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RFID: How Far, How Fast:

A View From the Rest of the World

The Time For Action is Now

There are two sides to the retail RFID story. Everyone knows about the highly publicized efforts and mandates of Wal-Mart, Target, Tesco, and Metro. The four early retailers traditionally lead the way in retail IT innovation, so it is hardly surprising that they also hold a commanding lead in RFID adoption.

But there is also a lesser known, yet more compelling, side of the retail RFID story. Loosely speaking, it is the untold story of what "the rest of the world" is doing with RFID. In partnership with Deloitte Consulting and ePC Group, Retail Systems Alert Group Inc. is launching a three-year effort to track the adoption curve of RFID within the retail industry as a whole, including CPG companies as well as transportation/logistics providers and distributors. The "RFID: How Far, How Fast: The Rest of the World" survey seeks to establish baseline data on RFID and illustrate the early part of its retail adoption curve.

The survey's key findings illustrate the vast untapped potential of RFID for retail industry participants. Furthermore, by demonstrating the slow but steady movement toward broader RFID adoption and resolution of existing technical and business issues, it will explain why the time has come to get off the bench and into the RFID game.

Retailers and their suppliers will incrementally incorporate RFID and its advantages into their supply chain over the next few years. Our survey, as described in this white paper, shows an optimism for this new tracking technology but also the dangers organizationally and operationally in moving too fast before a full understanding exists. We suggest that retailers view RFID as a business concept that will improve current and next-generation processes as opposed to a new technology that is a silver bullet.

More than 90 global representatives of the retailing, manufacturing, distribution, and transportation/logistics sectors responded to the survey in Q3 2003, providing a snapshot view of RFID development in the industry to that point. Despite changes in the status of RFID that have occurred since the survey was completed, it still serves as a valuable benchmark for where the industry is in its adoption of RFID and where it needs to be.

While there appears to be widespread interest in the potential of RFID technology, the interest also appears to be shallow. Industry members are anxious to get in the pool, but they don't want to dive into the deep end. In addition, expectations of benefits for the next five years vary considerably, although most participants are in the early stages of investment. Many are still defining timelines for deployment and have low levels of 2004 RFID investments.

"Our company has developed a timeline for RFID implementation"
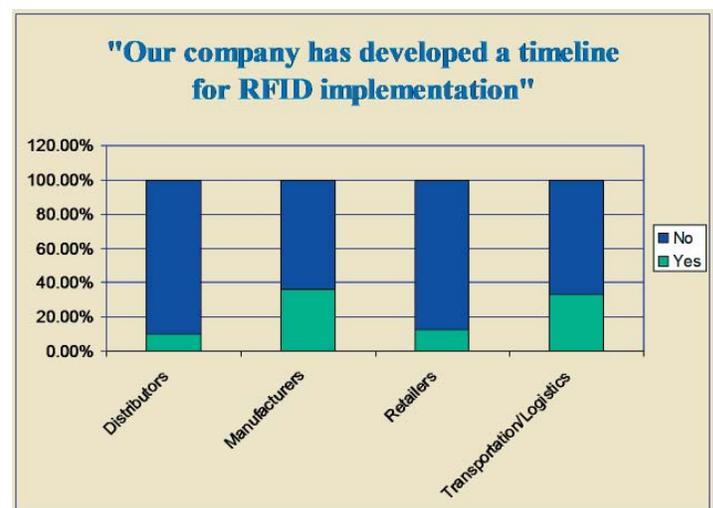
Furthermore, there appears to be widespread skepticism about the extent of the benefits RFID can provide. Why does the retail industry take such a measured approach to RFID? Two main obstacles stand in the way of RFID receiving a more enthusiastic embrace from retailers and their trading partners: 1) technical challenges that primarily relate to tags and 2) cultural and organizational challenges stemming from mistrust of the IT department and general resistance to change and innovation.

The good news is that as has been demonstrated throughout the years, technical challenges almost always work themselves out over time and cultural resistance to new technologies tends to weaken as they become more standardized and widely deployed. This paper will explain why all indicators point toward successful industry resolution of technical and cultural challenges, meaning that the time to wait and see has passed and been replaced by the time to act and do.

Size Provides Advantages, But So Does Planning

A significant percentage of respondents, particularly in the retailer and manufacturer categories, reported annual revenues of more than $5 billion. Considering the expense and resource demands of an RFID pilot, it is logical that larger retailers would be more likely to investigate RFID. In addition, large retailers are capable of driving their suppliers to go along with RFID and large manufacturers are probably part of Wal-Mart's initial call to its top 100 suppliers for RFID compliance.

However, few respondents, even larger companies, have developed a timeline. While 70 percent of respondents indicated they expect to implement RFID in the next 18 months, there has not been much specific planning beyond that. Larger companies have a toe in RFID waters, and others are at earlier stages of evaluation. Total industry RFID activity is underestimated because the major first-movers are excluded.

Although large retailers enjoy certain advantages in deploying RFID, or any new technology, excluding the top performers such as Wal-Mart it appears they have not fully capitalized on these advantages. Although a majority of large retailers will be launching RFID programs within 18 months, they have yet to create the detailed plans needed to successfully execute this type of strategic venture.

Thus a smaller retailer could take advantage of its nimbleness to quickly develop an RFID plan and beat larger competitors to the RFID punch, albeit on a more limited scale. Retailers of any size should keep a close eye on the activities of first movers to ensure that traditional first mover advantage does not grow into an insurmountable gap.

The Importance of Cross-Functional Teams

"RFID, by its nature, touches a wide variety of areas of the enterprise," observes Ed Carey, Global Director of Deloitte's Consumer Business practice. "This means that for companies to fully reap the benefits of RFID, they must involve multiple functions."

While RFID may begin in IT or Operations, it is not an IT or operational initiative alone. Finance, logistics, and distribution will be affected by the technology, and even departments such as HR will need to redesign roles and reward systems based on the new system.

Larger companies are more likely to have created cross-functional teams to develop RFID programs. One large retailer, for example, reported that, "An ad hoc cross-functional team is researching RFID, attending conferences, subscribing to industry magazines and reviewing white papers."
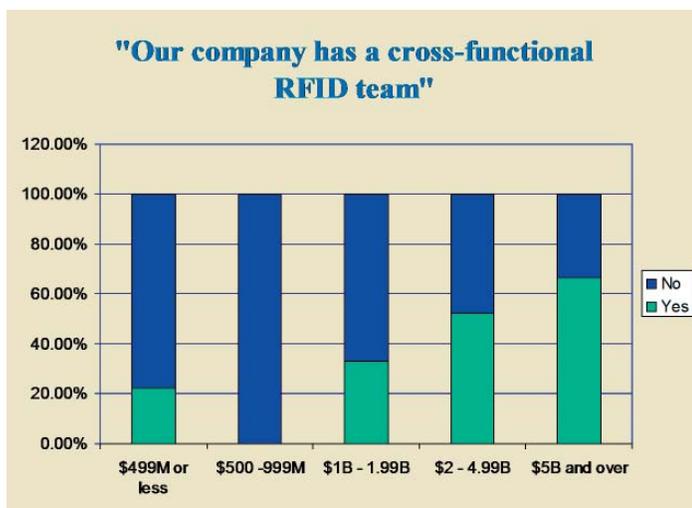
However, smaller companies working on RFID projects probably spread the work across the organization in pockets, with different groups exploring different perspectives of the technology utilizing different charge codes. This may skew reporting of cross-functional teams by smaller companies downward. In any event, regardless of organizational size, establishing a cross-functional team with representation from all areas of the enterprise that will be affected by RFID is crucial to its success.

Needed Funding is on Its Way

In the short span of time since the completion of the "RFID: How Far, How Fast: The Rest of the World" survey, the one facet of retail RFID that has changed more than any other is the amount of money being devoted to RFID projects. A majority of respondents indicated that they allocated less than $500,000 for RFID in 2004.

"Our company has a cross-functional RFID team"

"How much money has your company allocated for RFID in 2004?"
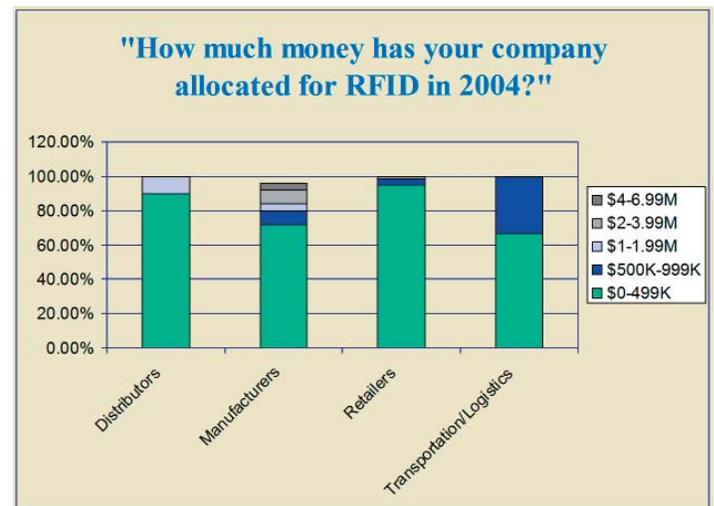
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Furthermore, a substantial majority of respondents, including almost 80 percent of retailers and 100 percent of transportation/logistics providers, believe that they allocated a sufficient amount of money for RFID in 2004. At first glance, this response suggests that with the exception of first movers, the industry is contently settled into a pattern of cursory exploration that will not break any time soon.

However, retail observers should keep in mind that this survey is essentially a snapshot of retail industry participants' plans for RFID in the 2004-2005 timeframe. Most suppliers, who will likely provide the impetus for a large portion of RFID's advancement within retail, only began to consider RFID after Wal-Mart CIO Linda Dillman announced at the June 2003 Retail Systems/VICS Collaborative Commerce Conference that Wal-Mart would require them to be RFID-compliant.

But by the time Wal-Mart CEO Michael Duke clarified the retailer's RFID mandate in November 2003, most suppliers had already allocated their resources for the 2004-2005 fiscal period. It is thus likely that suppliers will be devoting substantially more dollars and effort toward RFID in 2005-2006, which will spur industry-wide development. Increasing this likelihood even further is Wal-Mart's recent mandate for its next top 200 suppliers to become RFID compliant by 2006.

The comments of one mid-sized CPG supplier illustrate the current status of RFID development at many retail industry players. "We are assessing impact on internal business processes and how/when to move beyond 'slap and ship.' There will be very high-level cost impact and potential product testing later in the year in a lab environment to identify readiness status on current product cases and pallet configurations."

Awareness of Standardized RFID Tracking Initiatives Varies

In contrast to the consistent view on RFID funding that exists across respondent categories, awareness of standardized RFID tracking initiatives varies considerably depending on who you ask. While high awareness of these initiatives exists among distributors and manufacturers, retailers have a notably lower level of awareness.
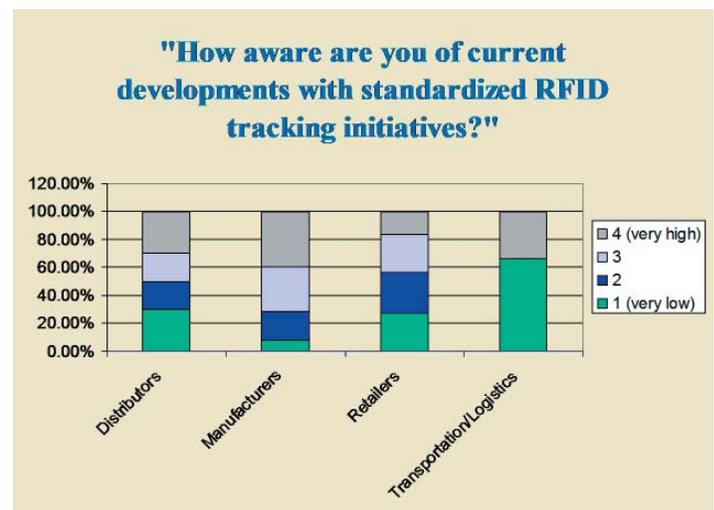

Since tracking is a supply chain activity, the return from tracking initiatives clearly favors manufacturers and distributors. Supply chain losses and shrink totals comprise 6 to 10 percent of product, so it is in the interest of manufacturers to reduce this amount. As one large manufacturer reports, "We are engaged in design and development of pallet- and case-level RFID systems for use in manufacturing and distribution throughout the company. We are evaluating practical real-time use (of RFID) in the factory and shipping environments."

In contrast, when retailers don't have the right products or number of cases, they simply file an invoice deduction, so they are less concerned about supply chain losses.

Industry Optimism Exists

Amidst the uncertainty and hedging that accompanies the arrival of any new technology, some retail industry participants are expressing optimism about the benefits RFID will provide during the next five years. Distributors in particular expect increased revenues from RFID within the first five years of implementation.

Expectations of increased revenue from RFID in first 5 years of implementation (Distributors)
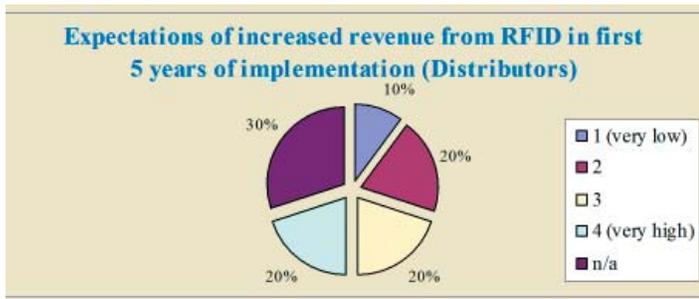
Much of this positive thinking probably results from the opportunity distributors have to provide third-party "slap and ship" services for manufacturers meeting the requirements of major retail trading partners such as Wal-Mart and Target. In addition, until there are large amounts of products to be tagged, distributors can increase revenues by lowering the cost of labor and gaining the ability to ship specific amounts of tagged product to regions where RFID is being rolled out.

However, revenue enhancement opportunities do exist for members of other respondent categories. For example, despite relatively low expectations for overall revenue enhancement within the first five years of RFID implementation, one-third of retailers hold very high or high expectations for quicker order processing and customer payment as a result of RFID. And across all categories, 75 percent of respondents expect a beneficial reduction in human error from RFID.

Expectations of beneficial reduction in human error from RFID in the first 5 years of implementation
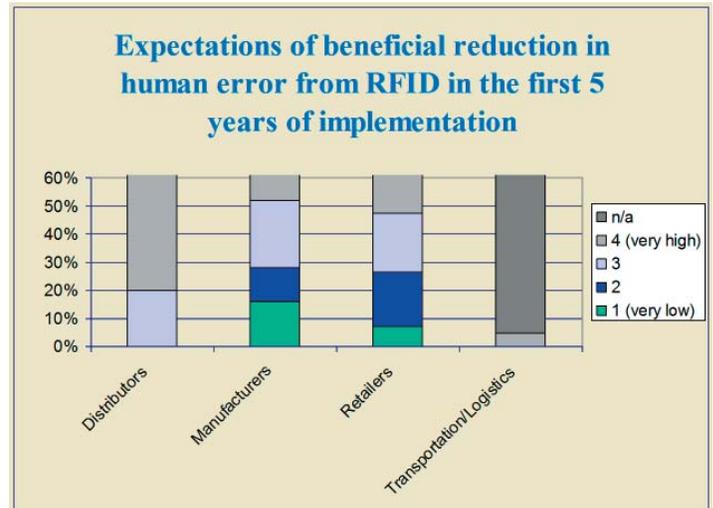
The comments of one small retailer illustrate the types of ROI the industry is anticipating: "We are looking at product identification for receiving, rotation and for production, and also for shelf-edge signage."

Challenges Need to be Met

Of course, the path to widespread RFID adoption is not without obstacles. Retail industry participants face a variety of issues, both technical and cultural, that need to be solved before RFID can develop to its full potential as a driver of business efficiency and profitability.

On the technical side of RFID challenges, a significant percentage of respondents in all four categories reported the inability to find an RFID tag that produces a sufficient read rate. A large number of respondents also had problems affixing tags to products. Specific issues related to affixing tags include having them fall off, be too big for the SKU, or problems resulting from tag glue/adhesive.

In addition, pilots have often not been designed or implemented by RFID experts. For example, the wrong tags have often been used for liquid products, which can interfere with RF waves and require specialized tagging processes.

Furthermore, many retail industry participants have relied on the vendors themselves, who naturally favor their own products, for advice on selecting RFID tags. Success requires having the right adhesives on packaging and proper tag placement. The development of the new Gen2 electronic product code (EPC) standard will also ease tagging efforts.

Other technical problems experienced by some respondents include interference from other RF devices and nearby machinery, disruption to existing product handing and storage procedures, and health/safety issues relating to RFID technology.

"We can't find a tag that produces a sufficient read rate"
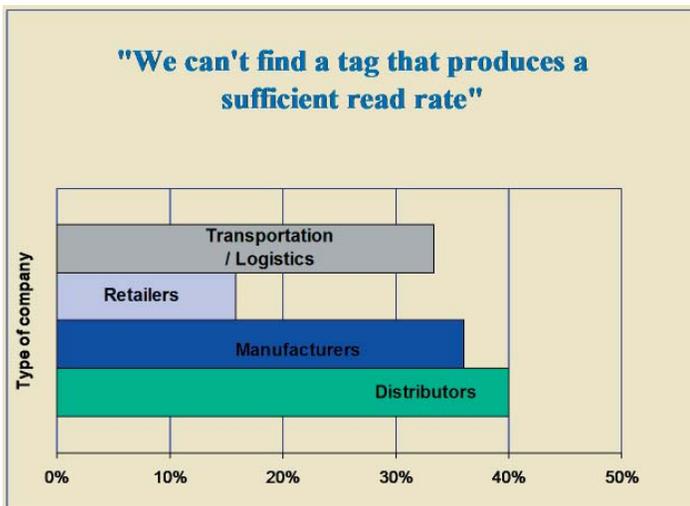
Interference will likely become more of an issue once automatic tagging becomes commonplace. To date, most RFID tagging has been performed through "slap and ship" methods. Having to find a separate area for tagging pallets and cases or rerouting multiple products is an issue for 20 percent of manufacturers and distributors, but this is not an especially large amount.

Health and safety issues seem to primarily affect transportation/logistics providers, but many can be resolved by following existing FCC standards that take RFID tags into account. It will take some more investigation, but health and safety issues are sure to improve as RFID adoption continues to grow.

Despite these significant technical issues, however, the overriding factor impeding RFID adoption in the retail industry is cultural. Almost 15 percent of retail respondents reported internal distrust and animosity toward the IT department, and approximately 30 percent of retail respondents indicated a fear of change within their organizations. Manufacturers and distributors reported similar or even higher frequencies of cultural problems.
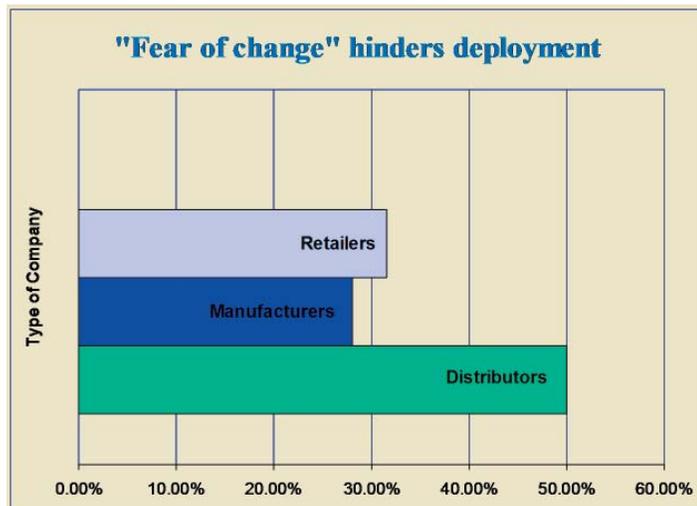
Fear of Change

Fear of change reflects that many companies have one or two internal RFID champions who are not C-level. Most C-level executives do not want to risk their positions by getting involved in RFID or any other new technologies that will significantly change the way their companies do business. This is a severe problem for the retail industry in general.

In addition, distrust of and animosity toward the IT department is likely due to lingering resentment about the Y2K scare and dotcom crash. Many companies spent millions of dollars on Y2K-related programming fixes and various e-commerce programs that proved to be unnecessary at best and flat-out failures at worst. IT executives need to continue working to regain organizational trust and may want to consider breaking widescale RFID rollouts into smaller, more palatable projects.

Another cultural problem that appears in between 20 and 40 percent of all respondent categories is lack of an innovation culture. Simply put, the retail industry is notorious as a group of "fast followers." As one mid-sized retailer responded, "At this time we are just keeping an eye on the progress with the Wal-Mart initiative and the changes in the RFID field."

RFID still lacks global standards or any sort of clear implementation methodology. Retailer reluctance to adopt RFID will not abate until a more formalized system for using RFID technology is developed. Fortunately, Wal-Mart and other larger retail players are actively working with EPCglobal Inc. to develop a global RFID industry standard. In the meantime, forward-thinking retailers and suppliers can help launch grassroots RFID standards efforts that will help tailor RFID systems and processes to their own needs.

Looking Forward

Although RFID has existed in some form since the World War II era, it only emerged as a mainstream technology within retail during the past few years. Thus "growing pains" are to be expected, and there are no current obstacles to industry-wide deployment that cannot be solved with time and effort.

First, dollars budgeted for RFID development do not automatically indicate the full intent of retail industry participants. Resources may be coming in from other parts of the business, and retailers in particular may be counting on vendors and trading partners to shoulder a sizable portion of the final cost.

Certainly technical problems do exist, the primary obstacle to RFID adoption and innovation is cultural. By taking the initiative to educate financial and operational personnel about the true benefits of RFID, IT departments can break down barriers of fear and mistrust, leading to a smoother road for adopting the cutting-edge technologies of tomorrow.

And looking outside of their own organizations, retail industry participants can see more and more examples of RFID's growing usage and acceptance. For example, the US Department of Defense is accelerating rollout of RFID systems, Wal-Mart is expanding the number of suppliers it is bringing on board for RFID compliance, and Target's RFID mandate will likely inspire other large retailers to begin supplier compliance programs of their own that will accelerate the development of RFID throughout the industry as a whole.

According to some industry observers, a new technology must pass through levels of interest, intrigue and commitment before it becomes truly accepted as a mainstream application. The high survey response level indicates that interest definitely exists, and the strong belief that RFID will deliver at least some benefit in the next five years demonstrates intrigue. Commitment is not yet firm, as revealed by the limited dollars that have been allocated to RFID development. However, there is more to the picture than money, and overall the picture is bright.

Anyone who is still uncertain about the wisdom of launching an RFID project should keep in mind that Wal-Mart caught the industry by surprise in 2004, creating an inevitable lag in competitive response. There will be a significant spike in RFID activity during 2005 as retail players get their heads in the game and strive to stay on top of the action. Now is not a good time to sit on the bench!

Retail Systems Alert Group is a global research and events company that has followed the advancements of technology applications within the retail, CPG, and apparel industries for more than a decade. The company provides analysis and insight about a broad spectrum of issues and trends through publications, conferences and expositions, online services, special reports, and customized research. (www.retailsystems.com)

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