New EPC Standard For Information Services May Breathe Life Back Into RFID Market

By Jean V. Murphy

While analysts put a positive spin on the current slowdown in the RFID market, a new EPCglobal standard for using RFID data could provide a much needed boost.

RFID supply chain implementations that go beyond “slap and ship” compliance appear to have slowed to a crawl. Beneath the surface, however, there still is plenty of activity around this emerging technology, and most analysts see the slowdown as a natural stage in the adoption curve or even as a positive sign.

ABI Research, Oyster Bay, N.Y., revised down its forecasts for the RFID software and services market in 2007, for example, dropping its projection 15 percent to $13.1bn. Far from taking a bearish position on the RFID market, however, ABI says the trends driving this slowdown are positive signs of market maturation. “End users are taking a more managed approach to budgeting and integrating RFID solutions internally,” says Michael Liard, ABI’s RFID practice leader.

Similarly, Aberdeen Group, Boston, notes that retailers are realizing that “compliance is not a useful point of entry into RFID.” As a result, retailers’ deployment decisions are being driven by other objectives, such as improved visibility and customer service, which makes the adoption path more complex. “Retailers must consider the overall value proposition and make solution selections that not only satisfy the immediate objective (compliance), but also support long-term goals and opportunities,” says Aberdeen in its *RFID in Retail Benchmark Report*. “This presents a problem for most retail CTOs [chief technology officers], who cannot look to Wal-Mart for a relevant road map, yet must figure out which solutions play into a long-term strategy and which do not.”

Vendors who work with Wal-Mart suppliers see the same trend. “We see our customers trying to strategically figure out what phases two and three will look like,” says Dwaine Farley, CEO of Domino Integrated Solutions, Frisco, Texas, which specializes in providing retail suppliers a quick path to RFID compliance as well as ways to get a return on their investment. “Our customers are looking out 24 months to try and understand how volumes of currently tagged products will increase and what SKUs will be added. They want to have visibility to the infrastructure they will need so they can get the money budgeted.”

One major deterrent in this market has been a lack of packaged solutions able to take raw RFID reads and turn them into useful information that can be shared with partners and used to better manage internal operations. Resolution of that crucial problem got a big boost last month when EPCglobal, the standards organization responsible for driving global adoption of the Electronic Product Code (EPC) used in RFID, ratified the EPC Information Services

(EPCIS) specification. This critical standard, long in the works, gives businesses a template for capturing and sharing information collected by RFID chips.

"You can capture RFID tag data all day long, but if everyone is using a different structure you can't share it or act on it," says Bryan Tracey, vice president of engineering and chief architect for GlobeRanger, Richardson, Texas, provider of the iMotion platform for "edge" applications. Tracey also is co-chair of EPCglobal's Software Action Group, which helped develop the EPCIS standard. "All of these really cool applications that everybody has been talking about for the past five or six years all require the sharing of RFID observations between trading partners in the supply chain, and that has been impossible to date because there was no standard," Tracey says.

Chris Adcock, president of EPCglobal, says the EPCIS ratification potentially will be more important to RFID than the 2004 release of the Gen2 air protocol standard, seen as the most important RFID standard to date because it led to much higher performing tags and readers.

Tracey agrees with this assessment. "EPCIS represents a true tipping point for the evolving, RFID-enabled marketplace, and especially for our global customers, whatever their line of business," he says. "It's no longer just about sharing events; it's about all industries agreeing on what the events are and what they look like. This will forever change the way all business systems think about and apply EPC-oriented data."

Tracey further explains the importance of EPCIS this way: "If I were a manufacturer or a distributor or a retailer and I saw a bunch of tags moving through a dock door because a shipment was being received or an order was going out, or if I were putting a bunch of items into a case or cases onto a pallet and I created an observation that these specific cases were being aggregated, there was no industry standard for describing those events," he says. "With no standard way to share or query this information, companies were not able to use it in any effective way."

With the EPCIS standard, says Tracey, users will be able to take observations, put them into business context and turn them into events, so they can mange by exception. Also, with standard query capability, information can be shared among partners and used by any number of enterprise applications.

"The fact that a reader saw a tag is, by itself, not very interesting," Tracy continues. "But if I can tell you why the reader saw the tag and where the tag is now and the state of the product that tag is associated with, that is incredible information that would be extremely useful for a warehouse management system or an enterprise resource planning system or many other applications."

In its simplest form, EPCIS is an XML-based structure made up of four tag-reading events: object, quantity, aggregation and transaction. By combining these standardized events with other enterprise data, companies can create meaningful business information. For example, a raw tag read typically will report that a specific tag number was seen at a specific reader at a specific time. EPCIS enables higher-levels of information, such as a case of product X was moved at 12:15 p.m. from the back room to the retail floor of store Y and is now available for sale.

It is not just vendors who are excited about the standard. Leading CPG manufacturers, including Procter & Gamble, Unilever and Kimberly-Clark, also have praised its ratification. "Even though manufacturers have been putting tags on goods and retailers have been receiving those tagged goods, the question has been, what is the value?" Dick Cantwell, P&G vice president and head of its RFID efforts, said in an interview with *RFID Journal*. "What EPCIS does is connect data sharing and communications in a way that benefits both the manufacturers and the retailers. They both can maximize the value they get from RFID information. It is no longer a closed-loop solution."

Tracey predicts that a variety of vendors, including GlobeRanger, will start developing solutions to enable the transformation of tag reads into EPCIS events. There also will likely be a market for third-parties to host repositories of EPCIS data.

"We think there may be a concept in which these events are distributed over multiple tiers of the supply chain with each tier essentially creating its own point of view," says Dave Bennett, chief technical officer at Axway, a business communications hub headquartered in Scottsdale, Ariz. "These points of view will essentially consist of complex event processing and analytics that tie these sensor observations into real business events and processes that people will want to register to, depending on their business interest or need."

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Some leaders already have products that leverage EPCIS. IBM, Armonk, N.Y., and BEA, San Jose, Calif., for example, each have introduced middleware based on the EPCIS specification.

IBM's WebSphere RFID Premises Server, middleware that aggregates and filters RFID tag data and other sensor information, is complemented by the WebSphere RFID Information Center, a high performance EPCIS repository that stores, manages and enables sharing of RFID data within the four walls and with trading partners.

"At IBM, what we have found is that the biggest pain point with RFID is not around reliably capturing data—we can

do that now—but more around what to do with the data that has been captured,” says Kathe Baxter, product manager in IBM’s software group. “The issue is how to take this captured data and combine it with other information available in the enterprise to make useful information that will provide new insights. This is an absolute requirement for innovation.”

In addition, being able to query and share this information will allow greater automation of a range of business processes. These include shipment verification or confirmation of receipt, diversion tracking, inventory management, targeted recalls and regulatory compliance.

Deployments

The IBM solution already has been successfully deployed for a number of early adopter clients, including Unilever, the e-customs project ITAIDE in Europe and “big three” pharmaceutical distributor AmerisourceBergen.

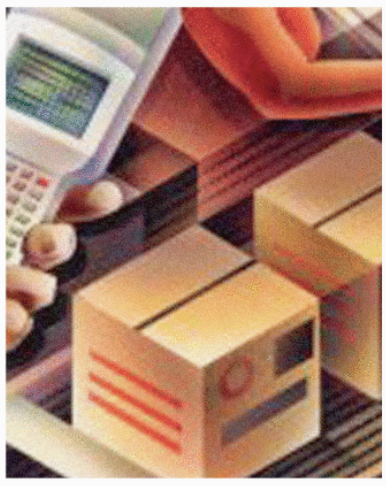
The latter’s implementation will use IBM’s RFID middleware and embedded software on readers as well as the RFID Information Center. Drugs that currently are being individually tagged by certain pharmaceutical manufacturers will be read as they enter the AmerisourceBergen DC. Systems will monitor these products through picking and packing and will record the time and location each unit is shipped out as well as its intended destination, giving a complete record of the history of all RFID tagged drugs.

“The advantage of using the RFID and EPICS system is that the information regarding the product’s journey through the supply chain is stored in a manner that is useful for a number of different applications,” says Shay Reid, vice president for integrated solutions at AmerisourceBergen, Chesterbrook, Pa. “Once the RFID tags have been read and the data has entered the EPCIS, the system can be queried to build a product pedigree for customers on demand, to provide real-time receiving and shipping information to manufacturers as well as to more closely track both inventory and product demand.”

In another pharma application, drug maker Novartis, Basel, Switzerland, is working with ERP giant SAP on an end-to-end RFID-based tracking solution. It will use SAP’s recently announced EPCIS-compliant data repository as a central element. The aim is to track each tagged bottle, display carton, shipping case and delivery pallet in real time, verifying the authenticity of products as they travel through the supply chain.

“In addition to helping meet regulatory requirements, this SAP solution will enable seamless integration into our SAP ERP system and access to existing transactional information,” says Marc Bechet, head of IT for global technical operations at Novartis.

As with IBM’s RFID Information Center, SAP’s Product Tracking and Authentication (PTA) solution is intended to enable companies to combine serialized EPC data with data from enterprise resource planning and other business applications to enable meaningful business information.



The pharmaceutical supply chain has taken the lead in RFID tracking because of the problem with counterfeit drugs and requirements by California and Florida for an electronic pedigree that can verify a drug’s authenticity. SupplyScape, Woburn, Mass., is a vendor specializing in securing the drug supply chain. It is the technology partner in perhaps the largest deployment to date of RFID—Pfizer’s initiative to tag all bottles of Viagra sold in the U.S.

“Pfizer tags each bottle and registers them with us,” says Peter Spellman, vice president of SupplyScape. “As the bottles go through the supply chain, we provide assurances of the authenticity of each serial number. So prior to dispensing the product, a pharmacist can scan the tag and our online service will tell them whether or not it is legitimate.”

Another scenario has wholesalers doing mass authentications when cases and pallets pass through a dock door or other reader portal. “Using this method, we can do about 10,000 authentications a second,” Spellman says. The company also had to come up with a way to manage the sheer volume of data that results from item-level serialization and tracking. “We knew that having a database record for every bottle would create an explosion of information, so some time ago we built something we call semantic reduction,” he says. “For our e-pedigree system, we use this to greatly compress these forms.”

Close to the Source

Sheer volume clearly is a data management issue with item-level tracking, especially in an area like pharmaceuticals where regulations require that information be kept for a specified period of time. In other areas of the supply chain, however, worries about data volume are a case of “the sky never falling,” says Chris Kelly, director of RFID business development at Intermec, Everett, Wash. “All RFID vendors were building business plans around networks and architecture and systems to manage all the data that was expected, but that has turned out to be a non-problem, at least from the perspective of Intermec,” he says. The way the market has evolved, a lot of “edge processing” is actually happening inside of intelligent readers like Intermec’s IF5 or IF61, he explains. “So an awful lot of read transactions are dealt with inside the device itself and only relatively small packets of data are actually communicated up to other systems. The amounts of data are not overwhelming.”

Digesting data close to the source, at the edge of the enterprise, is the first principle of effective RFID data management, says Mark Palmer, vice president of event stream processing at Progress Software, Bedford, Mass., which provides various solutions for managing RFID data, including its OpenEdge application platform. Processing at the source includes more than basic filtering, he notes. “It’s data cleansing, consolidation and summarization” and can include intelligent compensation for missed reads.

Progress is the technology partner in a groundbreaking item-level RFID implementation at BGN, a large bookseller in Holland. Books are individually tagged at the book distributor that provides 80 percent or more of BGN’s stock. As books are boxed and prepared for shipping, advance ship notices are

automatically generated to BGN stores. When shipments arrive at the store, boxes pass through an RFID tunnel. The collected data is sent to another Progress application that correlates the books received with the ASN and updates store inventory. In addition, in-store customer kiosks use a Progress application called EasyAsk that lets customers query the stores inventory to find the books they seek. Since location is determined by store shelves that have their own RFID tag, the system is able to tell customers exactly where to find a book, even if it has been misplaced.

“This is a great example of a modestly sized company getting really good ROI from using RFID technology today,” says Palmer.

Promotional Displays

In what could prove to be the first widely adopted packaged software for RFID in the supply chain, OATSystems, Dallas, has introduced Real-Time Promotion Execution, a solution to help consumer packaged goods (CPG) companies better execute planned promotions.

“This solution represents the use of RFID data to actually improve a business process dramatically,” says Paul Cataldo, OATSystems’ vice president of marketing. Better promotion execution is important, he says, “because industry statistics show that between 15 percent and 40 percent of stores fail to move displays to the sales floor on time. Our solution can improve that performance significantly.”

Kimberly-Clark tested the new solution at several stores in 2006 and has committed to rolling it out more widely in 2007 and to implementing the full OAT Foundation Suite. One of the key elements in the solution is a mobile tagging station from ADASA, Eugene, Ore., which allows Kimberly-Clark to easily equip its third-party contract manufacturers with the ability to tag the promotional displays. The ADASA mobile tagging station can be worn on a belt and can commission Gen2 EPC tags as needed. The “RFID in a box” solution also includes a laptop equipped with OAT software and a Motorola handheld device that reads RFID tags as well as barcodes. The third-party generates the tags and attaches them to the promotional displays. Both the product barcode and the RFID tag are scanned and permanently linked in the OAT software. When the display arrives at a store’s backroom it can be read or scanned and read again when it moves onto the selling floor. Kimberly-Clark and store management are alerted automatically whenever a promotional display is not deployed on time.

Early results indicate that Kimberly-Clark has increased promotions compliance among stores by 20 percent and that percentage is expected to further increase, says Cataldo. “This is an example of using RFID data to actually drive top-line sales so everybody wins.”

Promotions execution is one of those applications for RFID “that no one saw when we first started working on this,” says Bill Hardgrave, director of the RFID Research Center at the University of Arkansas, Fayetteville. “It’s an application that we were able to determine only when we started looking at the tag data itself. We were able to see that promotional products were not getting out to the sales floor. That is the type of insight companies are hoping to get from this data but ones of this magnitude are hard to find.”

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— *Paul Cataldo of OATSystems*

Asset Management

Asset management is another area where companies are making effective use of RFID data. “We are seeing a lot of interest in yard management applications of RFID,” says Jerry McNerney, senior director of transportation, distribution and logistics solutions at Motorola, Schaumburg, Ill. “You have these different companies that have tied RFID reads and dead-reckoning locating capabilities into their applications so, when they have all these trailers in a yard, they can quickly and accurately locate them, without having to send someone out to walk around and look for them.”

WhereNet, Santa Clara, Calif., is one company that provides such a real-time locating system. In these applications, “the value of the solution depends 100 percent on the quality of the data,” says Matt Armanino, executive vice president of worldwide field operations for WhereNet. The ROI drivers come down to how many transactions a user has to rework manually, he says. “That’s a fundamental question because unless you can convince the customer that the system has very high reliability, the value starts to erode very quickly. So we have had to sign up to very tough standards of reliability—99.9 percent of the time, the trailer or container has to be where we say it is.”

This is not an easy target to hit because in addition to active RFID, WhereNet also has layered location software. “When you add that extra layer of information, it makes the task far more complex. It really comes down to whether you have a system that can provide location coordinates in very dirty environments. It all ties back to quality of data.”

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