AMR Research Alert

High-Tech and RFID: They Want To Make It, But Will They Buy It?

Thursday, October 06, 2005

Bill Swanton

High-Tech and RFID: They Want To Make It, But Will They Buy It?

I spoke this week at a forum of high-tech companies discussing Radio Frequency Identification (RFID) technology and market adoption. The forum was organized by the International Electronics Manufacturing Initiative (iNEMI) and hosted by **Sun Microsystems**. It was an interesting group because most of the companies are both budding suppliers and potential consumers of RFID.

The Bottom Line: The Electronics industry faces the same cost/benefit issues that have slowed RFID adoption in Consumer Products, plus a few unique technical and market problems. This is counterbalanced by a desire to see RFID become a volume business.

Similar cost, but additional technology hurdles

Like other industries, High-Tech has successfully used permanent RFID tags for works in progress and asset tracking applications, though densely packed, metal-clad electronics equipment is a difficult RFID environment. For example, consider the following:

- One company had to place tags on thick plastic spacers so metal surfaces did not affect operation of the tag.
- Inch-thick rack-mounted equipment did not provide enough space for low cost tags and RF signals could not penetrate the narrow distances between rack-mounted units.
- Pallets of cartons containing equipment were difficult to read unless the over packaging created enough air space between each mass of electronics.

High-volume applications run into the same tag cost issues as other industries. One successful pilot tracked electronic components from manufacturing, through distribution centers, to the customer's manufacturing floor and generated valuable demand signals from actual consumption. The fact that each carton held tens of thousands of dollars of microprocessors made tag cost less of an issue.

A unique perspective on how to scale the industry

RFID is like many products that have passed through the Silicon Valley venue of the forum—it is waiting to "cross the chasm." Much discussion focused on the unsustainable integration costs for current projects. Several issues were identified that need to be resolved to get to a volume business, including:

- A volume application needs to be identified for the first bowling pin. It may not even be the general supply chain, but perhaps baggage handling or ePedigree for the Pharmaceutical industry.
- Standard antenna and equipment configurations are needed to reduce the engineering for each deployment. One pilot antenna set was literally built in a garage using RF antennas mounted on plumbing pipes and shielded with wire closet shelving purchased from a home center.
- A standard reference architecture is required, especially for data handling and networking. Squabbling between antenna, middleware, and communication vendors on where to put some functionality was noted. More important, some participants believed that to be successful in the average factory or warehouse, deployments needed to be self-configuring, resilient, and highly maintainable. The term "network appliance" summed up the concept. And don't forget security.
- The ultimate question was how data would be communicated up and down the supply chain. Any solution that required extensive RFID integration by each participant to its Enterprise Resource Planning (ERP) system and then custom e-commerce integration between each partner seems doomed for failure. I made the analogy to credit cards—I can use any of my credit cards in any business around the world and the transaction will be routed to the right processor for billing. This provoked a discussion of alternate methods for filtering and communicating data and even the possibility of providing RFID infrastructure and communication as a service.

Several participants drew parallels to the evolution of RF bar code terminals. Originally an expensive technology that required site surveys and specific engineering, over 20 years it evolved into a far more easily applied technology.

The RFID industry today is highly fragmented, consisting of many small system integration and hardware companies building one-off systems. The big companies are biding their time with R&D projects until the market seems ready to mature. Industry consolidation is required and may be triggered as large semiconductor companies enter the Gen2 tag space and the large computer and communications companies promote scalable and globally supportable RFID architectures (see the AMR Research *Alert* article "Will Flurry of RFID Vendor Activity Accelerate the Pace to Gen2?").

Long experience with standards and intellectual property issues

There appears to be lingering dissatisfaction with EPCglobal's Intellectual Property (IP) process and its standing as an international standards body. The companies that had explored the issue hoped that work on the ISO 18006 standards would alleviate these concerns, but IP issues could still limit high-tech companies from adopting the exact same standards as the Consumer Products industry.

The China (and Southeast Asia) card

A major concern of the companies is that Asia is striking out on its own with RFID variants, much like China has with wireless Internet. They see a reluctance of the Asian countries to adopt yet another world-changing technology perceived to be under Western control. High-Tech is the most global of industries, so real global interoperability is critical to success. Frequency allocation and power level-issues in Asia and Europe are just the tip of this iceberg.

Getting to an RFID roadmap

My observation to the group was that while much work in the RFID world has been done on the technical standards, I hadn't seen the path to creating a volume business. One strength of iNEMI is its technology roadmapping process, where companies work together to identify price and performance curves needed in components, power, and assembly technology to meet the needs of particular classes of products, as well as any standards issues that need to be addressed. Such a roadmap may be just what the RFID industry needs to get going.

Have questions or ideas about RFID use in the High-Tech and Discrete industries? Contact me at bswanton@amrresearch.com.