

About the Author

Rob Cushman is a senior manager in the Supply Chain Management practice of Accenture, and is based in Boston. Rob has more than a decade of experience with supply chain-related programs, with a primary focus in high-technology operations. Rob's functional experience and expertise is concentrated in the areas of manufacturing & distribution strategy and operations, supply chain planning, inventory management, service management, systems installation, business process reengineering and e-supply chain capability development. Rob's industry experience spans the end-to-end electronics value chain including: semiconductor equipment, semiconductor manufacturing (fab and assembly/test), contract manufacturing, OEM operations (procurement, planning, manufacturing, distribution), electronics fulfillment, electronics retail and wireless/RFID. Rob led the Accenture-sponsored RFID workgroup of 16 companies in the end-to-end consumer technology value chain referenced in this document.

About Accenture's Experience in RFID

Accenture is a pioneer in the area of RFID and electronic product codes. Accenture is a member of EPCglobal (formerly the Auto-ID Center), the group that is setting the standards for this technology around the world. For the past eight years, the Accenture Technology Labs have been immersed in RFID and electronic product code research and development. Accenture offers high-performance solutions that help our clients across varied industries to seize the opportunities this technology offers from efficiency and profitability to complete value chain transformation. Accenture is recognized by analysts and the media as the leader in RFID and electronic product code technology and its impact on business environments. For more information on Accenture and our innovative research in this area, please visit [www.accenture.com/silentcommerce](http://www.accenture.com/silentcommerce).

An Accenture High Tech Solutions Point of View:

# Radio Frequency Identification for Electronic & High Tech Companies

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Mandates from major electronics retailers are converging to accelerate the proliferation of radio frequency identification (RFID) technology throughout the consumer technology industry, perhaps faster than any previous technology of its kind. Rather than simply implementing "slap and ship" initiatives, now is the time to rethink fundamental business processes and strategies that can be enabled by RFID to develop high-value, game-changing application and higher-performance capabilities that will help differentiate companies in the marketplace.



# RFID: A Technology Revolution in the Consumer Technology Supply Chain

## RFID Addresses Traditional Challenges in the Consumer Technology Value Chain

Channel inventory balancing

Management of global product flows

Distribution center and retail store product handling

Replenishment execution

Distribution network and store shrink/theft

Promotions effectiveness validation

Returns/reverse logistics processing

Warranty claim management

In June of 2003, Wal-Mart fired a "shot heard around the world" with a long-awaited announcement of a mandate requiring its top suppliers to use radio frequency identification (RFID) by January 2005 and all suppliers by December 2006. In the following months, similar mandate announcements were made by Best Buy, Target, Tesco, Metro Group and the United States Department of Defense. These announcements and the building of RFID at commercial scale have launched RFID capability development as a near-term urgency for electronics companies operating in the consumer channel. Based on Accenture's initial work with both retailers and consumer technology companies, it is clear that RFID is now poised to enter the commercial mainstream just as the barcode did almost 30 years ago. Virtually every major player within the consumer technology value chain will need to evaluate and implement RFID as an integral part of its business model and infrastructure in the next two to three years.

After almost 50 years of incubation, RFID enablement of the global supply chain has moved from being an interesting "science experiment" to a commercially viable concept as the global marketplace has focused on a specific variant of RFID called EPC (Electronic Product Code). Originally pioneered by MIT's Auto-ID Center, and now managed as a global commerce standard by EPCglobal (a joint venture between EAN and the Uniform Code Council (UCC)), EPC is a low-cost, high-volume, passive tag standard targeted to large-scale tagging of products in global supply chains. The retailer mandates of Wal-Mart, Best Buy, Target and others are all focused on this EPC standard, creating an opportunity for consumer technology companies to develop a common solution to support all major customers. Several leading global companies have already implemented retailer-compliant solutions using EPC, successfully proving its commercial viability.

Accenture believes RFID will revolutionize the way that physical products, people and IT systems interact across the entire supply chain. Because RFID has been architected from its inception to serve as an Internet-based, low-cost and ubiquitous method of detailed data exchange across companies, it is poised to improve integration and execution among trading partners at levels unattainable by current technologies.

RFID's particular effectiveness at bridging the information gap at inter-organizational boundaries creates the potential to leverage the technology to resolve several long-standing supply chain challenges in the consumer technology value chain. Accenture envisions RFID will ultimately be used to link OEMs, component suppliers, contract manufacturers, logistics providers, distributors and retailers at levels currently impossible. RFID's inherent ability to identify and manage discrete units of individual product in the pipeline holds the potential to drive a quantum leap in end-to-end value chain performance.



## The Accenture Electronics Industry RFID Workgroup: Proving the Impacts of RFID in the Consumer Technology Value Chain

To specifically explore the expected impacts of RFID in the consumer technology value chain, Accenture organized and led a working group of companies from February to May of 2004 to explore the impacts of the technology across leading companies in the end-to-end value chain. The intent of this workgroup was to provide a forum for leading electronics companies to collaboratively explore RFID standards and capabilities as well as prove out the RFID value proposition across the complete electronics supply chain.

### What's different about RFID?

- Objects can "talk" to a network without human intervention
- Breaks line-of-sight requirement for product identification
- Establishes unique item serialization
- Creates low-cost, ubiquitous transactions
- Reduces data latency dramatically
- Particularly effective at inter-organizational boundaries

This effort brought together 16 leading companies in the consumer technology value chain, comprised of a mix of OEMs, electronics retailers, contract manufacturers, distributors and component suppliers including Best Buy, Celestica, Dell, Texas Instruments and others. Working closely together in a groundbreaking effort, this group undertook an ambitious effort to specifically identify cross-industry business solutions that would be enabled by RFID, key business processes that could be optimized using the technology, likely time phasing of when RFID capabilities would come online, and the industry cost/benefit analysis for RFID deployment.

During this intensive four-month effort, the companies focused on identifying common business priorities for RFID enablement. This exercise focused on finding "win-win" applications for RFID that would drive performance improvement and value creation for multiple parties in the value chain. Ultimately, an extensive list of RFID-enabled industry solutions emerged, highlighted by the following application areas:

- Inventory visibility
- Product handling productivity (manufacturing, distribution, retail store)
- Channel replenishment
- Product flow management
- Reverse logistics
- Warranty and repair management
- Product security (in transit, in store)

The workgroup also specifically quantified the costs, benefits and ultimate net present value (NPV) of deploying RFID-based solutions in the consumer technology industry.

While the specifics of this analysis are proprietary and confidential to the participant group, the overall five-year NPV in the industry was estimated at almost \$5 billion, with retailers and manufacturers splitting the benefits almost evenly.

Key sources of benefits associated with RFID enablement are expected to include:

- Labor savings
- Out-of-stock reductions
- Inventory reductions
- Returns processing savings
- Promotions ROI improvements
- Shrink reductions

Primary areas of RFID-related investment are anticipated to include:

- RFID tags
- RFID infrastructure (readers, antennas, middleware)
- IT infrastructure (additional server, router and network resources)
- Integration and deployment services (RFID software and facility hardware)
- Ongoing support and maintenance

## Where Can RFID Change the Game?

### Labor Efficiencies

Proximity reading of multiple RFID tags without human interaction enables large volume throughput of goods, either individually or aggregated in cases, pallets or truckloads, even as they are in motion.

### Data/Process Quality

Replacing human interaction reduces errors such as missed reads and wrong labels scanned. The unique product identification within the tag improves traceability and integrity by differentiating each "instance" of a product. Since products are now able to directly interact with their physical locations, they can facilitate their routing through manufacturing processes, warehouses and transportation vehicles, across multiple enterprises to the point of consumption. Data quality is radically improved across the entire supply chain.

### Real-Time Event Management

RFID provides the ability to capture and process high volumes of product-related events to facilitate real-time, tactical decision making. Every time a product is moved, received, issued, loaded on a truck or aggregated with other products in a vehicle or container constitutes a business event that can be captured and processed. Managing high volumes of real-time events enables new and highly responsive business processes. The latency problems associated with barcodes, such as products arriving at a location but not scanned immediately, are virtually eliminated.

### Knowledge Acquisition by "Listening" to the Product

RFID improves the capability to capture relationships between products and also with their environments based on their physical proximity. An RFID-tagged product that contains RFID-tagged components can identify and maintain its own configuration record. Processing larger amounts of RFID-acquired data from multiple sources can help characterize the behavior of various links in the supply chain, identify trends and needs, and create a knowledge base that identifies process inefficiencies, avoids potential problems and improves product forecasting.

The breadth of this study and the unparalleled mix of leading companies from across the consumer technology industry converged to generate a unique level of understanding of the true industry dynamics that will drive RFID adoption. Several unprecedented industry insights and findings emerged from this effort, including:

#### Tag cost insensitivity

Compared to many consumer goods sectors, the consumer technology segment is largely insensitive to tag costs due to high product values, channel inventory economics and moderate unit volumes.

#### Value is at item-level tagging

While incremental value can be achieved at case- and pallet-level tagging, tapping the largest value pool requires item-level tagging.

#### Value proposition for manufacturers and retailers is balanced

The benefits achieved for manufacturers and retailers is proportionally balanced based on investments each party must make.

#### Retailers bear the majority of costs

Much industry discussion has focused on justifying tag cost burdens to manufacturers; however, the majority of the cost will be borne by retailers for the infrastructure required at hundreds of stores.

Over the course of this effort, the participant group collaborated to develop a comprehensive understanding of the specific opportunities and constraints likely to drive uptake of RFID technologies across the consumer technology industry. Based on this analysis, the group defined the following expected time frames for RFID capability deployment across trading partners:

2005 - 2006  
Broad adoption of case- and pallet-level tagging of electronics products.

2006 - 2007  
Emergence of item-level tagging, tracking of items from point of manufacture through to the retail store floor.

2007 - 2008  
Deployment of RFID-enabled smart shelves at major retailers, manufacturer visibility to product in the retail environment.

2008 - 2009  
Use of RFID to track merchandising and retail promotions effectiveness. Returns and warranty processing using RFID tags embedded in electronics devices.

Based on this specific experience with leading companies in the industry, Accenture anticipates not only broad eventual uptake of RFID in the consumer technology industry, but also a strong likelihood that consumer technology will lead other industry segments in the rate of overall RFID uptake and ultimately be the category to move major retailers toward item-level tagging for higher value products.

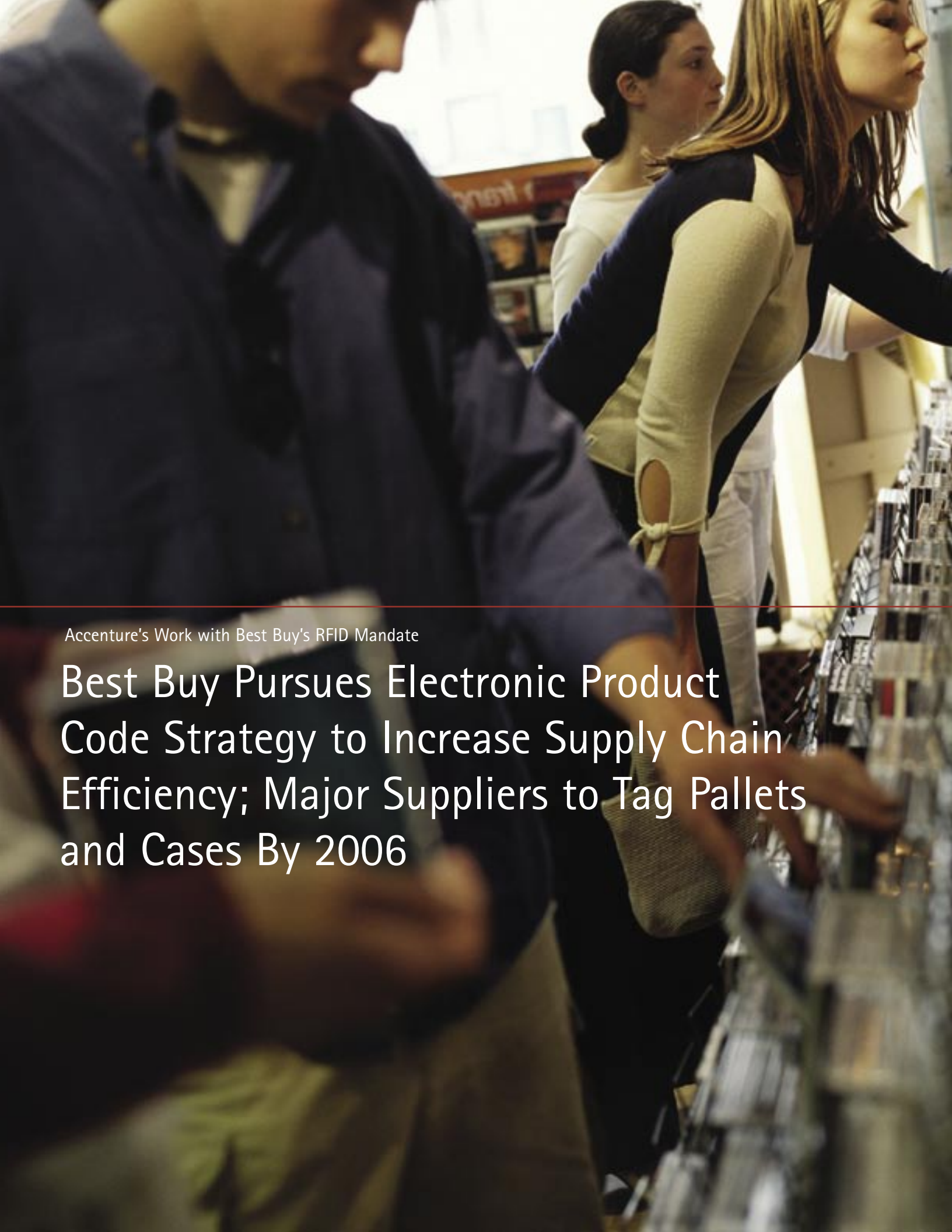


## Taking Measured Action – Smart Responses to the RFID Challenge

While RFID has often been characterized by the uninitiated as merely a replacement technology for barcoding, Accenture believes it will drive substantial change in the industry business model, fundamentally changing the nature of how companies interact with each other and the products moving across their combined value chains. While RFID and barcodes may continue to co-exist through a multiyear transition, RFID holds inherent technological advantages over bar code-based solutions that will become increasingly attractive as the costs of RFID solutions continue to decline. In the meantime, the promise of the rapidly emerging EPC standard and multiple compliance mandates from major electronics retailers are converging to accelerate the proliferation of this new technology throughout the consumer electronics industry perhaps faster than any previous technology of its kind.

Implementing RFID technology in itself, however, will not change the game. Many companies are seeking only to comply with customer mandates, such as those announced by Wal-Mart, resulting in “slap and ship” initiatives that simply add costs and do not provide benefits. Companies that are preparing to make the necessary RFID investments to achieve compliance with retailer mandates may consider the opportunity to extend their investments beyond minimal compliance and leverage new RFID capabilities to improve their bottom lines and performance. Rethinking fundamental business processes that can be enabled by RFID can result in value-based, game-changing transformations. The key questions to ask are: What new business capabilities can be realized with RFID technology? How can I use this new information to lower my cost, deliver new levels of service to my customer, create higher levels of performance and be the leading competitor in the marketplace?

Today's interim period, while RFID solution costs are coming down and the final technology standards are being resolved in large-scale industry pilots, presents a key window of opportunity for forward-thinking companies to begin assessing their RFID strategies and plans. Identifying and achieving the benefits from RFID requires a process of objective assessment, strategy development and realistic incremental investments that provide early returns while building the infrastructure and core capabilities required for the more strategic, game-changing applications. Many forward-thinking companies are choosing to make measured investments today, often exploring the likely requirements of their key customers, their own business case for implementation and potential sources of competitive differentiation by incorporating RFID into their business models.



Accenture's Work with Best Buy's RFID Mandate

## Best Buy Pursues Electronic Product Code Strategy to Increase Supply Chain Efficiency; Major Suppliers to Tag Pallets and Cases By 2006

**Business Wire, 31 August 2004**

Best Buy Co., Inc. today announced the rollout of an electronic product code (EPC) strategy designed to increase its supply chain efficiency over the next several years. The company plans to leverage radio frequency identification (RFID) technology to drive the change. RFID allows retailers to easily and efficiently track products as they move from the manufacturer to the stores.

Since RFID systems rapidly and simultaneously read tags, Best Buy believes the EPC strategy can improve customers' in-store experiences and significantly increase the organization's efficiency by increasing product availability, reducing time spent on processes in distribution centers and stores, enhancing real-time product information capabilities, and increasing speed to market.

"Our goal is to create a flexible, high-velocity supply chain operating with better product availability for customers at a lower total cost for the company," said Bob Willett, executive vice president of operations for Best Buy. "We believe RFID technology can transform the way products are produced, distributed and merchandised. Our own operations, customers and suppliers can share in the benefits."

Best Buy's EPC strategy supports the rollout of the concept to manufacturers, suppliers and customers. The company determined this strategy after understanding others' perspectives on EPC technology through its membership in EPCglobal, an organization working to standardize the global implementation of EPC in an ethical and responsible way. In addition, Best Buy participated in an Accenture-supported consortium that examined the potential benefits of RFID implementation across the consumer electronics supply chain.

The company also conversed with suppliers and surveyed customers. Best Buy now plans to team with Accenture to further define its RFID program strategy, manage rollout and implementation, and assist suppliers with meeting its integration and compliance requirements.

Willett added, "Our EPC strategy should ultimately result in a better customer experience. Customers will be able to more easily find the products they want, when they want them. In the long term, we hope that implementing EPC will enable us to enhance customer service and expedite processes for returns and warranties."

Best Buy's major suppliers are expected to begin applying EPC-compliant tags to product cases and pallets by Jan. 2, 2006, with all product cases and pallets tagged by May 2007. In preparation for these changes, the company also expects to test several applications of the technology in select stores and distribution centers in the coming year.

# A Call to Action

Many of Accenture's clients have already initiated the high-performance journey toward deployment of RFID capabilities as a key component of their future operating model. For many companies, this process starts with an Accenture-led executive workshop on the technology, including real-life demonstrations of the technology using prototypes from Accenture Technology Labs. Often the next step in this journey is the formulation of an RFID use strategy and business case, with a focus on preparing to engage with key customers and trading partners on RFID priorities and investments. Many top-tier suppliers to Wal-Mart and other major retailers have already deployed live technology to support compliance requirements.

For those companies that have yet to begin exploring RFID, time is of the essence. There are several actions companies can and should undertake in the short term to address the challenges and opportunities of RFID:

## **Learn the basics**

Acquire knowledge and learning related to RFID technology, standards, mandates and trends. Understand who the major players are in hardware, software and services, and what they have to offer. Educate a broad share of the enterprise organization. Identify potential stakeholders and champions.

## **Identify the opportunities**

Conduct workshops to identify potential RFID applications. Involve potential stakeholders from all areas of the business. Work with key suppliers, partners, customers and knowledge experts to understand and define potential RFID solutions that are synergistic and where value and benefits can be shared.

## **Develop a business case**

Identify the top one or two RFID applications and develop a comprehensive business case that clearly outlines the scope and size of the investment and defines the measurable benefits.

## **Pilot the technology application**

Develop an initial RFID application to demonstrate the technology capabilities in a real business environment and prove the business case. Select hardware, software and integration service providers. Involve suppliers and customers as applicable in a co-investment arrangement.

## **Plan the go-forward strategy**

Develop the longer-term plan for building out the pilot applications and launching additional RFID initiatives.

## **Coordinate activities**

Maintain high levels of involvement and coordinated participation across IT and business organizations within the enterprise and with key customers, suppliers and partners.

Clearly, RFID will become an integral part of the electronics industry landscape. The "wait-and-see" approach carries a much greater risk in the long run than over-investing. Early adopters stand to gain the most benefits from this new technology through accelerated learning and experience. The call to action is clear: companies that apply strategic thinking to RFID will be able to develop high-value, game-changing applications and higher performance capabilities that will help differentiate them in the marketplace.