

Adoption of RFID by small and medium businesses is critical to the technology's long-term success, but SMBs face unique challenges.

Aug. 7, 2006—The majority of RFID pilot programs in the retail supply chain have explored the benefits of the technology for large businesses. These pilot programs have tested merchandise manufactured by large apparel and consumer packaged goods (CPG) suppliers destined for the distribution centers and stores of large retailers. However, little analysis has been performed regarding the benefits of radio frequency identification technology for small and medium businesses (SMBs). Approximately 80 percent of manufacturers in the retail supply chain are SMBs, and RFID adoption is a critical factor to their long-term success. After all, both large and small suppliers have to face challenges associated with obsolescence, counterfeiting, shrinkage, new product introductions, promotions and out-of-stocks.

In the past two years, a handful of early-adopter SMBs have been recognized for their efforts to embrace RFID proactively for their manufacturing and supply-chain operations, but questions still remain: Will RFID provide the same advantages to SMBs as it does to larger suppliers? How are SMBs responding to the emergence of RFID? How quickly will they leverage these new technologies? What is the current state of readiness of the typical SMB? And with many large businesses still debating the merits of RFID, is it premature to worry about SMBs?



Industry thought leaders continue to debate the timeframes expected for widespread adoption of RFID in the retail supply chain. Aggressive estimates indicate such adoption in as little as two years, while more conservative visions predict a five- to 20-year horizon. If current trends continue, retailers will follow one of two paths for RFID. A handful of very large retailers and technology-savvy midsize retailers will make significant investments in RFID up front, while the remainder will embrace a more conservative approach—tagging only high-value items prone to theft, perishable products with a fixed expiration date or a selected group of fast-moving promotional items.

New economics will make deploying RFID-based systems financially preferable to maintaining existing business processes. The initial result will be a dual operating mode. Enhanced business processes, applications and technologies will be in place for products supplied primarily by large, RFID-enabled companies. Products shipped by non-RFID-enabled suppliers, primarily SMBs, will require the continued use of legacy business processes. Operating in this mixed mode will result in complexity and costs that diminish the ROI of RFID. As a result, retailers will move quickly to encourage 100 percent use of RFID. As adoption levels increase, non-RFID-labeled products will be viewed as exceptions rather than mainstream. Adoption from the broad community of SMB suppliers then becomes vital.

Assessing SMBs' Readiness for RFID

While mass adoption of RFID by SMBs may be several years away, actions taken in the coming years

can lay the groundwork for that future. Currently, many SMBs do not participate in the related data-synchronization and electronic data interchange (EDI) processes necessary for RFID success. Of additional concern is that many pallets and cases originating from SMBs are not serialized or labeled with a bar code.

EDI and Bar-coded Labels

The most common EDI document used to automate receiving is the advance shipment notice (ASN). This is an electronic message sent by a supplier to a retailer's warehouse management system (WMS) with details about a forthcoming shipment, including the order number, delivery address, packaging structure, delivery date and transportation carrier. ASNs are often used in conjunction with standardized bar-coded labels. When goods arrive at a retailer's distribution center, a scanner reads their bar codes and queries the WMS for the associated ASN. The retailer can then access the order details electronically, eliminating the need to inspect the shipment physically. In the future, RFID tags will be substituted for bar-coded labels. However, the need for the ASN to provide associated order details will remain. For SMBs that have already adopted bar-coded labels, the adoption of RFID is simpler, as it is a newer technology replacing an older one, rather than an entire shift in business practice or culture (as required by less technologically advanced SMBs).

Data Synchronization

Data synchronization is another critical, foundational technology necessary to realize the promise of RFID. Data synchronization is a standardized approach for manufacturers to share their product catalogs electronically with retailers. Product catalog data includes marketing, packaging, pricing, promotion, taxation and regulatory information. Most significant to note is that the electronic product code (EPC) utilized in the retail supply chain will be derived from global trade identification numbers (GTINs) supplied by manufacturers during data sync. GTINs highlight the strong link between RFID and data synchronization. If a manufacturer doesn't keep its GTIN list current and accurate, a retailer may not be able to identify an item, case or pallet.

Data synchronization processes also exchange information about the packaging hierarchy, such as the quantity of items per case and cases per pallet. Accurate packaging data is critical for realizing RFID benefits in processes such as store-shelf replenishment.

Leading retailers and larger suppliers have been early adopters of data synchronization, and a growing number of SMBs are beginning to leverage the technology as major retailers of DIY, grocery and general merchandise roll out supplier-enablement programs. However, the majority of SMBs in the retail supply chain today are not evaluating or deploying a data-synchronization strategy.

Business Applications

RFID can generate significant amounts of data about the locations of goods as they flow through the supply chain. The data, if analyzed, can identify supply-chain inefficiencies, expose potential out-of-stocks and pinpoint causes of shrinkage. Both SMBs and large businesses can benefit significantly from the new insights RFID can provide. However, many SMBs are not equipped with the

business intelligence or ERP systems necessary to consume and analyze the data generated by retailer and logistics-provider RFID systems.

While SMBs have not embraced ERP or business-intelligence suites, they have increasingly adopted commercial, off-the-shelf software applications to manage such business processes as accounting, logistics and manufacturing. These applications are lighter versions of ERP, designed for the reduced complexity of the SMB environment. Popular SMB packages include Intuit Quickbooks, Peachtree Pro Accounting and Microsoft Dynamics. A handful of early adopters have already begun to use these packages for RFID, but the majority of businesses have not. The vendors of these solutions need to make their RFID features more robust.

Designing the Ideal SMB RFID Solution

The ideal SMB RFID solution must avoid many of the usual pitfalls technology vendors struggle with in designing technology for SMBs. RFID solutions for small and midsize businesses ideally will offer flexible pricing and packaging and an end-to-end service model, and be able to fit in with an SMB's existing business processes.

Flexible Pricing and Packaging

Many technology vendors design a one-size-fits-all solution for SMBs. However, SMBs can range from home offices with two to three employees to upper mid-market companies with a staff of 999. RFID solutions for SMBs must include a range of prices and deployment options to appeal to different budget constraints and levels of technical expertise. Highly staffed and funded SMB IT organizations may prefer to license and manage software behind the firewall. Organizations with limited IT resources and expertise may prefer a hosted, on-demand service, while others may opt for a completely outsourced solution from third-party logistics providers.

End-to-End Service Model

Many technology vendors assume the key to success in the SMB market is inexpensive pricing. While this is a key factor, SMBs are equally concerned about the ease of use, the management effort required and the availability of technical support. Solution providers for SMBs should deliver an end-to-end service offering in addition to the relevant printers, scanners, middleware and label-generation software. Following the sale, solution providers will need to provide device installation and configuration; end-user documentation and training; and retailer testing and certification. Post-implementation services should include both on-site and remote technical support, emergency hardware break-fix and regular technology upgrade or refresh.

Fit with Existing Business Processes

The ability to integrate RFID and B2B e-commerce technologies directly with lighter ERP applications popular among SMBs such as Intuit Quickbooks and Microsoft Dynamics will greatly simplify adoption. Consequently, minimal changes to business processes would be required, as RFID-enabled supply chain activities can be managed in the existing application. Minimal training would be needed for end-users already accustomed to working with the software.

SMB RFID Solution Examples

Having thus defined the criteria for successful solutions, here are two potential RFID solutions for SMBs:

Warehouse Shipping Solution

This is a slap-and-ship solution designed for SMBs seeking to meet a large retailer's RFID mandate. An SMB supplier benefits from the use of RFID through reduced out-of-stocks at the retail location. A package might include a printer from [Zebra](#), a handheld reader from [Symbol](#) or a fixed reader from [Alien](#), as well as an RFID-shipping application that self-installs on any Windows-based PC. The software provides integrated support and preconfigured templates for EDI, data synchronization and labeling for such key retailers as [Wal-Mart](#), [Target](#), [Best Buy](#) and [Albertsons](#). The application is user-friendly, offering wizards to configure hardware devices automatically and connect to related business applications such as Intuit Quickbooks or Microsoft Dynamics.

To prepare a shipment, the system guides the user through a series of prompts. The operator keys the customer name, ship-to location, buyer's order number, transportation provider, bill-of-lading number and other information about the order directly into the application, or retrieves it from the relevant business application. Next, that person selects the products to be shipped. If the product is new or its packaging has changed, the system prompts the user to key in the appropriate item attributes. The system shares the updated product information with the retailer through 1SYNC data synchronization services, prints a shipment label with an UCC-128 industry-standard bar code and human-readable text and encodes the label's embedded RFID tag. The label is then applied to a pallet of goods to be delivered to the retailer.

As the shipment passes through the SMB's loading-dock door, a fixed reader identifies the pallet based upon the RFID tag. The read event triggers the creation of an electronic ASN, which the system transmits via EDI to the retailer. On-site installation of the RFID system, supplier certification and end-user training programs are available as up-front options. On-site, Web and phone-based technical support are available to the SMB for troubleshooting hardware or software problems. A 24-hour fix-or-replace program ensures continuity of operations, even in the event of a hardware failure.

Supply Chain Planning Solution

The second solution is a hosted, on-demand application for SMBs to analyze RFID data. The SMB can use the data to identify supply-chain inefficiencies, expose potential out-of-stocks and pinpoint causes of shrinkage. Instead of sending large files of RFID-related data to the SMB, retailers and logistics providers relay the information to a third-party on-demand service provider. The system parses the data for the customer and organizes it into meaningful reports for presentation via an on-line Web portal. The SMB pays only a monthly subscription fee to access the reports, with no additional software requirements.

The application provides a visual model of physical goods flowing through the supply chain. End-users

click on icons representing distribution centers, transportation hubs and store locations to access more detailed information, such as throughput times and inventory levels. The system easily identifies and highlights supply-chain bottlenecks, enabling the redesign of distribution processes or replacement of underperforming transportation providers. Store-level RFID data provides insights into the SMB's marketing and sales personnel, while visibility to store-level RFID data offer the SMB insight regarding the root causes of out-of-stocks. In addition, the locations of cases and pallets of goods can be monitored for time-sensitive merchandise such as new-product introductions or promotions, enabling the SMB to work with the retailers to take corrective action.

Conclusion

Adoption of RFID by SMBs is a critical factor in the long-term success of RFID in the retail industry as a whole, yet many SMBs are not aware of the steps and precursors required for successful implementation and use. With so much focus on success factors for larger companies, SMBs are often left in the dark. Foundational elements such as EDI and bar-code labeling, data synchronization and business intelligence systems serve as steps and guidelines for SMBs seeking RFID success.

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