengthens relationships.”

Yet Rowen believes the smart dressing room is the most overhyped use of IoT. “I’m certain a lot of people will disagree because of several high-profile examples in luxury and fashion, but is this really the most pressing problem facing most stores right now? I don’t think so. There’s a lot more basic things most brands need to work on to make the whole of the store more interesting.”

Hopkins notes that technology is there, but the price level — and proven business case — may not be. “Those are the more interesting technologies on the experience side that are not necessarily thought-through and will take longer. Automatic checkout, as an example, sounds really cool but that’s a stretch because of the level of transformational change to your customer, associate and store. It’s not the matter of a technology, but more of, ‘Is it a priority and do I understand the benefit?’”

Not every solution will be worth the investment. “This idea of being able to walk out of a grocery store without having to check out is quite compelling,” he says. “It’s less so to a degree if I have half a dozen items of clothing.”

While some are heralding 2017 as the year of IoT, one thing is clear: Change is needed.

“If your stores end 2017 the way they started as far as experience, you’ve done yourself a real injustice,” Rowen says. “There is less and less reason to visit stores. But some social part of us does want to go out. I don’t know if 2017 is the year that IoT goes from hype to reality. But it has to be the year that retailers start thinking about how technology makes their stores more interesting.”

One thing is certain: Those who like to innovate are experimenting, and many are ramping up deployments.

“I like to tell retailers that Amazon isn’t your biggest competitor,” Hand says. “But this announcement around the checkout-less store is a wake-up call about what’s already here. If you don’t start figuring it out, Amazon and other disruptors will do it instead of you. You need to get in front of that and transform the ease and convenience by which the customer is served.” **STORES**

**Sandy Smith grew up working in her family’s grocery store, where the only handheld was a pricemarker with labels.**