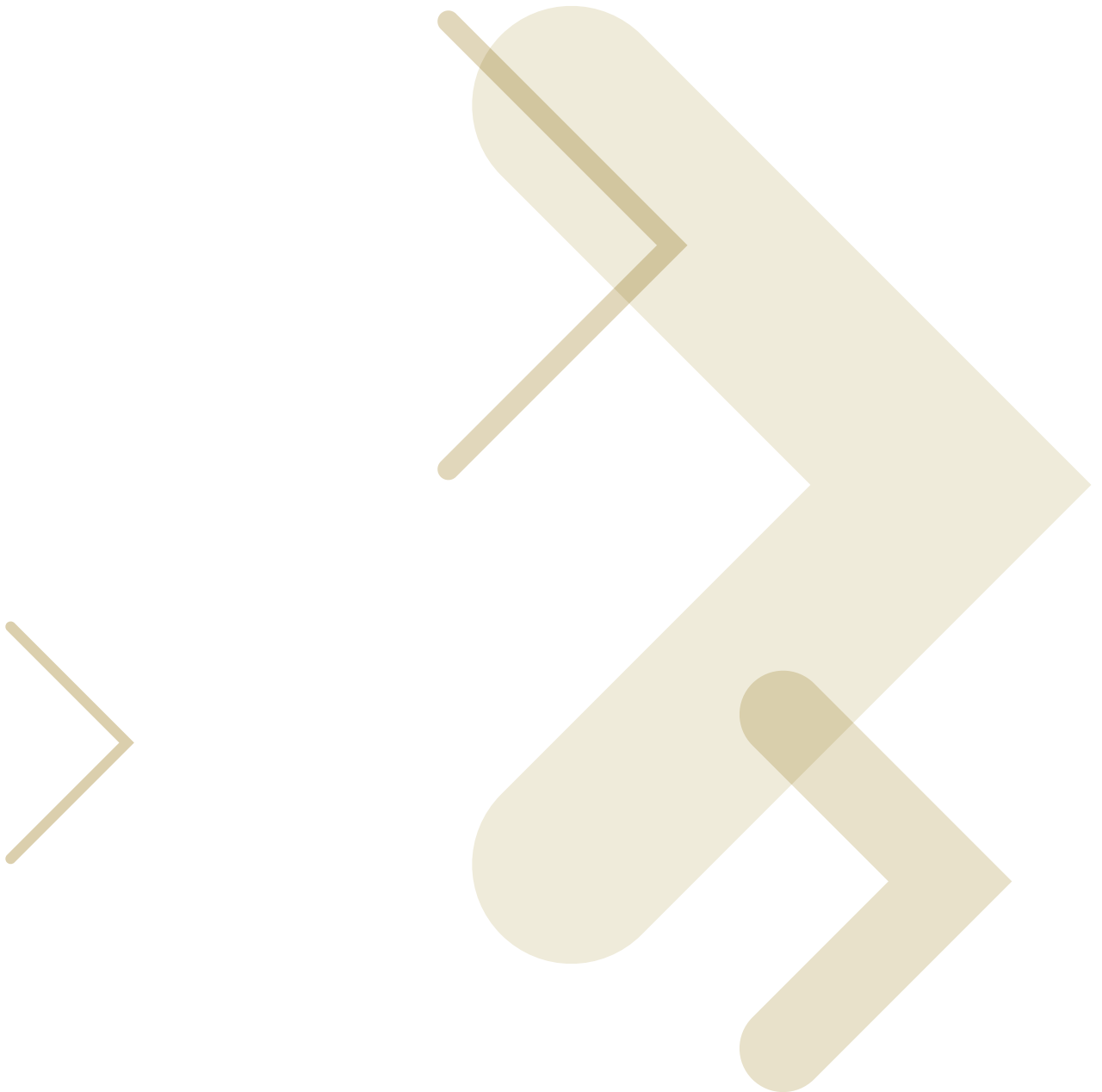




Business Benefits from Radio Frequency Identification (RFID)



Executive summary

Today the largest government and business enterprises in the world are developing plans to deploy electronic product code (EPC™)-RFID based solutions across their global supply chains and operations. These enterprises have initial deployments and programs that utilize RFID to build faster supply chains, which provide economic payoffs and greater visibility into merchandise movement.

With many enterprises adopting and mandating EPC-RFID, companies across the globe are posing the question: how do we identify and capture the business benefits of EPC-RFID technology? To help companies define and deploy RFID successfully, this paper addresses two topics:

- Benefits that can be achieved through RFID-based solutions
- Reviews the solutions adopted by companies in different markets

Structuring Your RFID Business Goals

The first step in measuring the value of RFID is to define a business map of the functional, technical and operational changes the enterprise is considering. Key questions are:

- How effective and efficient are the existing business processes?
- What are the effectiveness and efficiency goals for our processes?
- How can RFID help reach those goals?

This process grounds the RFID program in the reality of your specific enterprise. Creating a realistic business model that represents both the status quo and the economic impacts of RFID is essential.

Over the last several years, consulting firms, academics and individual companies have addressed the issue of defining the return on investment (ROI) for RFID. There is a growing portfolio of assessments and studies concerning how and where the ROI for RFID is generated. The following sections examine some of the value case elements involved.

Cost reduction

The cost reduction value case is a target area of many consumer packaged goods (CPG) companies, retailers and the United States Department of Defense (DoD). These enterprises expect to reduce inventory and inventory management expenses by billions of dollars over the next several years.

Examples of cost-reduction objectives for an RFID program include:

- Lower inventory stock levels
- Reduce waste
- Reduce manual checks
- Reduce inventory handling costs
- Reduce logistics costs
- Reduce claims and deductions
- Improve asset utilization

Increase revenue

Both large and small retailers and manufacturers are developing RFID deployments to drive sales. The utilization of RFID empowers

these companies to design innovative solutions with tangible benefits, including:

- Reduced out-of-stocks
- Improved order fill rates
- Reduced shrinkage
- Improved inventory turns
- Enhanced in-store customer support

Counterfeit product shielding

Quality manufacturers across the globe are losing sales, profits and their quality image from the expanding flow of counterfeit products. Equally important, counterfeits of many products (such as pharmaceuticals, currency, passports and aircraft parts) represent a safety and security hazard for customers across the globe. There are several deployments in place to identify counterfeits using RFID. These RFID tagged products, coupled with real-time databases, represent a viable information platform to prevent the distribution and sale of counterfeit products.

Shrinkage, theft and diversion prevention

High-value consumer and industrial products face the large risk of theft and diversion. RFID has shown considerable progress in:

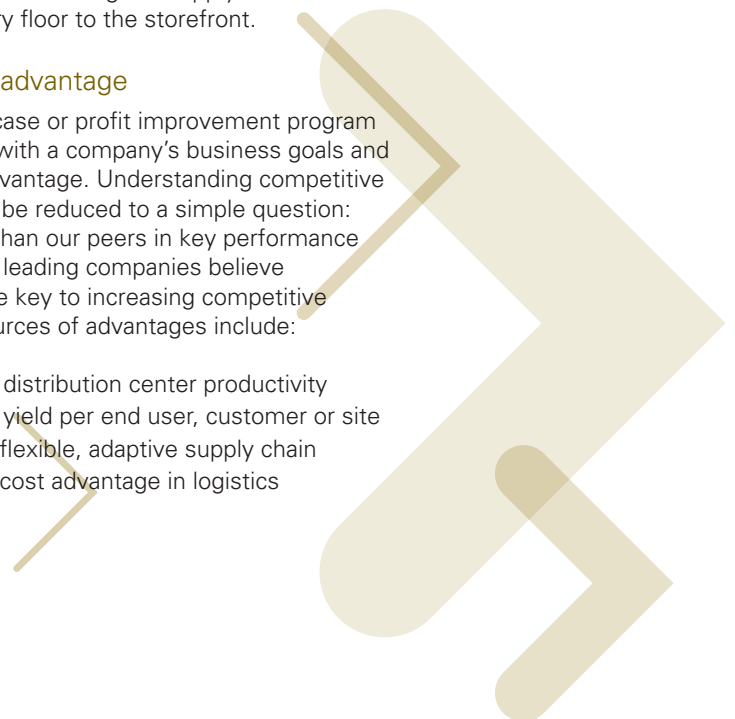
- Identifying theft and diversion at the shelf level
- Identifying theft and diversion points in the supply chain

As the price points of RFID products decline, this technology will provide a widely used tool to prevent theft along the supply chain—from the factory floor to the storefront.

Competitive advantage

Any business case or profit improvement program is intertwined with a company's business goals and competitive advantage. Understanding competitive advantage can be reduced to a simple question: are we better than our peers in key performance areas? Several leading companies believe that RFID is the key to increasing competitive advantage. Sources of advantages include:

- To increase distribution center productivity
- To increase yield per end user, customer or site
- To create a flexible, adaptive supply chain
- To create a cost advantage in logistics



- To reduce the impact on prices of recycling legislation for electronics
- To reduce the impact of homeland security measures (e.g., country of origin)
- To target an additional point of margin by a specific date

Industry Snapshots – Business Cases

Today there are thousands of RFID deployments and pilots around the world. RFID addresses a global array of business applications. A short list of examples includes:

- Retail supply chain
- Military supply chain
- Container tracking and management
- Pharmaceutical management and tracking
- Automated payment solutions
- Baggage tracking and management
- Vehicle, paper and aircraft assembly
- Asset tracking
- Document tracking
- Reusable pallet and container management

The development of the business cases behind these deployments generally followed several stages. Companies evaluated the benefits carefully with the costs. They defined and isolated the problems to solve and the opportunity to solve them with RFID. Working from business cases, they forecasted the annual benefits that the RFID solution would provide.

A number of industries have initiated pilots targeted to specific applications. In this section, we review the highlights of several of these pilots.

Retail

Retail interest in RFID technology is driven by the desire of companies to achieve greater speed and visibility into their supply chains, with the goal of increasing both operational efficiency and store effectiveness. An efficient supply chain operation ensures that goods can be delivered to the place and time when consumers are ready to purchase. Potential gains from the visibility RFID generates include lower inventory levels, reduced labor costs and increased sales, among others as shown in Figure 1 below.

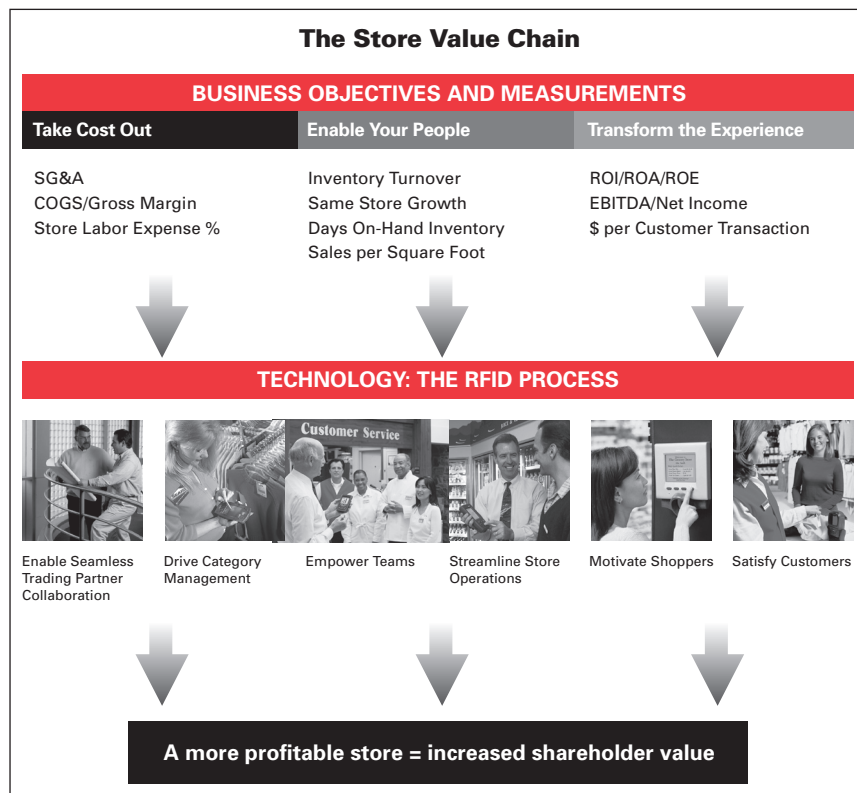


Figure 1

Creating more profitable stores is easily facilitated by RFID technology. The combination of focused business objectives and measurements plus RFID technology provides a powerful formula for achieving increased shareholder value.

Several retailers and CPG companies have deployed successful pilots of EPC-RFID. Targeted timeframes were announced by several companies to expand the implementations. The number and scope of these efforts are growing as companies seek the exact business and process models that will maximize their ROI for EPC implementation. The following list summarizes several of the benefits that retailers will capture with RFID-based solutions. These benefits can be grouped into issues of speed and visibility:

Benefits of Speed:

- Eliminate lost sales due to out of stocks
- Speed up store receiving, processing, replenishment plus point of sale (POS) and returns processing
- Notification of units needed on sales floor upon store receipt
- Satisfy customer requests immediately by locating products on sales floor and in the backroom
- Fast, accurate inventory audits
- Increased distribution center efficiency and accuracy

Benefits of Visibility:

- Unit, carton and pallet-level visibility throughout supply chain
- Immediate identification of exceptions at check points
- Visibility to replenish the right product to the right place at the right time
- Block defective merchandise and counterfeit merchandise

Currently, there is an emphasis on using RFID for applications that can track items from the manufacturing point all the way through to the store shelf. This process entails tagging pallets, cartons, reusable containers and individual items to track the movement of goods throughout the supply chain straight through to the sale of the item to the customer.

Manufacturing

Proprietary RFID-based solutions have been used for a decade in the manufacturing space. One of the established uses is in the automobile manufacturing process. Automobile companies attach read/write RFID tags to the car chassis. The RFID tags provide direction to and record the completion of each assembly process.

Other manufacturers are working hard to exploit the potential of RFID in their operations. Example benefits that manufacturers have identified include:

- Fast assembly
- Identify and eliminate counterfeit parts
- Improved accurate/reactive production planning
- Reduced stock/work in process (WIP), increase make-to-order
- Reduced efforts on stock counts
- Reduced product recall costs
- Correct parts identification, reduced maintenance
- Accurate and real-time inventory
- Accurate packing list and invoice information
- Cheaper disposal
- Tighter linkage to distributors

Linking the manufacturing floor to the retail floor: real-time inventory

Several manufacturers today are experimenting with RFID-based tagging of higher-value merchandise. Examples include designer apparel, electronics and pharmaceuticals. The concept is to audit the RFID tagged inventory on the retail floor and use that information to drive manufacturing and shipping of completed product.

In summary, RFID gives the producers total visibility into the movement throughout the supply chain. Relationships with retailers provide powerful incentives for offsetting some of the costs, with the agreement to share information with these valued trading partners.

Transportation and logistics

The logistics sector is positioned to be one of the primary beneficiaries of the adoption of RFID into the supply chain. It is important to recognize that the RFID compliance mandates generated by Wal-Mart®, the Department of Defense and others address the receipt of merchandise and assets into these large enterprises.

For the logistics industry, with its position between suppliers and customers, RFID tagging and the underpinning mandates represents a great opportunity to expand the portfolio of offered services. Logistics opportunities include:

- Work with shipping customers to provide RFID compliance services that solve the compliance challenge
- Expand service and revenue base to suppliers and customers by using the RFID tags to define new information-based services as a source of competitive differentiation

- Talk to receiving customers who have issued a compliance mandate; explore the question: could the logistics carrier use the RFID-tagged merchandise to provide innovative services to the receiving company?
- Look at using EPC in cross-docking operations to increase efficiency
- Faster delivery turnaround
- Faster custom clearance
- Theft prevention

Distribution center operations

EPC-RFID based applications have drawn extensive interest in the operation of the distribution center. Innovators argue that RFID technology can make distribution centers more cost effective. Several studies have suggested the operational improvements available through RFID can be summarized as follows:

Shipping and Receiving:

- Automated processing of loading and unloading
- Reduced labor requirements
- Faster processing
- Automatic cross docking

- Automatic generation of 100 percent accurate electronic manifests

Storage and Fulfillment:

- Correct product storage locations
- Faster product retrieval
- Fewer order errors
- Reduced losses and shrinkage of assets
- Improved order fill rates and times
- Less safety stock required

Task and Resource Management:

- Automatic updating of tasks for each resource
- Improved automation and accuracy of flow control
- Improved real-time monitoring of operations
- Automatic conveyance and sorting
- Automated and accurate picking and packing

RFID-based solutions need to be kept in focus. A primary objective of RFID-based systems is to provide real-time visibility into all of the supply chain. To achieve that end, the distribution center needs to be part of the real-time, RFID-enabled supply chain.

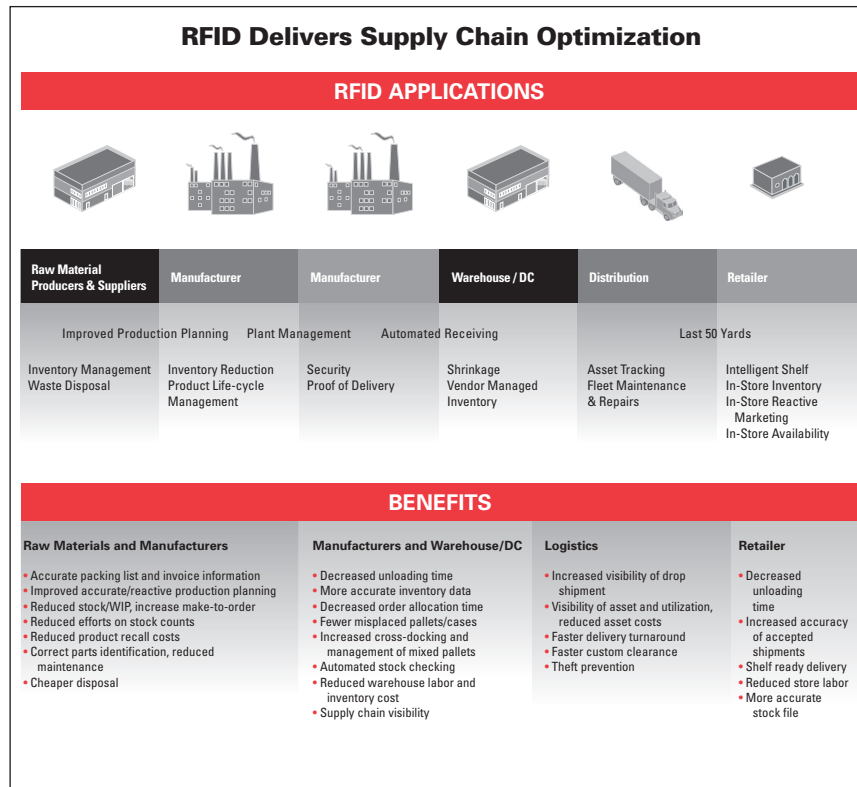


Figure 2

With RFID applications used across the supply chain, everyone benefits — from the raw materials manufacturers to distributors to consumers.

Overview of Benefits

RFID is one of the first new technologies of the millennium. There are a myriad of opportunities to pursue using RFID technology. Figure 2 summarizes some of the applications that are being adopted in the supply chain.

Summary

A successful RFID business case needs to address several subjects.

Identification of the business objectives and benefits that the enterprise is pursuing

- Enhanced merchandise or asset management
- Reduced operating expenses
- Higher revenues and/or margins

Develop a technology assessment and plan that addresses the available RFID technology solutions

The technology plan should address data collection/analysis and establish the baseline data sources for operations. When a company evaluates RFID technology, there is a need to understand several key issues to avoid technology dead ends. Those include:

- EPC-compliant RFID technology
- Reader platforms that are software upgradable
- Systems that can manage large volumes of data
- Applications that can scale as the deployment expands
- Perhaps most critical, working with a large globally capable partner who can deliver in-depth RFID support

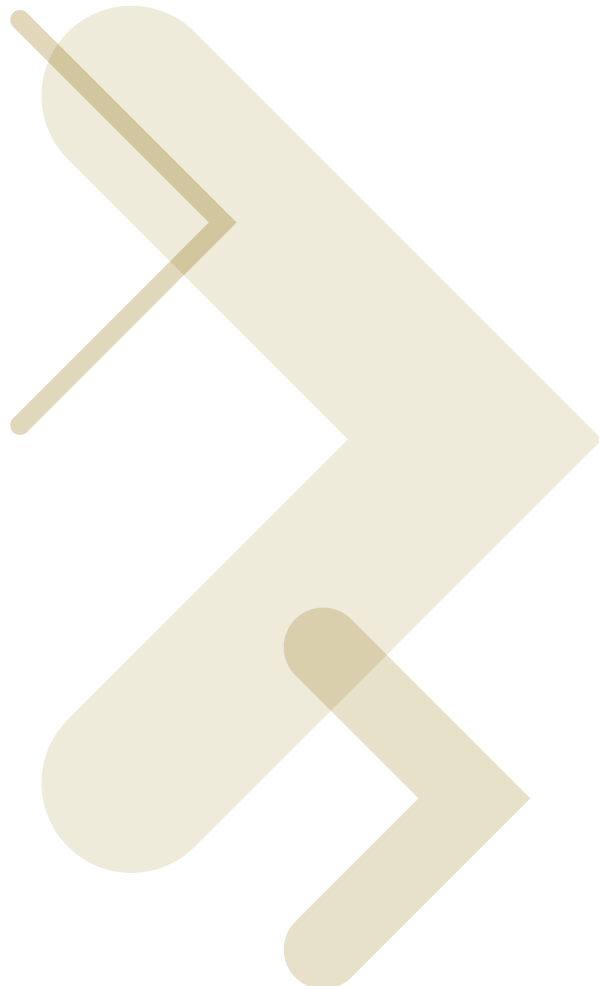
The leveraging of innovative applications in business concepts and RFID technology creates the opportunity to drive business success for companies across the globe. As the leading RFID provider in the world, Motorola can make your RFID vision a reality.



Motorola and EPC-RFID

Motorola designs EPC-RFID solutions that integrate seamlessly with other key technology and product offerings, including advanced data capture devices such as bar code scanners and imagers, mobile computers and wireless infrastructure.

Increasing interest in RFID has expanded beyond retail and government. Virtually every market Motorola serves, including manufacturing, transportation and logistics, wholesale distribution and healthcare can benefit from RFID solutions. Motorola's commitment to RFID products and solutions has been and continues to be a top corporate priority. Motorola's global sales and support capabilities coupled with our extensive portfolio of products and experience provides customers with a fully capable solution for their RFID needs.



TECHNOLOGY BRIEF

BUSINESS BENEFITS FROM RADIO FREQUENCY IDENTIFICATION (RFID)



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