



# Understanding RFID Challenges and Risks—

Developing a pragmatic approach for wholesaler-distributors

# Executive Summary

## Introduction

The wholesale distribution industry in North America continues to face immense changes in its business environment. Customers are more demanding, old competitors are more innovative, new competitors are emerging and suppliers are pioneering new business models. Industry and government regulations for safety and security are challenging wholesaler-distributors' current capabilities. Furthermore, technology continues to bring customers and suppliers closer together – threatening wholesale distribution business models. Past business and supply chain practices will not suffice in this new environment.

Radio Frequency Identification (RFID) presents both an opportunity and a challenge in the face of these vast changes. Significant developments have brought new focus to RFID adoption and commercialization. Key market drivers include usage mandates, improving cost economics, demonstrated adoption benefits, technological advances and standards development. However, most wholesaler-distributors have not yet made RFID adoption a priority in their businesses.

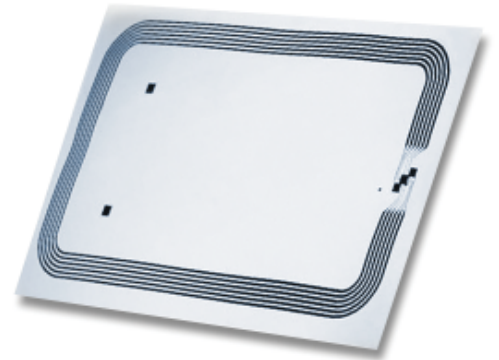
To succeed in today's business environment, wholesaler-distributors must demonstrate world-class capabilities in core competencies, such as:

- Inventory management and distribution
- Order processing and fulfillment
- Customer value-added service and support

RFID will be a required best practice among these core competencies – leading to widespread adoption. This paper provides a unique point-of-view on the impacts, challenges and opportunities presented specifically to wholesaler-distributors by RFID. It also explores the role RFID will play in the future of wholesale distribution business models.

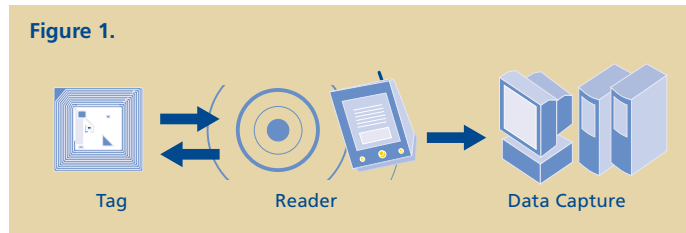
## Key Takeaways

- RFID can benefit shareholder value by reducing costs, improving asset utilization and increasing revenue, but each wholesaler-distributor will be affected differently.
- Not every wholesaler-distributor can realistically use RFID within its operations; adoption will depend on factors such as size and industry segment.
- Numerous market forces are propelling RFID forward, leaving some wholesaler-distributors with no choice but to embrace RFID.
- Each wholesaler-distributor's approach to RFID adoption will depend on the expected benefits and associated costs.
- Companies should not underestimate the economic, technical and implementation challenges associated with RFID
- Wholesaler-distributors' greatest risk is doing nothing in the face of change. Determining your company's "tipping point" and conducting a business case are critical first steps in understanding the right time – if ever – to embrace RFID.



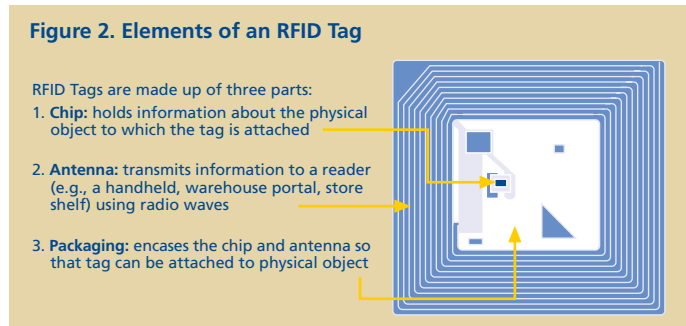
# RFID Background and Overview

Radio Frequency Identification (RFID) technology enables object identification using radio waves. RFID allows a tagged object to carry unique identification and descriptive information that can be electronically read at distances ranging from one inch to approximately 100 feet. It uses a safe, low-power radio frequency signal that is transmitted to a reader from a tag as illustrated in Figure 1. Data-capture from an object's tag is immediate and accurate.



An RFID tag is made up of three basic elements – a microchip, an antenna and backing material known as a substrate described in Figure 2. These three elements are part of every RFID tag. More advanced, battery-powered tags can carry a wide range of information, including sensory data (e.g. temperature and moisture levels). These ‘active’ tags offer a full picture on the condition, quality, quantity, and real-time location of the tagged object. Less sophisticated, ‘passive’ tags provide a product identifier and an associated unique serial number for each tagged object.

RFID is part of a larger family of automatic identification technologies (e.g. global positioning systems and Internet-enabled cellular services). While it is often referred to as a



next-generation barcode, as illustrated in Table 1, this expression underestimates RFID's distinct advantages in the areas of capacity, flexibility, accuracy and durability.

RFID will help businesses to reduce costs, improve asset utilization and grow revenues. However, like all technologies, RFID must be accompanied by business process changes and supported with training and development. Properly adopted RFID systems will allow wholesaler-distributors to:

- Locate products and make real-time decisions based on that information
- Control assets for more-efficient utilization
- Remove costs from the supply chain to improve margins and remain competitive
- Share transaction information with customers and suppliers
- Deliver innovative, value-added services based on product and transaction information

Despite these benefits, not all wholesaler-distributors need to embrace RFID technology at this time. Barcodes – as a proven, mature technology – will continue to provide some companies with solutions that are both stable and appropriate for their specific business needs. For many wholesaler-distributors, however, the need to adopt RFID is much more urgent.

## The “Black Art” of RFID

RFID uses radio waves as the communication medium between tags and readers. When something close to the readers or tags interferes with the radio waves, read-rate accuracy decreases. The environment, packaging and contents of a product can all affect radio waves. Sources of environmental interference can range from air conditioning to power supplies to conveyor belts to dust. Common packaging and product contents that can cause interference are liquids and metals. Consequently, each installation of readers and tags requires mastering the “black art” of RFID.

**Table 1. Characteristics of RFID Versus Barcode Technologies**

	Barcode labels...	RFID tags...
Capacity	<ul style="list-style-type: none"> <li>• Have limited space</li> <li>• Are read-only</li> </ul>	<ul style="list-style-type: none"> <li>• Hold substantial amounts of data</li> <li>• Carry a unique identifier</li> <li>• Allow for data reprogramming</li> </ul>
Flexibility	<ul style="list-style-type: none"> <li>• Require line-of-sight scanning</li> <li>• Allow for one simultaneous scan per read</li> </ul>	<ul style="list-style-type: none"> <li>• Do not require line-of-sight scanning</li> <li>• Read through most substances</li> <li>• Support simultaneous reading</li> </ul>
Accuracy	<ul style="list-style-type: none"> <li>• Require human intervention, which opens the possibilities for errors</li> </ul>	<ul style="list-style-type: none"> <li>• Require little to no human intervention, which reduces errors</li> </ul>
Durability	<ul style="list-style-type: none"> <li>• Can be easily damaged or destroyed</li> </ul>	<ul style="list-style-type: none"> <li>• Withstand harsh environments (e.g. outdoors, chemicals, moisture, extreme temperatures)</li> </ul>

## Impact on Wholesaler-Distributors

Numerous market forces are propelling RFID forward, but regulatory and customer mandates are the ones that will exert the most pressure on wholesaler-distributors. Some lines of trade will feel this sooner than others, however Deloitte expects that large customers and influential regulators will drive pervasive use of RFID in the wholesale distribution supply chain.

Current regulatory and customer mandates are primarily focused on supply chain benefits; however, we fully anticipate that the US government will introduce different types of stipulations. These mandates will be tied closely to policies around homeland security and defense and will focus on ensuring supply chain integrity. Depending on the segments affected, some wholesaler-distributors may find themselves at the center of these requirements, with little or no room to maneuver.

A chain reaction will be triggered throughout the wholesale distribution industry as customers, suppliers, competitors and regulators adopt RFID. Existing pressures for wholesaler-distributors to increase service levels, exhibit distribution expertise, improve fulfillment reliability, provide product track and trace, and offer self-service capabilities will intensify. The following section examines the end-to-end wholesale-distribution supply chain, outlines current RFID activity and discusses the expected implications.

### Customers

In the consumer business industry, large retailers (e.g. Wal-Mart, Target, Best Buy and Albertson's) are requiring food and non-food suppliers to tag product at the case and pallet level in early 2005. Some of these same retailers have announced even more-stringent requirements for their pharmacies (e.g. item-level tagging for class II prescription drugs).

In the industrial sector, the US Department of Defense (DoD) and NATO have already adopted RFID. The US DoD will require supplier tagging beginning in early 2005 for select commodities and locations. This mandate will eventually encompass 60,000 suppliers and over \$250 billion in purchases. Military mandates such as this have spurred manufacturers such as Boeing and Airbus to announce that they too will issue RFID-tagging requirements for suppliers.

These large, market-movers anticipate tremendous benefits in the way of product visibility, traceability and availability; paperless order and financial transactions; and reduced operating costs. Upon seeing these initial benefits, other small, medium and large wholesale distribution customers will be compelled to adopt.

The implication is clear: Wholesaler-distributors, many of which are already in a crunch to demonstrate value to their customers, will have no choice but to comply with tagging mandates.

Customers will not only expect them to apply the tags, but also to deliver the cost and service improvements that RFID promises. Initially, these mandates will be from a few large market-movers; however, over time a "me-too" effect will lead to other, less obvious customers requiring RFID tagging as well.

### Manufacturers

Manufacturers face a dilemma: Their products must be tagged in order to maintain relationships with some of their largest end customers. Many of the manufacturers that work through wholesaler-distributors are currently struggling to deal effectively with RFID requirements. Those that have a direct relationship with the end customer are experiencing even more pressure due to the customer-driven expectations mentioned above.

Manufacturers have three options in the face of the tagging mandates and mounting expectations:

1. Do not adopt RFID and risk losing the customer
2. Adopt RFID and tag internally
3. Adopt RFID by outsourcing tagging to a third party

Option one is an unlikely choice because the loss of revenue would be too severe. Options two and three are more likely choices and each presents a variety of implications to wholesaler-distributors.

Option two may become a favorable alternative for those manufacturers who have some degree of direct relationship with the end-customers that have issued the mandates. This is especially true if the manufacturer can create a positive business case for adoption. A danger to wholesaler-distributors may arise if manufacturers employ RFID as a mechanism for restructuring and integrating their supply chains. Disintermediation of wholesaler-distributors could occur if manufacturers start to discover that RFID-related benefits, such as reduced order cycle times and improved inventory visibility, can bring them closer to their end customers.

Option three will likely be the most attractive scenario for manufacturers, particularly when they cannot justify a business case for internal adoption. Here they will rely on wholesaler-distributors or other third parties to insure that their products meet end-customer RFID-tagging requirements.

Clearly, this presents wholesaler-distributors with an opportunity to demonstrate their value to manufacturers. Today, manufacturers are already seeking more detailed information about the movement of their products and more direct engagement with end customers. If they choose to do this through opportunistic adoption of RFID, wholesaler-distributors can expect further disintermediation. However, if wholesaler-distributors add RFID tagging to their portfolio of innovative services, they can deliver value to manufacturers and strengthen their business proposition.

## Competitors

RFID will be yet another factor fueling the intense competition among providers of logistics and physical delivery services. Numerous third-party logistics (3PL) providers are adding RFID tagging capabilities to their list of services. Furthermore, prominent logistics providers (e.g. UPS, FedEx and DHL) are actively experimenting with RFID not only for internal supply chain improvements but also to build compliance tagging solutions. Their intention is to use RFID to improve the physical flow of goods within their four walls. This could enable 3PLs to usurp wholesaler-distributors' role in customer order processing and fulfillment.

In order to prevent commoditization of logistics and physical delivery, wholesaler-distributors should consider using RFID to augment their value-added service offerings. By going beyond simply tagging for compliance, wholesaler-distributors can offer RFID-enabled benefits (e.g. automatic inventory replenishment, enhanced collaboration, improved track and trace) to both suppliers and customers. This strategy could accomplish the dual objectives of preserving market share and creating an end-to-end value proposition that is attractive to all entities. In addition, some wholesaler-distributors may enjoy a window of opportunity to charge for value-added services by providing RFID-enabled capabilities ahead of their competitors.

### What Is a 3PL?

Third-party logistics (3PL) describes an organization that manages and executes one or many of a variety of logistics-related services, using its own assets and resources on behalf of another company. Types of services include transportation, warehousing, cross-docking, inventory management, packaging, and freight forwarding.

## Regulators

Numerous domestic and international regulatory bodies have issued strict guidelines for product labeling, tracking and tracing. Products coming under these regulations range from livestock to prescription drugs to tires (see Table 2). Such guidelines are serving to accelerate RFID adoption as the preferred – and often the only – viable solution to meet these requirements.

**Table 2. Examples of RFID-Related Regulatory Requirements**

Regulatory Body	Requirement
US Food and Drug Administration (FDA)	<ul style="list-style-type: none"><li>• Outlined drug labeling and tracking requirements</li><li>• Insists on RFID as the primary enabler</li><li>• Plans to mandate usage if industry does not self-adopt</li></ul>
EU and US Food Safety (e.g. FSA, FDA, USDA)	<ul style="list-style-type: none"><li>• Requires 'one back, one forward' traceability</li><li>• Information must be available to authorities on demand</li><li>• All legislation becomes effective January 2005</li></ul>
US TREAD Act	<ul style="list-style-type: none"><li>• Requires tracking of tires to facilitate streamlined recalls</li><li>• Major consumer safety issue</li></ul>
TSA/C-TPAT (Custom-Trade Partnership Against Terrorism)	<ul style="list-style-type: none"><li>• Container Security Initiative (CSI)</li><li>• Smart &amp; Secure Tradelanes (SST)</li></ul>

Wholesaler-distributors may not feel any direct regulatory pressure today depending upon the industry sector(s) they serve and the regulatory jurisdictions they fall under. However, product suppliers and end customers will certainly be forced to conform to the rules or face non-compliance penalties. Once again, if wholesaler-distributors can facilitate compliance they will be adding value to the supply chain.

## RFID in the Pharmaceutical Supply Chain

Healthcare distribution, as a line of trade, tends to remain on the leading edge of technology. Therefore, it typically serves as a good barometer of where other lines of trade may be heading (see Table 3). Recently, large customers, such as Wal-Mart, and influential regulators, such as the US Food and Drug Administration, have driven RFID adoption in healthcare distribution: Wal-Mart through its mandate for item-level tagging of Class 2 narcotics and the FDA through its guidelines for unit labeling, tracking and tracing. Additionally, benefits across the supply chain related to anti-counterfeiting, loss prevention and monitoring of drug re-importation have stimulated activity.

Wal-Mart's pharmacies and those of other retailers, grocers and drug-store chains rely heavily on wholesaler-distributors for significant portions of their pharmaceutical products. Wholesaler-distributors have enjoyed a solid position within healthcare distribution because their value proposition to both retailers and drug manufacturers has been proven over time. To maintain that position and to continue adding value to the pharmaceutical supply chain, wholesaler-distributors are responding aggressively. They are also being motivated by two other factors:

1. RFID offers an opportunity to realize internal business benefits.
2. Third-party logistics providers are emerging to offer suppliers outsourced tagging solutions.

At present, healthcare wholesaler-distributors are cooperating with their suppliers to meet RFID tagging milestones. Just short of issuing a mandate, wise wholesaler-distributors are using their leverage and the promise of RFID-enabled benefits to encourage upstream supplier tagging. This has placed the burden of tag costs on manufacturers, thereby minimizing impact on cost of goods sold and preserving margins for wholesaler-distributors. Creative approaches such as these enhance the wholesale distribution value proposition while containing costs and minimizing business disruption.



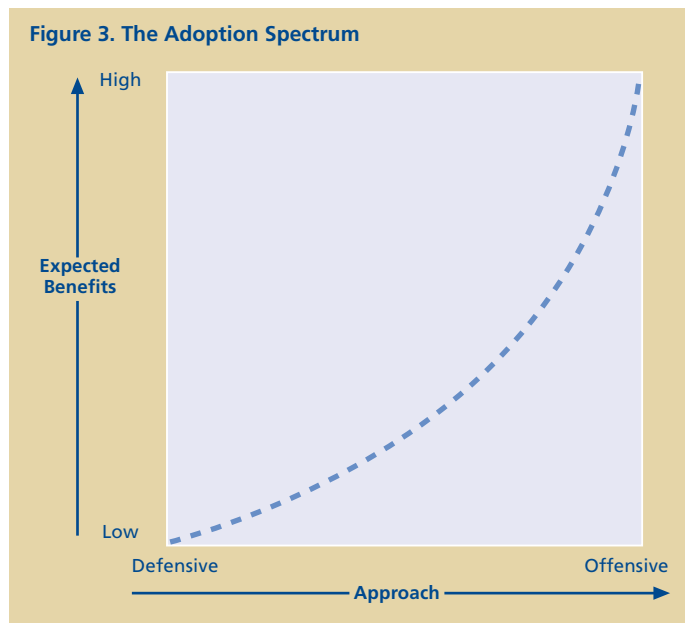
**Table 3. RFID Across Lines-of-Trade**

Industry	Market Drivers	Major Players
Consumer Business	<ul style="list-style-type: none"> <li>• Large retailer initiatives</li> <li>• Food safety requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Wal-Mart</li> <li>• Target</li> <li>• Albertson's</li> </ul>
Pharmaceutical	<ul style="list-style-type: none"> <li>• Large retailer initiatives</li> <li>• Safety and security requirements</li> <li>• Drug validation, counterfeit protection measures</li> </ul>	<ul style="list-style-type: none"> <li>• US Food and Drug Administration</li> <li>• Wal-Mart</li> <li>• US Department of Defense</li> </ul>
Industrial	<ul style="list-style-type: none"> <li>• Product recall initiatives</li> <li>• Process control and inventory management</li> </ul>	<ul style="list-style-type: none"> <li>• US Department of Defense</li> </ul>
Transportation & Automotive	<ul style="list-style-type: none"> <li>• Airport boarding security badges</li> <li>• Electronic payment and ticketing</li> <li>• Yard management and fleet tracking</li> <li>• Baggage tracking</li> <li>• Manufacturing automation</li> </ul>	<ul style="list-style-type: none"> <li>• TSA</li> <li>• Ford</li> </ul>

## Benefits for Wholesaler-Distributors

Many in the marketplace, including large wholesale distribution customers, believe that the benefits of RFID can be significant. Most of these large customers are taking highly aggressive – or offensive – approaches to capture RFID benefits by investing in infrastructure and mandating supplier participation. Others in the marketplace who are skeptical of RFID-enabled benefits are taking a more cautious – or defensive – approach.

Wholesaler-distributors will need to weigh the expected benefits from RFID adoption prior to selecting an approach. The degree of expected benefits should drive the selection process. If expected benefits are high, an offensive approach is warranted. If anticipated benefits are low, a defensive approach is more appropriate. Each wholesaler-distributor should evaluate its unique situation in determining an approach, which may fall anywhere within the defensive-to-offensive spectrum.



A defensive approach has lower costs and risks; however, the expected benefits to wholesaler-distributors are also relatively low. An offensive approach, on the other hand, may provide an opportunity for wholesaler-distributors to realize significantly higher benefits as described in Figure 3.

### Defensive-driven Benefits

A defensive approach entails adopting an RFID solution that simply meets customer requirements. With this approach, a wholesaler-distributor need not invest in extensive technology integration or business process reengineering. This tact is conservative and cautious, offering a few basic benefits:

- Meeting customer compliance requirements to preserve business revenue
- Protecting market share from competitive threats
- Minimizing financial, time and labor investments

The defensive solution is functional, but the full potential of RFID cannot be captured because it does not integrate RFID data into enterprise technology or business processes. As a result, wholesaler-distributors will probably not attain benefits such as reduced operating costs, improved asset utilization or increased revenue. The motivation behind a defensive solution is to maintain status quo – preserving key customers and protecting market share.

A basic, defensive approach does not come without risks: Will some wholesale distribution suppliers see the promise of RFID and seek out a logistics partner who can provide a fully integrated solution? Will innovative competitors, such as 3PL providers, use RFID to gain control of the supply chain? Will customers demand functionality, operational efficiencies and service improvements enabled by RFID?

### Offensive-driven Benefits

Since an offensive approach is more strategic in nature, it must be supported by technology integration and business process reengineering. An offensive solution will position a company to capture long-term RFID-enabled benefits, including:

- Gaining operational efficiencies and driving out supply chain costs
- Building the wholesale distribution value proposition to meet marketplace needs, grow revenues and capture market share
- Improving utilization of assets and facilities

The first benefit, gaining RFID-enabled efficiencies, can help wholesaler-distributors maintain competitive advantage by providing customers and suppliers with low-cost, value-added solutions. New levels of automation and accuracy will significantly reduce supply chain costs through improvements in cycle times, labor expenditures and inventory levels. (Table 4 provides a summary of warehouse processes impacted by RFID.)

The second benefit, using RFID to enhance the value proposition, can translate into additional fee-based services. Increasingly, the customers and suppliers who need RFID as a prerequisite for doing business are looking favorably upon outsourced tagging solutions. Others, however, will want to see how RFID, when bundled with existing wholesale distribution services, can create value.

For example, as the use of online self-service by customers grows, wholesaler-distributors must ensure that the right products and services are available at the best prices. RFID technology will help companies achieve this objective by providing up-to-date, accurate information. Ultimately, this can enable wholesaler-distributors to differentiate themselves through unparalleled, real-time inventory visibility.

As a result of refining their value propositions to suppliers and customers through improved business processes and enabling RFID technology, WD may be more able to enter new market segments where they were previously unable to participate. Redefining the value proposition can enable wholesaler-distributors to enter new segments where they may have been previously unable to participate.

The third benefit involves non-inventory applications of RFID. Surprisingly, the buildings, mechanical systems and equipment used by wholesaler-distributors can all take advantage of this technology. The following examples illustrate how RFID can be used to optimize many of the activities associated with facility maintenance, asset management and human access:

- RFID tags are being used to store a wide variety of data, such as the date upon which equipment or a specific part was installed or repaired; the location where the maintenance took place; the identity of the person who completed the work; and the dates and types of subsequent inspections performed.

- RFID is replacing or improving outmoded or unreliable security options, such as closed circuit television (CCTV). This application is particularly useful for operations that span large, unenclosed areas. RFID and CCTV can be designed to work together by setting up the cameras to automatically take pictures when an RFID tagged item is moved in or out of a designated area.
- RFID tags are being used on equipment, such as forklifts, to provide information that helps managers comply with regulations while ensuring the safety of employees.
- RFID solutions are being used to monitor equipment and to control access, grant temporary status, and ensure authorization to remote facilities or multiple areas inside a single building.

**Table 4. RFID-Enabled Operations Benefits and Characteristics**

Warehouse Process	In today's barcode environment...	In an RFID environment...
Receiving	Most warehouses require manual scanning and/or random audits of incoming shipments	Dock door readers automatically read RFID tags attached to pallets, cases, and/or individual SKUs/items
Put-away	Frequently requires manual scanning of pallet license plates and/or desired put-away locations and, in some instances, requires paper documentation	Forklift readers and RFID tagged locations are employed
Picking	Manual scanning or data entry is normally required of each pick location, the pallet or case being picked and, in some instances, the drop location	Cases and/or pallets are read automatically as they are picked
Loading and Shipping	Manual scanning followed by frequent load audits characterizes the shipping process	Dock door readers verify that the correct item is loaded against the open ship order as pallets and cases are loaded onto the delivery truck
Inventory Control and Storage	Perpetual inventory accuracy is achieved via rigorous physical count and/or cycle count processes	Regularly scheduled physicals and cycle counts to verify perpetual inventory system records can be reduced or eliminated
Logistics / Transportation	Despite improved shipping accuracy levels of 98%+ in some instances, the detailed data necessary to determine the root cause of inventory leakage is unavailable	Unique product data will enable suppliers and customers to reconcile actual shipments to actual receipts



# Challenges and Risks

A number of challenges are currently hindering widespread adoption of RFID in the marketplace. These challenges can pose significant risks to wholesaler-distributors as they consider RFID adoption. In order to develop successful mitigation strategies, all three types of these obstacles – economic, technical and implementation – must be carefully examined.

## Economic Challenges

For many companies, the cost of tags and supporting RFID equipment (e.g. readers, encoders, and IT hardware) remains a barrier to adoption. At present, tags are far more expensive than barcodes. However, growing demand is expected to bring costs down from the current 30-80 cents per passive tag to an estimated 5-15 cents per tag over the next four years.

As the cost of tags declines, wholesaler-distributors will likely experience growing pressure from their customers and suppliers to comply with RFID mandates. In addition, the percentage of RFID-tagged product flowing through their networks will increase. As this happens, the need to implement infrastructure to provide data and information to customers will intensify.

Initially, it can be difficult for companies to view RFID favorably due to the potential strain of aggressive mandates. As a result, suppliers and distributors have focused their attention on basic compliance and adopted “slap & ship” solutions as a short-term tactic. (See Figure 4.) The long-term challenge, however, involves determining whether or not downstream, internal RFID initiatives can generate adequate ROI to warrant moving beyond basic compliance or security requirements.

To determine if and when to invest in RFID, companies should develop a thorough business case that assesses all of the downstream benefits. These benefits include the ability to provide new services to customers; visibility of inventory as it moves from the manufacturer through the wholesaler-distributor’s network; and maintaining or growing revenue with key customers that are mandating use of RFID (e.g., US Department of Defense). Wholesaler-distributors who do not

conduct a comprehensive business case could fall behind their competitors, as customers and suppliers increasingly select wholesaler-distributors based on their ability to add value as opposed to their ability to provide the lowest cost.

## Technical Challenges

Several technical issues surrounding the RFID marketplace also pose challenges. While industry and government mandates are driving change, the marketplace for RFID technologies still remains noisy and immature. Advances have been made in hardware, but the marketplace is still in the early stages of development. The ability of many middleware systems to process tag data and interconnect efficiently to legacy systems without significant effort remains unproven. Furthermore, standards need to be established around Electronic Product Codes (EPC), which are used by RFID. While these standards are coming closer to reality through the efforts of several well-known oversight organizations, they remain an unresolved topic, with suppliers and customers, at present, being forced to choose one standard over another. These issues will be magnified as wholesaler-distributors are presented with the challenge of meeting multiple customer mandates.

In addition, the RFID vendor landscape is still evolving. Many mid-size and small vendors are likely to consolidate in the next few years or simply go out of business. Big technology players have recently purchased some small, but visible, RFID vendors in an effort to dominate this evolving technology. This behavior will likely continue to increase until a few key players remain.

Wholesaler-distributors will need to carefully select their technology partners to ensure ongoing capabilities for the future. This means that companies will need to objectively perform due diligence, examining vendors’ financial viability as well as their technological strengths. As market consolidation occurs, companies must reassess their vendor and technology selections to ensure extendibility of their RFID architectures.

## Implementation Challenges

RFID implementations can be complex, touching multiple points across the enterprise as well as throughout the supply chain. Implementation risks can be mitigated, however, through proper planning and by building upon best practices.

Much of the implementation complexity arises because RFID generates substantial volumes of data requiring filtering, aggregation and analysis. In addition to the challenges of synchronizing data with existing systems, wholesale distribution customers will eventually demand access to this information. Consequently, customers, distributors and suppliers will need to redesign their information-sharing and data management processes and policies. They will also need to further integrate their systems to facilitate data exchange.

**Figure 4. What Might Slap and Ship Look Like**



1. Depending on a company's product flow and distribution network, Slap and Ship could involve manually breaking down pallets for an RFID-mandating customer.
2. Applying RFID labels to the cases.
3. Verifying the readability of the cases, reassembling the pallet, accurately scanning the pallet by an RFID reader.
4. Composing the ASN (advanced shipping notice), and then shipping to the customer. It may involve running duplicate inventory data-capture technologies: bar codes and RFID.

Thus, a wholesaler-distributor must assess its existing infrastructure not only for its ability to integrate and utilize RFID-generated information, but also for its ability to accommodate future technology evolution (e.g. system flexibility, scalability, etc.). Also, a company's RFID solution should be designed as an integral part of its existing enterprise applications portfolio in order to extract maximum benefit from an RFID deployment.

The physical attributes of a wholesaler-distributor's environment combined with the nature of radio frequency technology also contribute to the complexity of RFID implementations. Several examples of physical challenges are listed in Table 5. Engineering best practices can remedy all of these challenges; however, expertise to do so is limited in today's marketplace.

Another attribute of RFID implementations that creates risk is the technology's pervasive impact throughout the organization. RFID implementations must be accompanied by appropriate changes in business processes in order to reduce costs, increase revenue, optimize asset utilization and enhance safety and quality. This includes the redesign of basic supply chain processes and alteration of supporting tasks and functions such as goods receiving, warehousing, inventory tracking and direct-store delivery.

Employees at many levels of an organization will be required to adjust and learn new skills. As a result, an effective change management program must accompany any RFID initiative. Active management of communications, training, commitment-building, performance measurement and overall change leadership is just as important to a project's success as the implementation of the technology itself.

Companies face additional RFID implementation challenges related to the present shortage of available RFID skills. As a result of this scarcity, companies must make an extraordinary commitment to retraining their staff members and be retaining outside expertise when necessary to meet their objectives and to complete projects within the desired timeframes.

**The Greatest Risk**

Despite these concerns, the greatest risk associated with RFID implementations is to do nothing. Although some wholesaler-distributors may not need to adopt the technology right away, others must move quickly. Wholesaler-distributors need to clearly understand how this technology can affect their businesses, what the benefits and costs are, and whether or not they are currently under a mandate. Ignoring this technology could cause existing customers to switch to other wholesaler-distributors – or even worse – to jump to new types of competitors, such as 3PLs, that are beginning to provide value-added services.

**Table 5. RFID Physical Challenges**

Reader Collision	Occurs when multiple readers in a warehouse attempt to read the same tag at the same time.
Tag Collision	Occurs when one reader receives signals that have reflected back from multiple tags at the same time. This confuses the reader because it cannot distinguish between the tags.
Signal Interference and Noise	Occurs when ambient warehouse conditions distort the electromagnetic signals sent by the tag and/or reader.
Inconsistent Data	Occurs within the warehouse when readers at different points along the supply chain receive inconsistent information from the same tag.

# The Path Forward

Each wholesaler-distributor must evaluate and determine the right time – if ever – to embrace RFID. For some wholesaler-distributors, RFID may not be relevant or it may not make sense given the needs of their customers and suppliers. For others, the competitive advantage might be significant, creating a more-urgent need to adopt the technology in order to secure market share and to ward off threats from new entrants or old players with new business models. For others, the mandates provide them with no choice – they must move now.

So the clock is ticking – or is it? Each wholesaler-distributor needs to understand the cross-functional implications, risks and benefits that RFID presents to its individual business. Deloitte has developed a logical approach to assessing whether or not to proceed with an RFID implementation. This approach may be used by any wholesaler-distributor – small or large, regardless of line of trade. It includes three steps that outline and facilitate major decision points:

- Step 1: Determine your Tipping Point – go/no-go
- Step 2: Develop a Business Case – go/no-go
- Step 3: Develop and Align RFID Initiatives with Existing Business Strategy

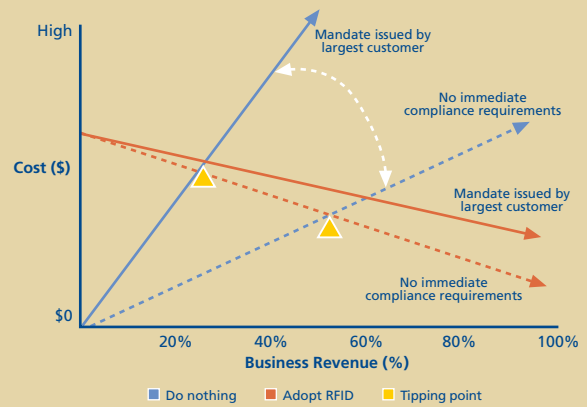
## Determine Your Tipping Point

A tipping point is the juncture at which a company should transition from doing nothing to adopting RFID. As we mentioned earlier, every wholesaler-distributor will have a different timeframe, with some never adopting RFID. For others, the tipping point may be just around the corner.

How do you determine your company's tipping point? Many different drivers and factors should be analyzed, ranging from customer and regulatory mandates to the desire to generate internal efficiencies. These drivers and factors will differ for each wholesaler-distributor based on its business priorities and its short- and long-term objectives.

Also, it is important to remember that a tipping point is not static: It is a moving target that needs to be recalculated every time a driver or factor changes. Initially, a company may identify its tipping point for RFID adoption to be 18 months away, only to have its largest customer issue a mandate requiring RFID data as its products move through the wholesaler-distributor's network. This request may reduce the wholesaler-distributor's tipping point down to six months or even less.

Figure 5. The Tipping Point



This illustration represents how customer mandates may affect the Tipping Point of a wholesaler-distributor that is deciding when to shift from doing nothing with RFID to adopting RFID. In this particular wholesaler-distributor's scenario an RFID mandate issued by their largest customer brings in the Tipping Point – requiring the wholesaler-distributor to implement RFID solutions sooner rather than later. As companies seek to discover their Tipping Point, other drivers and variables should be considered. Deloitte's proprietary tools can help companies to quickly evaluate their own situation against these multiple variables, ultimately honing in on their Tipping Point.

Similarly, a change in strategic direction will affect the tipping point. For example, if a wholesaler-distributor makes a decision to start providing services to the DoD this may create an immediate need for RFID. Nonetheless, the cost of the implementation may be offset by the profit from this new customer. Clearly, each wholesaler-distributor's tipping point, as well as the factors and drivers used in calculating it, are unique. See Tipping Point illustration (Figure 5) for additional information.

## Background of the Tipping Point Concept

In 2000, author Malcolm Gladwell wrote a book entitled *The Tipping Point* that examines the tipping point of social epidemics, but suggests this concept is applicable to business, social policy, and advertising. As Gladwell points out, the concept of the tipping point was initially used in epidemiology (the study of diseases) to indicate that small changes to a system will have no effect until a critical mass is reached. At that point, the system "tips" and a large effect is observed: For example, a few scattered incidents of an infectious disease may go unnoticed, but a concentrated outbreak can quickly turn into a public health crisis.

## Develop a Business Case

If a company's tipping-point analysis reveals that it should go forward with some form of RFID adoption, developing a business case is the next logical step. This will enable the wholesaler-distributor to make informed decisions about moving forward and prioritizing objectives.

The following are critical steps in developing an RFID business case:

- Identify supply chain pain points and business issues
- Develop model(s) to quantify the RFID-related improvement opportunity for each pain point and issue
- Analyze the financial cost/benefit impact of each RFID-related opportunity
- Develop a portfolio view of the collective opportunities
- Strategically assess the portfolio to determine overall risks, benefits, costs, and other impacts

These steps will help the wholesaler-distributor to ensure that its RFID transformation efforts support one or more of the primary drivers of shareholder value:

- Increased revenue
- Reduced operating costs
- Optimized asset utilization
- Enhanced quality and risk control

An RFID business case can be further strengthened by considering tax advantages and financing alternatives. These often-overlooked drivers of shareholder value are important components of any RFID evaluation.

Upon completion of the business case, a wholesaler-distributor should be able to answer several important questions: How are value drivers (i.e., revenue, operating costs, asset utilization, and quality/risk control) affected by each initiative? How do the opportunities align with existing or planned enterprise initiatives? What is the overall value of the initiative compared to the ease of implementation? At what point does the interchange between costs and benefits trigger a decision?

Ultimately, the business case will support the development of a roadmap for strategic investment in RFID, providing the wholesaler-distributor with the information required to move forward on project prioritization and timing.

## Develop and Align RFID Initiatives with Existing Business Strategy

Once the business case has been developed, RFID-related opportunities should be assessed from the perspective of business strategy. How does RFID help achieve the company's overall strategy?

Are proposed RFID initiatives driven, for example, by compliance or regulatory requirements affecting a significant sub-set of a wholesaler-distributor's current and/or anticipated customer base? If so, the continued pursuit of an RFID program is clearly warranted.

If, however, the need for RFID compliance is being driven, for example, by a single, less-significant customer mandate, the wholesaler-distributor will need to consider what that customer means to them strategically. Do they account for a significant amount of revenue? Is the revenue expected to increase or decrease over time? Does the customer represent an emerging or high-growth market? Conversely, are they part of a market that is no longer considered to be a high-priority for the company? In this case, the decision whether or not to pursue RFID is not as clear.

### Case Study – US Based Electrical Distribution Company Strategically Weighs RFID

A US based electrical distribution company recently completed a strategic assessment of RFID that was driven by its quickly growing business with the US Department of Defense. Once applicability of the DoD mandate was established, a focused project team assessed several cost factors and benefit drivers that predicted an upcoming tipping point for RFID adoption. The team built a preliminary business case that indicated a neutral-to-positive ROI based on reduced levels of working capital, improved distribution processes and growing revenue with target customers.

The company's next step is to develop and align proposed RFID initiatives with its existing business strategy. The company has already identified several strategic RFID enablers, which include undertaking a focused DoD adoption, leveraging existing IT investments and optimizing supply chain processes. Executive sponsorship, cross-functional participation and dedicated resources have all been critical to the company's success in this initiative.

## Conclusion

Wholesaler-distributors need to clearly understand the relevance of RFID and how and when it will affect their specific businesses. No matter how big or small or what industry segment they serve, every wholesaler-distributor needs to assess RFID and its associated impacts. Do you know your “tipping point”? Ignorance is not an option. Identifying and understanding mandates, how they can transform the supply chain, and how RFID investments can be leveraged to develop new business models and to expand your company's footprint are all prerequisites for succeeding in today's wholesale distribution environment.

### Developing a Pragmatic Approach to RFID in Wholesale Distribution

Deloitte has created a comprehensive methodology and approach to guide wholesaler-distributors through the challenges and opportunities of RFID adoption. From awareness-building and project planning, through implementation, scaling and optimization, this RFID methodology combines Deloitte's consulting, audit, tax, risk management and financial advisory services with its deep experience and understanding of the wholesale distribution marketplace. This dynamic combination enables us to provide a level of service and understanding that no other firm can match.

For instance, Deloitte's tax planning strategies around RFID can often help companies to offset initial project costs and to reduce future, effective tax rates. In addition, we can assist in redefining critical accounting policies and management judgments with respect to revenue recognition, inventory evaluation and shrink. We can also help companies to assess the impacts on key inventory controls in relation to receiving, quality audits, shipping and cycle counting.

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## About NAW

The National Association of Wholesaler-Distributors (NAW) is a federation of 126 international, national, regional, state, and local trade associations representing wholesaler-distributors of virtually every product sold to industrial, contractor, institutional, retail and government customers. NAW's membership comprises approximately 40,000 companies with 150,000 places of business — a significant portion of the nation's \$2.9 trillion-per-year merchant wholesale distribution industry.

NAW is the only national voice for the entire U.S. wholesale distribution industry. The association's government relations program represents the industry before Congress, the White House, and the Judiciary on issues that cross lines of trade, such as health care reform, taxes, product liability reform, business perpetuation, labor/management relations and employee benefits.

In addition to its government relations program, NAW's political arm, the Wholesaler-Distributor Political Action Committee (WDPAC), accepts both personal and corporate contributions to support pro-business candidates for Federal office on a bipartisan basis.

The Distribution Research and Education Foundation (DREF), the long-range research arm of NAW, sponsors basic research into strategic management issues facing wholesaler-distributors and publishes study reports that transcend all lines of trade and affect all wholesaler-distributors.

The NAW Service Corporation (NAW/SC), a wholly-owned subsidiary of NAW, leverages the collective purchasing power of industry firms. NAW/SC offers high quality business programs that are designed to meet the special needs of wholesaler-distributors at favorable prices.