

Key Trends in RFID Technology

A report from the 2nd Canadian RFID Conference

RETAIL IS THIS YEAR'S "TIPPING POINT" IN RFID

The technology is poised for exponential growth
By Julia Kuzeljevich

Retail will serve as the tipping point for RFID in 2005, as more retailers issue mandates for the use of the technology across their networks, according to Edward M. Gonsalves, business development manager RFID, Phillips Semiconductors.

Gonsalves, speaking at the 2nd Canadian RFID Conference, held in Markham, Ont., recently, referred back to his 2004 presentation on RFID in which he called it the tipping point in auto identification.

The momentum of mandates to use RFID has since continued, he says, with more and more retailers looking at RFID tagging pilots at the pallet or item level.

Standards, says Gonsalves, will also move the market forward. The EPC (Electronic Product Code) UHF Class 1, Gen 2 standard has been drafted, adopted and ratified, and submitted to ISO for 180000-6C classification. Work is now beginning on an EPC HF Class 1, Gen 2 standard.

"There is now a general awareness and interest, as well as due diligence in RFID across a broad range of industries and economies. There is solid progress towards standards and products, but a great deal of work remains."

Gonsalves says there will be a lot to learn in terms of more proper alignments from the pilots adopted by retailers, but certain ROI truths for RFID adoption have not changed in the last year: that RFID results in the reduction of labour, the protection of assets and fundamental cost structure reduction.

William Allen, director of strategic alliances and programs, Texas Instruments RFID



Systems, says that the EPC standard has accelerated the RFID market, and that mandates have been the market drivers for adoption.

"A new generation of application development is poised for exponential growth," he says, noting the consultancy firm Accenture has charted RFID growth to number in the 800 billion item level tags reached by the year 2021.

"Technologies challenge business. Bar codes changed business practices, desktop computers caused a redeployment of IT technologies, and the integrated circuit changed the electronics landscape," says Allen, adding that Texas Instruments aims to offer a strap version of the RFID tag that essentially cuts out the inlay process to reduce costs.

The key to successful RFID adoption, however, will be interoperability between the players.

"All of this stuff has to work together, with all the tag companies able to be read by all the reader companies."

While RFID is considered a rather disruptive technology, he says, "out of chaos

comes order."

"The RFID application works when value is achieved, and this is judged by the benefits derived as measured by ROI," he says.

You're meeting your ROI, he notes, if RFID can help improve your efficiency and productivity, and reduce your costs.

Keep in mind that there are infrastructure installation costs and recurring costs associated with the solution.

"Get educated and trained, and identify a pain point where RFID can help you. Do a pilot, collect the data, analyze it and expand your rollout to the department level, and then to the enterprise. Keep analyzing the data," he says.

There are challenges ahead for RFID, notes Allen, such as early demand and performance expectations. Lack of proper training in RFID processes can also affect ROI.

The privacy issues for data should also be considered. The data that really needs focus, however, is that which will be held on all the servers.

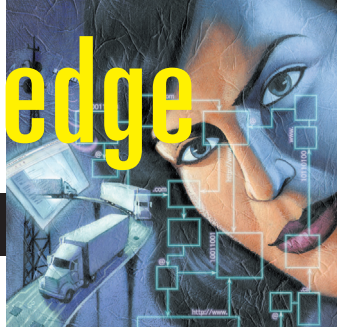
"We think RFID will be on the edge of new wireless sensor networks, sensing excursion, time expiration, pressure, ambient gases, etc." concludes Allen.

ACHIEVING ROI WITH RFID

It's early days yet, but finding the right RFID fit can pave the way to ROI

By Julia Kuzeljevich

Highly visible mandates from Wal-Mart, Target, the U.S. Department of Defense and the U.S. Federal Drug Administration are seeing RFID get a lot of attention. But



these mandates are still a long way from driving measurable supply chain benefits, making compliance one of the main drivers, says Nicholas Seiersen, senior manager, BearingPoint.

Seiersen, presenting at the 2nd Canadian RFID Conference, added however that beyond having to comply with mandates, companies may be looking seriously at RFID use because they're

trying to boost business, or enable brand new capabilities.

"Each one of those probably makes really good business sense but is not necessarily linked to ROI," he says.

Seiersen notes that what the mandates have in common is that most are doing slap and ship, starting small.

"The long term values may be unclear. Slap and ship is predominant. Why is it so hard to hear a valuable proposition for ROI? (Companies are) asking for faith and another few years, in my opinion. Few compliant suppliers have reached the tipping point," says Seiersen. However, he notes, the middleware choices you make today are going to affect your future as standards and the types of applications evolve.

Despite the hype cycle in 2004, in the short term RFID cannot live up to the promise that is being made, and Seiersen says users will experience the inevitable disillusionment.

"A lot of supply chains still look like siloes, and it sometimes becomes systems not flowing in the right way," he says. Meanwhile, recognition of the supply chain's importance at the C-level is not a universal scenario by any means.

"There's a lack of predictability in supply chains because they have to reach further out to get low cost supply. Increase of lead times spells more inventory, and costs borne," notes Seiersen.

But there are opportunities to leverage RFID if you take your assets and group them logically into opportunities.

For example, we can expect RFID to bring another sea of data, some of which will be greater enablers for what is already in your system. Seiersen advocates throwing it all into a data warehouse and playing with it, then putting it into your backend warehouse and working with it.

"Data from chips is just the tip of the iceberg. The XML process data may be even more revealing. Think of what the technology can do to help you do things differently. The real logic of the RFID solution will be in the process," he says.

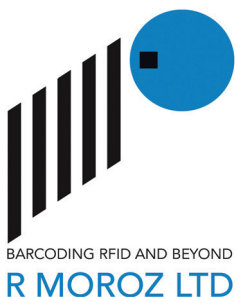
The standards, he adds, will also be useful when stabilized.

RFID is a mature technology, and there are no big technical surprises, notes Seiersen. But there are significant costs to



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consider in terms of hardware, installation, integration, and maintenance.

"When you're talking to vendors, separate science from sales. Consortia can be beneficial if the players have ironed out the kinks."

The main thing to remember in terms of determining ROI for you, is does RFID make sense for your business?

You are best off doing one thing at a time and completely, he says. "Don't spend more than you can afford. Be true to yourself."

RFID is ready for prime time, "but make sure you know why you are doing it," advises Seiersen.

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DOCTOR'S ORDER?

Improving item-level visibility and counterfeit detection in pharma chains

By Lou Smyrlis

Up to 7% of all drugs in the international supply chain may be counterfeit and the pharmaceutical industry is looking to RFID as a primary way to solve these problems.

"Counterfeit drugs are a global challenge to all nations... Reliable RFID will make copying of medicines less profitable," Peter Pitts, senior fellow, health care studies, Pacific Research Institute, told delegates of the 2nd Canadian RFID Conference.

Pitts added that counterfeit drugs made in South America or Asia and moved into the U.S. through Canada are posing a particularly vexing problem for U.S. regulators. The knock-offs so closely resemble the real thing it's very difficult

for Customs and other security agencies to notice the difference.

The U.S. Food and Drug Administration (FDA) sees RFID as the most promising approach for tracking, tracing and authenticating pharmaceutical products, said Pitts, who used to work for the FDA and is recommending widespread use of RFID in the pharmaceutical supply chain at the item level by 2007.

Industry pilots involving several retailers, distributors and manufacturers are currently underway. Some studies estimate that RFID-

based solutions could save the industry more than \$8 billion by 2006, according to a white paper produced by Philips Semiconductors, Tagsys and Texas Instruments.

The good guys aren't the only ones that will be using RFID, however. Pitts said eventually counterfeiters will start placing RFID tags in their knock-offs to fool inspectors.

"There's no simple answer because counterfeiters will adapt quickly to any measure," Pitts said.

But the benefits of RFID in the pharmaceutical supply chain go beyond the fight against counterfeit drugs. As the white paper explains, the pharmaceutical industry relies upon the integrity of many forms of data throughout the process of drug trials, manufacturing, distribution and retail sale. RFID's ability to uniquely identify each item and capture data without line-of-sight throughout the supply chain means benefits could include improved inventory management through out-of-stock item reductions, reduced shrinkage and more efficient product recalls, according to Pitts.

"The FDA believes RFID is much more reliable than the current paper-based system," he said.

It is estimated that up to 10% of U.S. retail inventory is stolen or diverted, according to the white paper which points out that RFID can be used to positively identify if returns were originally shipped from a particular manufacturer and at what price. RFID can also help deal with "gray market" distribution (products diverted to unauthorized channels), which costs companies and their customers hundreds of millions of dollars each year.

And by zeroing in on individual items and capturing manufacturing data, such as lot number and location information, RFID can significantly reduce the time spent identifying products targeted for recall as well as reducing the likelihood of a mass market recall of branded products, the white paper states.

The white paper included several examples of high-frequency RFID pilots underway in the pharmaceutical supply chain and health-care markets for item-level management. Here are the highlights from two of them:

- A major medical garment supplier imple-

mented an RFID-based solution to track, trace and manage more than one million reusable class II surgical garments within its supply chain. In order to withstand the intense heat and moisture conditions of the cleaning process, an injection-molded tag was developed and then affixed to the surgical gowns and drapes. Reaching nearly 100% accuracy, the medical garment supplier significantly improved inventory control, increased quality monitoring, and achieved productivity enhancements compared with the traditional bar code scanning process formerly in place. There was substantial short-term ROI which is expected to continue long term.

- Designed for use in operating rooms, catheter labs, as well as for radiology, orthopedics, neuroradiology, and cardiology departments, Mobile Aspects' HF-based inventory system has been implemented at four of the top 15 U.S. hospitals. The system automatically manages equipment and supply inventory, allowing real-time reports as supplies are removed from RFID-enabled cabinets, and integration with the hospital's information systems to facilitate seamless item replenishment.

Supplies are tagged with HF inlays, and the cabinet compartments contain RFID readers. Once an item is removed from the cabinet, the software requests a scan of the existing inventory, identifying all remaining items and noting which item was removed, by which particular staff person, and at what time. RFID allows this to occur automatically, without manual reading of bar codes. This item management system increases productivity, enhances quality of care, reduces costs and simplifies the overall process.

With its installations, Mobile Aspects has proven a less than one-year return on investment, a significant improvement on the typical two- to three-year payback for hospital inventory management technologies.

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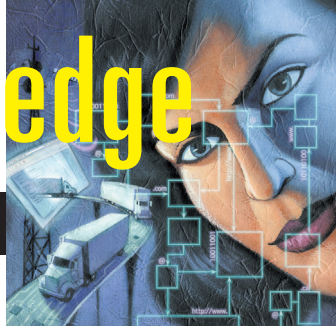
RFID IN RETAIL

The ultimate customer-centric solution?

By Julia Kuzeljevich

RFID has been strongly associated with retail thanks to major players like Wal-Mart, which anticipates US \$8.35 billion in savi-





ngs or 3% of its revenues from its RFID supplier mandates.

At the same time, with the exception of a small group of major retailers, the rest of the retail world has not embraced the technology, preferring to sit on the fence a little longer, says Christian Stephan, principal, consulting, Deloitte, Inc.

"The questions we have to ask ourselves for RFID in the retail space are what are the benefits of RFID?

"Are there applications beyond the supply chain? What are the key challenges and considerations? At the top of the value map for retailers is the ability to maximize shareholder value, to increase revenues, reduce operating costs, optimize the investment in the assets and enhance control," says Stephan.

On the operational cost side, there's the promise of improving receiving and shipping efficiency at the warehouses, eliminating manual inventory counts, reducing unsaleable promotional items and obsolescent stock.

According to a Deloitte survey there are certain trends at work in retail today that are major opportunities for the promises of RFID.

1) The empowered consumer – Today's consumers want immediate visibility into what's available.

2) The rise of strong brand identities – Customer preferences and awareness of certain brands, notes Stephan, is a good opportunity for retailers who can provide strong on-location assistance for brand identification at the retail level.

3) Proliferation of retail – The number of retail formats have mushroomed over the past few years as consumers want to save time and shop conveniently.

4) Changing demographics – Consumers are more concerned about their health and are requesting more product information as they purchase.

5) Small retailers leveraging strength of larger ones to "swim with the big fish" – RFID promises to help them achieve the same level of visibility.

6) Pyrotechnics in technology – Businesses are shifting to real-time information-moving into storing terabyte data, says Cameron Cuthbert, senior application sales consultant, Oracle Corp. Canada

7) Globalization-RFID promises to

help companies master the supply chain process across the world.

Realizing full RFID benefits is a long-term objective, says Stephan, but at this point, retailers should at least have a point of view on the technology and need to understand the short, mid and long-term benefits of it.

"Retailers need to develop their own roadmap, perhaps to adopt low investment and easy-to-implement RFID point solutions, not necessarily linked to the supply chain, that generate immediate business value, i.e. apply RFID to high value merchandise, to the WMS, to track assets and to security," he says.

"A lot of where we're going in retail is linked to where we've been. Retail is about to explode to be customer-centric, and RFID is going to be a big part of that," says Cuthbert. He notes that RFID could be used to respond to some crucial information challenges and lost opportunities in retail such as fine-tuning replenishment.

"We know what's off the shelf but can we better gauge what customers wanted but didn't find when they came into the store?"

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RFID BEYOND THE CUSTOMER MANDATE Industry Canada and SCL look at RFID adoption across Canadian firms

By Julia Kuzeljevich

RFID is a transformative technology that will impact productivity and sustainability across most industrial sectors. But while RFID is applicable in theory in all-industrial sectors, very few firms have found a way to demonstrate a solid business case for implementing RFID aside from maintaining an existing sales channel, said Phillippe Richer, project officer, logistics and connectedness, Industry Canada.

Industry Canada conducted a joint research project with Supply Chain & Logistics Canada and industry leaders across many sectors, with aim to guide small and medium-sized enterprises and their large customers about RFID applications beyond customer mandates.

Richer presented key findings from the project at the 2nd Canadian RFID Conference. He said that four sectors yield-

ed information for the project: the consumer products industry, aerospace, automotive, and the electronic components industry.

He said that as their first step, companies must make individual business cases for RFID, based on sound methodology.

"People within the company must be the decision-makers, not the consultants, whose strength comes in at the second stage. The key is getting to know your sector well," said Richer, which leads to the second step which is to assess RFID market trends.

"Nearly one half of the large Canadian consumer product goods market will use RFID within the next two years," said Richer, "and 48% of North American manufacturers expect an improved track and trace process with the technology."

Some 54% of the Canadian companies surveyed, however, don't have a supply chain management solution in place and have no plans to implement one, he noted.

For those who have supply chain technology, 40% of their solutions connect to both suppliers and buyers, 37% connect to suppliers only, and 22% connect companies to buyers only.

Step three is to establish a multi-function project team, said Richer, who added that senior management buy-in will determine the success rate of such an initiative. Firms must make sure that the key groups are involved at the start of building the business case, and a project budget must be identified from the outset so that work can be done to determine a return on investment and cost justifications the initiative will have for the company.

Two key drivers are leading Canadian

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- the Industry Canada/SCL paper "RFID Beyond Customer Mandate"
- the Aberdeen Group's paper "RFID-Enabled Asset Logistics Management"
- A.T. Kearney's paper "RFID/EPC - Managing the Transition"
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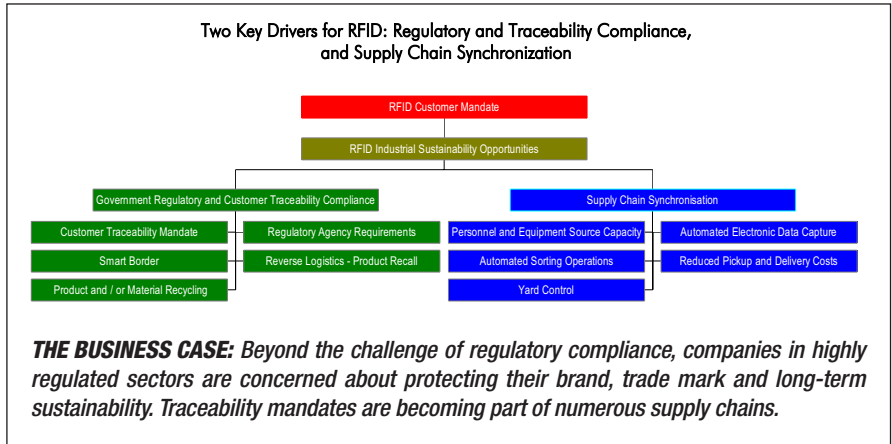
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business organizations to consider RFID: government regulatory and customer traceability compliance, said Richer, who added as an aside that there is a lot of evidence Canadian companies only tend to do things if they are mandated to do so.

Companies need to identify their needs and opportunities, said Richer, as ROI for the proposed solutions differs widely depending on the sector, product value, existing and expected regulations, client requirements, level of technological adoption by supply chains, and global corporate strategy.

“For general consumer product goods that cannot be regulated, not much can be done. But the potential is great elsewhere,” he said. Companies in highly regulated sectors such as agri-food, pharmaceuticals, electronics and chemicals can use RFID in their supply chains to enable better response to customer traceability mandates and regulatory requirements, and also to apply reverse logistics for product recall and product recycling and refurbishment.

There are challenges to RFID initiatives beyond customer mandates, and these vary widely, depending on the sector, said Richer. They include legislation in some sectors which still requires paper-based traceability, technology and the quality of captured information, standards and universal adherence issues, cost, and consultant and technology vendor expertise (and the issue



of trust, especially post “dot-bomb” era).

RFID is also expected to have a huge impact on human resources, and firms should make an assessment of this impact to be integrated into their cost analysis, said Richer. Teams will have the capacity to initiate ROI methodology if they establish key performance indicators to evaluate the long-term viability of their RFID projects, he added.

“Costs are generally the easier side to quantify in the return on investment estimate process,” said Richer.

An RFID roadmap is the final step in a business case, documenting the long-term perspective into specific action items linked to deliverable, performance indicators objectives, return on investment and

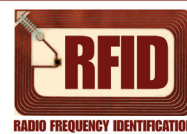
a project time frame. For some companies the first roadmap action item is still a wait-and-see approach to RFID with some involvement in associations and networking activities, or the implementation of a pilot project with a customer and a supplier.

“The next phase is we need to look at what we can do to make companies adopt these basic technologies. Many firms will adopt RFID to demonstrate it as an advantage tool for their customers. Consumer product goods companies that are highly regulated are ready to absorb most of the cost, especially those who are victims of a lot of counterfeiting,” said Richer. **CT&L**

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