curb your enthusiasm

interview with Kevin Ashton

Not so long ago, RFID promoter Kevin Ashton's biggest challenge was making believers out of the skeptics. But today even he's a bit bewildered by all the enthusiasm. Yes, RFID will revolutionize supply chain management, he says; just don't expect it to happen overnight.

KEVIN ASHTON MAY NOT HAVE BEEN THE FIRST TO DEAL WITH THE "lipstick problem," but it's looking more and more like he'll be the one who finally solves it. The lipstick problem in question has nothing to do with stained laundry or keeping it from wearing off too quickly; it's the question of how to keep a hot-selling lipstick shade in stock all of the time.

Ashton's first job out of school was working as an assistant brand manager for Procter & Gamble in Europe. The marketing part of the job came easily too him—perhaps too easily. It quickly became clear that his biggest problem wasn't building brand awareness but keeping a hot-seller like Oil of Olay's Hazelnut lipstick in stock. To Ashton, nothing was more frustrating than learning after the fact that one of "his" brands had unexpectedly sold out in a couple of hours but wasn't replenished until the next week's scheduled delivery. There had to be a better way, he thought—a way of notifying the supplier that a shopper had just scooped up the last tube, a way of making sure store employees immediately restocked the shelves with more Hazelnut—not, say, Mocha Frost or Passionflower Pink.

Ashton's search for a solution took him deep into the murky world of radio-frequency identification, or RFID. RFID had been around a while, of course, but at the time it was largely used for applications like highway toll collection. Convinced it could solve logistics problems as well, Ashton started badgering his employer for research funding. After being passed up the line from manager to manager, he eventually convinced senior management that there was something to his idea and that it would be worth their while to collaborate with the Massachusetts Institute of Technology (MIT) to look into possible supply chain applications for RFID. The result was the founding of the Auto ID Center, with Ashton (only four years out of school at the time) as executive director.

Under Ashton's leadership, the Auto ID Center blossomed into a global organization

with laboratories at six major universities around the world and more than 100 corporate sponsors, including Wal-Mart, Target, Coke and Gillette. To oversimplify a bit, its mission was to find low-cost ways to use RFID technology to track merchandise as it moved through the supply chain. And that it did. In fact, by 2003, its mission was accomplished, and on Halloween, the Auto ID Center handed off its responsibilities to a new global standards organization, EPC Global, and passed into history.

Where did that leave Ashton? P&G would have gladly taken him back, but Ashton had been bitten by the RFID bug. Within two months, he had moved on to become vice president of marketing for a young technology company, ThingMagic, which invented the agile RFID reader. He remains there today.

DC Velocity Editorial Director Mitch Mac Donald recently caught up with Ashton to talk about what he's learned about RFID and logistics, the story the consultants keep missing, and why the conversion to RFID will take longer than we're being led to believe.

Q How did you get interested in RFID?

A My first job upon graduating from the University of London in 1995 was working as an assistant brand manager for Procter & Gamble's health and beauty care business in Europe. I very quickly became frustrated with the difficulty we had keeping popular products on the store shelf, so I launched a study to find the root cause of that problem. What we concluded was that it was an information problem—an information outage, if you will. We had good macro-level information about our supply chain, but when it came to finding out whether a specific product—say, a hot-selling lipstick—was on a particular store's shelf, the only way to find out was to send somebody out to have a look, which was obviously impractical and too expensive to do on any large scale.

Q Was it intended to be an RFID-focused test project?

A Not at all. Actually, I more or less stumbled across RFID, which at the time was being used primarily for access control applications—things like parking lots and toll roads. I realized that if we could put RFID in all of our products, we could potentially solve our supply chain information problem and for the first time, have 100-percent visibility of everything everywhere all the time.

Initially, the idea met with a great deal of skepticism—it was too expensive, the technology's performance wasn't good enough, and it would be impossible to get every single enterprise in the supply chain to adopt a single common system. In order to solve those problems, I recommended to P&G that they start a research consortium at MIT that would be devoted to solving the technical and price problems. By using a consortium model for funding, you could bring supply chain partners together in a neutral environment where you'd stand a better chance of building a consensus about a single system for supply chain RFID. We started that program in 1999. It was called the Auto ID Center.

As we were setting up the Auto ID Center, MIT asked me to become the center's executive director. We worked out a deal whereby P&G essentially loaned me to MIT for four years. Though I stayed on the P&G payroll, which represented an additional P&G contribution to the center's work, I moved from the U.K. to Boston to work at the Auto ID Center. That was in September 1999, and I've been in Boston ever since.

Q How did you build up the Auto ID Center?

A We started with just three founding sponsors, although a lot of companies now claim to be founding sponsors—including some I've never heard of. The true founding sponsors were Procter & Gamble, Gillette and the Uniform Code Council.

Our first order of business was to get more sponsors so we could build the resources to do serious research. For the first four to six months, we basically served as evangelists, spreading the word and trying to get other businesses interested in funding this dream. It wasn't as easy as it first appeared. Even though we had P&G, Gillette, the UCC and MIT on board, there was still a little skepticism. But in early 2000, our recruitment efforts began to pay off: International Paper joined, Phillip Morris joined, and CHEP, the pallet-leasing company, joined.

Q Did those early joiners help bring in others? Generally, nothing attracts a crowd like a crowd.

A Yes, we found that sponsors brought more sponsors. Everyone wanted the project to succeed. They believed in it. They wanted other people to come to the Auto ID Center party, so it became increasingly easy to attract sponsors during the last part of the project.

The turning point came a couple of years into the project. First, as more and more big names joined the effort, it began to feel riskier not to get involved than to get involved. Second, we built a lot of credibility because we were able to fulfill our promises to our sponsors on a regular basis. We'd say 'We think it's possible to do "X,"' and then four months later, we would deliver "X." It became harder and harder for skeptics to scoff at the notion that someday we'd see low-cost RFID everywhere. We just kept knocking down the obstacles. Eventually all those expert statements about what couldn't be done started to ring pretty hollow as we began to do the supposedly "undoable" things.

By 2001, we were ready to start full testing, which was something our sponsors really wanted to do. They wanted to get their technology into the field while it was still fresh

and wet—and while it was still easy to change. We learned a lot from the field trial, which began in October 2001 and continued until the project ended in 2003. At the same time, we were able to expand the program to five more universities, building centers at Cambridge University in the U.K.; Keio University in Tokyo; Adelaide in Australia; Shanghai in China; and Zurich, Switzerland. That gave us world-class research capabilities in a number of different dimensions.

By 2002, it was clear that the technology was going to work. But that raised a whole new set of problems. The companies sponsoring the program were impatient to start using it, but MIT was not interested in administering a commercial standard once the technology was being used in the marketplace, and we needed an entity to administer it. The solution to our problem turned out to be the Uniform Code Council (UCC) and EAN International, the non-profit organizations that were already administering bar codes on a global basis. We worked with them to create a new nonprofit entity, EPC Global, that would be a wholly owned subsidiary of those two organizations. On Oct. 31, 2003, we formally handed off the commercial standard administration aspects of the Auto ID Center to EPC Global (though we retained research capability at the six universities in the form of what are now called Auto ID labs), and the Auto ID Center came to a very successful conclusion.

Q You certainly had a lot of exposure in the RFID world during your tenure with the Auto ID Center. With all the opportunities I'm sure you had before you, what prompted you to join ThingMagic?

A I had decided that I would stay in the RFID space rather than go back to P&G, which is something that P&G understood and accommodated very graciously. Of the many opportunities that I had, the offer from ThingMagic, a small technology company, was by far the most enticing. It is possibly the only profitable RFID company in the world. It makes a profit every single day and has since day one. It has never taken any venture capital. It has an incredible technical team, a strong and growing management team, and I believe a market-leading product. I really saw ThingMagic as an innovation machine, much the same way the Auto ID Center was an innovation machine. That's what I had enjoyed most about working there. This was really the right place for me, and we've had a fantastic year.

Q Tell us a little about ThingMagic.

A ThingMagic was founded in 2000 by five MIT Ph.D.s, all from the institute's media lab, who wanted to create technology for the next age of computing. They started out doing consulting work with a number of blue-chip companies, creating prototypes of various devices that worked with sensors and RFID systems.

One of those early clients was the Auto ID Center, which had found it needed a new kind of RFID reader. Nobody in the RFID industry knew how to do it, so in 2001, we engaged ThingMagic on a consulting basis to develop a reference design of what we called an "agile RFID reader." What we were asking for seemed nearly impossible: an RFID reader that could read any kind of RFID tag, on any kind of radio frequency; that also worked as an "enterprise network" device, meaning you could connect hundreds and hundreds of them on your network and they'd work together without any problems. Furthermore, the readers would have to deliver all this high-end capability for a very, very low cost. As with most things at the Auto ID Center, particularly in the early years, there was a great deal of skepticism from experts about what we were trying to do.

Q Skepticism from the Auto ID Center's staff, or do you mean external folks?

A Externally. Expert is a relative term. I define "experts" as people who should know better.

Q I'm saving that for future reference!

A Though many predicted that at worst, the project would fail and at best, we'd have to scale back on our requirements, we never lost faith in the young design team. Sure enough, six months later ThingMagic showed up at an Auto ID Center sponsors meeting with a working prototype of an agile low-cost, network-ready RFID reader called the Mercury1.

When it came time to field test the reader, we gave ThingMagic an additional contract to produce a few hundred of an improved version, the Mercury2. The testing took place in the sponsors' own distribution centers and stores, and once they had tried out the RFID reader, they wanted to buy it for themselves. ThingMagic then licensed the manufacturing rights for the next-generation reader, the Mercury3, to one of Tyco Co.'s subsidiaries, ADT Sensormatic. That third-generation reader emerged in 2003 and has driven a lot of the EPC [electronic product code] pilot tests around the world. Then in the summer of 2004, ThingMagic launched its fourth-generation agile RFID reader, Mercury4, which is based around an Intel process. Mercury4 has done incredibly well in the marketplace. We have just launched two additional Mercury4 products called Mercury 4E and Mercury 4H, which are targeting the "embedded printer" market, the label printers that have RFID capabilities.

Q Are the Mercury readers named for the NASA missions?

A Yes, they are. When the guys were designing the first reader for the RFID center, there was widespread skepticism that they could meet all the requirements. They

looked to NASA's Mercury program for their inspiration, so they called their first reader Mercury1.

Q In the 15 years I've spent covering the logistics/supply chain space, I don't think I've ever seen anything that has created the buzz that RFID has. Why is that? Is it the marketing? Is this going to be anywhere near as big as the hype suggests?

A It is, but it's going to take a lot longer than most people expect. In the last five years, public perception of RFID has somehow swung from unjustified skepticism to unjustified optimism. It's true that in the long term, RFID has the potential to revolutionize supply chain management. It's also true that those people who figure out exactly how to exploit the technology will realize pretty radical benefits in the short term. Nonetheless, the full infrastructure build and the full impact of this technology is going to take maybe five or 10 years.

Expecting RFID to change the world tomorrow is a bit like expecting your newborn child to go to MIT. Yes, your newborn child might well be capable of going to MIT and becoming president of the United States someday, but it doesn't happen on day one. It takes time to do some of the things we're trying to do and to build a mature vendor base so it can supply these very large companies that are driving our RFID adoption. I believe the benefits will eventually exceed all expectations, but it's going to take a little time.

Q Do you think your evangelism in the Auto ID Center's early days might be partly responsible for these unrealistic expectations?

A No, I don't think so. I think the problem is getting people to hear the whole message. This is a complex technology and this is a complex world. You can't pack the full story into a single sentence or a single headline. That's the first thing.

The second thing is we're in a technology vacuum at the moment. Outside of RFID, there are no other exciting technologies out there that appear to offer much of a money-making opportunity. That's created a market where there are lots of one-eyed men trying to sell guide services to the blind. For years, skepticism about RFID kept most companies and most executives from bothering to learn about it. Then they suddenly woke up one morning and sniffed an opportunity, and they become RFID experts overnight.

I think most of the unrealistic expectations can be traced to these people who came late to the game but with great enthusiasm. We welcome their enthusiasm, but they haven't fully grasped the complexity of what we're trying to do. One of the words most commonly associated with RFID is "hype." Well, hype is an abbreviation for hyperbole, which is another way of saying exaggeration. What's being exaggerated isn't RFID's potential to revolutionize the supply chain; that seems inevitable. It's how quickly you can get to the upside. This is a step-by-step deployment. The companies that are managing the technology well are looking for value at every step. They will find it. But anybody who expects a supply chain revolution tomorrow is underestimating the scale and complexity of the supply chain.

Q Let's say you're the chief logistics officer for a *Fortune* 1000 global company. What should you be doing today with RFID? Should you be watching and waiting? Should you be pushing forward with the implementation?

A I think you absolutely have to be doing, not watching. There are too many people out there hawking spiral-bound documents about RFID and too few people rolling up their sleeves and trying to make it work. The way to learn is to do.

My advice to that chief logistics officer is to budget some money, find a really easy opportunity in your supply chain, figure out how RFID can help you there, and then do it. By "easy opportunity," I mean a clear problem—a laborious and costly task that could potentially be replaced by RFID—and try it out on a small scale using products that are reasonably compatible with RFID (that is, not metals or liquids). You start there. You take that first baby step. Every time you fall down, you get up and try again. It may not seem that way at the time, but each failure is incredibly valuable. First of all, it takes you closer to your goal. Second, you can apply everything you learn to the next step and the step after that and so on. That's the way to do it.

You don't want to be one of those guys who's determined to wait until it works on krypton at a range of three miles 100 percent of the time. People set a terribly high bar for new technology, but that's unreasonable if you think about it. Take the cell phone, for example. Once in a while cell phones cut out or need to be recharged or simply won't work in a certain area, yet we still find them very valuable. I've never seen the wisdom of waiting until a new technology's perfected before allowing it into your environment. It isn't going to be perfect.

All the same, too many people still focus on the limitations, not the opportunities. I see it again and again and again. It doesn't help that the consultant community is out there issuing report after report indicating that nobody has figured out RFID and that no one should expect a return on their investment (ROI) anytime soon. As far as I can tell, most of what these analysts do is not actual research, but a kind of journalism. They phone a bunch of people. The ones who talk to them get quoted. The ones who don't, don't. Then they claim they've done some analysis.

It's simply not true, for example, that nobody has figured out the ROI. It's just that the people who have figured out the ROI aren't talking about it. Why would they?

Q You know for a fact that there are companies out there that have figured this out?

A Oh God, yes. There are major users who expect to get a return on their investment within six months. But they're not going to tell anybody how because they consider that a trade secret.

I think that the right thing for your hypothetical logistics manager is to have faith that this is going to work, to learn by doing, to make sure everything he or she does is scalable, to learn from the mistakes and the failures, and not to attempt to do the hardest things first. That's the approach that I've seen work again and again.

Q Sounds logical. It's like a non-swimmer who hopes to swim across the English Channel in five years. It would behoove him or her to get into the pool and learn how to swim right now, wouldn't it?

A Absolutely, and to try to swim 10 feet in warm water. It's the same thing if you want to learn to play baseball: you have to go out and try it. You don't read a bunch of baseball books and then try to bat in the World Series.

The other thing to keep in mind is that success is always, always fueled by hope. Innovation is the triumph of hope over doubt. If you let the doubters into your RFID program, you will almost certainly fail. You need hopers.

Q Let's go back to the hypothetical chief logistics officer for a moment. Say that executive takes a Rip Van Winkle-type snooze and when he or she wakes up, it's 2019. What will be different about the logistics operation as a result of RFID?

A Almost everything, I think. It's very difficult to predict at the application level that far out—15 years from now. Applications beget applications. You start thinking about things in a new light.

Still, here's what I'd expect to see: In 2019, pretty much every single item in the supply chain has some form of RFID technology integrated right into it. Almost every square foot of supply chain real estate is outfitted with RFID readers or something like them. Where appropriate, sensory data on, say, temperature or pressure are streaming from that system. That information is gathered in real time in a very easy to use, accessible way so the chief logistics officer can glance at something that maybe looks a bit like a Blackberry and see exactly how many items of a particular SKU are on hand. Distribution centers will be true distribution centers and not warehouses by another name, meaning that typically things will head back out almost the moment they arrive. Many of these distribution centers will be unlit because they'll be using robotic systems, not people, to move things around and handle tasks like packing and unpacking.

As for the distribution centers or warehouses that are used for storage, you'll find that storage will be much more random in arrangement than it is today. That's because if you have full automation you know where everything is all the time, and a random warehouse configuration is much more efficient than one where items are stored in alphabetical order, for example. I think supply chain management will be much more of a science and much less of an art by 2019. Workers will find it inconceivable that anybody ever managed without automatic identification and sensor networks and real-time information on everything that is moving around.

Q Just the way I once was able to pick up a pencil and pad of paper and do math, but now that I've had a calculator for so long, I've forgotten how.

A Indeed. As another example, how did we do business without e-mail? I deal a lot with people who are skeptical about how far RFID can go. I have to remind them that 10 years ago, almost nobody had an e-mail address or a cell phone. Today, everyone walks around with handsets glued to their ears. What's interesting is not just how different things are, but also how hard it is to remember what has changed. The truly revolutionary, radical changes happen much more slowly than people expect; they take a decade or two. There isn't this blinding flash of light on the road to Damascus. □