

RFID technology

—| IMPACT and EFFECT on your ENTERPRISE |—

AN INDEPENDENT REPORT ON

Item-Level RFID Tracking

Sponsored By:

tyco / Fire &
Security



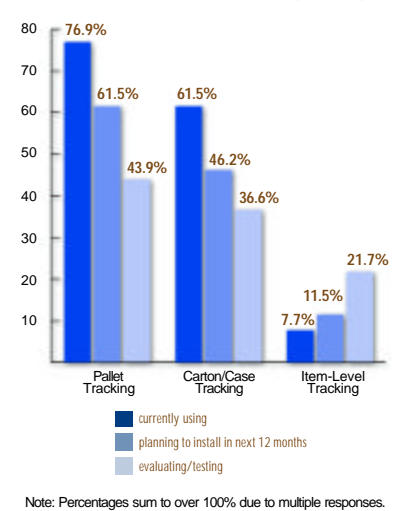
Market Analysis By:



- ▶ Which applications benefit from item-level tracking?
- ▶ Which item-level benefits are being realized right now?
- ▶ Which obstacles remain for item-level RFID tracking?
- ▶ What does the future hold for item-level deployments?

Item-level tagging continues to be labeled the “Holy Grail” for RFID. This label has been both a great marketing slogan and an unrealistic burden of expectation. RFID is used today for item-level tagging, but primarily in niche applications that have minimal transferability to new applications based on their unique operational, technical, or financial requirements and opportunities – think animal tagging, container tracking, and automated toll collection, respectively. These are three fairly solid niche market opportunities. But, none should be considered accurate indicators of the larger potential of more ubiquitous item-level tagging.

Retail CPG End-User Respondents Segmented by Primary Supply Chain Management Applications Being Supported
(Percent of Respondents Excludes Those Not Using/Supporting RFID)



To understand and more accurately predict the potential of RFID item-level tagging, we must dig deeper into these areas – operational, technical, and financial. And this digging, or discovery, needs to take place specifically for each application, installation environment, technical solution, and financial requirements set.

There are potential benefits to be derived from RFID item-level tagging; however, few are universal. Even those that face a number of

barriers to investment and adoption are based on perception and reality.

In this summary, we share some of our recent findings from our end user and evaluator surveys. The results are segmented in a number of ways from vertical market to applications, and they touch on some extremely important, but little-known, technical, operational, and industry infrastructure development issues.

Enabling Increased Visibility, A Better Retail Experience

In a retail environment, individually tagged items can provide numerous benefits both on the sales floor and in the back room. In the retail store, RFID provides the most value when used in conjunction with other traditional and emerging point of sale (POS) solutions. For example, an RFID-enabled smart shelf combined with digital CCTV video can send a theft alert with captured digital video to a store manager when multiple items are taken off the shelf at once. Through these technologies, retailers hope to achieve the following goals, ultimately creating a more responsive in-store environment:

- Gaining real-time visibility into inventory and product movement
- Providing customers with enhanced customer service as well as a more personalized shopping experience
- Offering alternative forms of payment and checkout
- Reducing shrinkage due to shoplifting, employee theft, and administrative/paper errors
- Store productivity through targeted marketing and promotions
- Staying ahead of the competition via differentiation through innovation

UK retailer METRO GROUP is possibly the most aggressive retail-

er evaluating RFID for in-store applications. Its high-tech Future Store in Rheinberg, Germany, is a test project where emerging retail technologies, including RFID, are being evaluated. Within METRO’s Future Store, RFID is being used to test a host of in-store POS applications, including:

Inventory Management: RFID is being used to allow store managers to track each shipment through the warehouse information system, providing information on which products to expect and when they are expected.

Smart Shelves: METRO is experimenting with smart shelf technology for item-level inventory applications. The firm tags individual items, which are then read by an embedded reader on the shelf. If an item is placed on or removed from the shelf, a message is sent to METRO’s ERP system to trigger an action (i.e. restock or remove).

Smart Shopping Carts: Shopping carts are fitted with personal shopping assistants with built-in RFID readers. This configuration enables customers to view an inventory of every item within the cart and pay via an automated checkout, thus removing the need to pack/unpack the cart.

Despite the benefits, the buzz around item-level RFID continues to fuel a “roller coaster” ride of hype. For example, leading electronics retailer Best Buy has just announced an expansion of its item-level pilot program. The firm is hoping to tag products such as DVDs, CDs, and video games by integrating RFID into a smart shelf solution. Best Buy is taking a proactive approach to item-level tracking by educating the movie studios and suppliers on RFID, which has helped to re-ignite interest in RFID from the entertainment industry.

On a similar note, the first RFID item-level tagged store was recently opened in the Netherlands. Boekhandels Groep Nederland, a Dutch book retailer, opened a store in Almere, Netherlands in which every book is tagged with a Raflatac Gen 2 tag. The books are tagged at a third-party warehouse. The company stated that another item-level store is expected to open in the fourth quarter of this year.

However, RFID item-level pioneer Tesco recently announced that it has dropped its plans to introduce item-level RFID tagging into its supply chain as a result of a recent pilot study. The retailer, still a strong RFID proponent, stated that it could not develop feasible operational and financial models unless the target items (DVDs, computer games) were source tagged.

Increasing Safety And Security For Pharmaceuticals

Among the myriad of business applications of RFID technology, the pharmaceutical industry has rapidly emerged as a key growth segment. Like other CPG producers, pharmaceutical manufacturers must meet retail or government mandates for RFID tagging at the pallet and case levels. However, the standout characteristic of the pharmaceutical supply chain is the amount of activity surrounding item-level identification. Pallet- and case-level tracking will improve and benefit end user business operations and efficiencies, but only true item-level tracking will meet pharmaceutical industry needs.

Adoption of RFID at the item level will be driven by several key business needs of the pharmaceutical industry:

- Anti-counterfeiting – to significantly reduce, if not eliminate, the supply of counterfeit pharmaceuticals as well as to increase brand

protection and tamper resistance

- Anti-diversion – to gain better control of and visibility into domestic and international pharmaceutical supply chains, particularly diverting shipments from low-cost regions to high-cost regions
- Cold chain distribution management – to verify the proper, safe transportation of sensitive pharmaceutical materials and products (i.e. temperature sensing/monitoring)
- Pedigree reporting – to comply with state laws that require chain-of-custody documentation electronically (e-pedigree) if possible, by paper if necessary
- Recalls – to be able to respond more efficiently and quickly when identifying and locating products in the event of a product recall

Adoption Challenges Remain

In both the retail and pharmaceutical markets, the debate over which frequency, HF or UHF, will prevail for item-level applications remains a significant hurdle to widespread adoption. HF, the more mature technology, is becoming more commonly adopted in the pharmaceutical industry, where companies such as Pfizer and GlaxoSmithKline have demonstrated successes at pilot levels. These firms (and their partners) have invested significant resources into further development, claiming that HF provides higher read rates and accuracy than its UHF counterpart.

UHF advocates argue the technology is still evolving and will eventually compete with HF for item-level applications. For example, Impinj recently introduced a near-field UHF tag that is capable of being used in both long-range and short-range applications and is claimed to be able to overcome interference caused by liquids (a primary issue with UHF at item-level).

Some firms perceive the frequency debate will result in a combination

of both. For example, Tagsys recently released a multi-frequency, multi-protocol reader for POS applications that is able to read both UHF and HF tags. The new reader delivers a practical approach for end users to obtain the benefits of item-level tracking without having to address the frequency issue. Work is underway at EPCglobal to develop both an HF and UHF standard for item-level applications, which will likely help drive forward item-level RFID adoption.

Although item-level tagging applications are being investigated in all verticals, there are few instances in which near-term commercial deployment is expected within the next five years. Widespread adoption of RFID for item-level tagging will not occur until:

- A consensus is reached on a preferred frequency and/or solution
- Performance (read rate, read range) and reliability (read accuracy, durability) are improved
- “Up-front” and transponder costs are significantly reduced to justify tagging lower-valued items
- Policies for safeguarding consumers’ personal information are developed and enforced
- International and vertical specific standards are determined
- Reliable and benchmark business models are developed.

The vision of item-level tracking has been a primary driver for RFID innovation since the development of the technology. The question today is not if RFID item-level tracking will be a reality, it is when. Recent market activity – such as the filing of Alien’s IPO and Savi’s acquisition by Lockheed Martin – demonstrates that the investment community is becoming more confident in the technology and that its potential will be realized within a reasonable period of time.



ADT Security Services offers the full spectrum of physical layer RFID products and services. Based on EPC open standards protocols, the company offers Gen 2 Readers, tags, antennas, printers and applicators as well as label placement certification, site surveys, installation and maintenance. Data integrity is the foundation of any successful RFID program and ADT delivers superior performance in this arena by integrating and testing all components of its RFID solutions prior to deployment to ensure the highest performance. As RFID projects expand, ADT also brings to the table sophisticated device management software and hardware that help control dense reader environments. ADT's solutions are designed for today and build upon technology that allows you to expand for the future.

For more information call
(877) 258-6424

or visit the Web site at
www.adt.com

About The Study

The retail CPG supply chain discussed here is currently under investigation by VDC as part of its 2005-2006 RFID Business Planning Service that consists of eight vertical market and seven technology market volumes. For further information about the "RFID Business Planning Service 2005-2006: Global Asset and Transaction Management Systems Market Analysis," contact Michael J. Liard, RFID practice director at Venture Development Corporation. To view the program proposal, go to: www.vdc-corp.com/autoid/annual/05/br05-21.html.

About VDC

Venture Development Corporation (VDC) is an independent technology market research and strategy consulting firm that specializes in a number of retail automation, RFID, AIDC, embedded, component, industrial, and defense markets. VDC has been operating since 1971, when graduates of the Harvard Business School and Massachusetts Institute of Technology founded the firm.



Michael J. Liard
RFID Practice Director
Venture Development Corporation
(508) 653-9000, ext. 130
mikel@vdc-corp.com