

RFID: the supply chain's greatest evolutionary step

As retailer demand for RFID rapidly increases, it's gaining visibility in the marketplace: Target, Sam's Club and many other retail giants are stipulating that manufacturers include RFID tags on their products, and manufacturers of all sizes are taking notice. The bar code is still in use at checkout, but RFID tags ride alongside or are combined with bar codes to deliver better inventory visibility and fewer stock-outs, as well as increased security and shrinkage reductions of up to 10%. For retailers, those are impressive gains...especially considering that all they need to do is make a small investment in RFID readers and put the squeeze on manufacturers.

Manufacturing efficiencies

But things have begun to change for manufacturers as well. Jorma Lalla, CEO of Salo, Finland-based RFID handset manufacturer Nordic ID, is finding that manufacturers are now beginning to employ RFID in their own processes to create internal efficiencies, notably with custom manufacturing. "One of the greatest gains with RFID in manufacturing comes with component tracking. Automated processes can apply an RFID tag to a component that informs a fixed RFID reader what combination of other components must be added to end up with a finished product. In this way, products can be custom-built with less error, and assembly can involve more automation, saving cost."

How it works

While bar codes identify products or components at the item class level, RFID tags can store great quantities of information specific to the individual item including serial number, point of origin, and details of its journey from manufacture (or harvest) to point of purchase or use. And since tags don't require line of sight to function, readers can be installed in ceilings and floors. What's more, ultra-high frequency (UHF) tags can be read up to distances of 8 metres or more. So in many applications, every item in each box on every pallet can be automatically scanned and entered into an inventory system as it is wheeled from trailer to warehouse. RFID tags come in read-only and read/write formats, the latter allowing some or all information to be erased and new information added. With this kind of tag, you could scan a packet of fish fillets and see where and when they were processed, when they were put on a truck, how long they spent there, and what their



temperature was at every point along their journey. Tags can be as small as a grain of wheat or as large as a brick. They can be weather, acid and shock-resistant, or small and pliable enough to form part of an adhesive label. They can be passive, requiring the energy from a reader to release data, or active, including a battery that enables them to broadcast. Tag prices are falling, but can range from a few cents to tens of dollars, depending on specifications.

What about standards?

There are so many options in terms of tags; it might look like a standardization nightmare. Not so, says Professor Kary Främling of the Business Information and Technology Research Centre at Aalto University in Finland. "Today, there are standards for item management, logistics containers, fare cards, animal identification, tire and wheel identification, and many other uses. For supply chain management applications, we're nine tenths of the way there when it comes to standardization."

The International Standards Organization (ISO) and EPCglobal regulate RFID standards most relevant for the supply chain. Of notable popularity is EPCglobal's Gen 2 standard, which facilitates the use of Electronic Product Code™ (EPC) numbers that provide both RFID technical specifications and a numbering system for unambiguous identification, especially useful in processes when RFID readers are not involved at every step.

Superior tracking

Professor Främling first tested the robustness and functionality of RFID tags in a 2001 research project: tracking power plant parts through their journey from Scandinavia to South America. Working in conjunction with Kvaerner Pulping, a Finnish power plant manufacturer then a part of the Norwegian industrial service provider Aker Kvaerner, Främling's team made use of RFID tags—barcodes being too fragile for this application—to ensure that the thousands of component parts were accounted for when hundreds of workers showed up to put the plant together. "It was a very successful real life experiment using an emerging technology," says Främling. "Not only were we able to quickly reconcile all parts against the manifest, but the project were able to continuously trace all tagged parts over the course of the project. And since the RFID middleware developed for the project was connected to Kvaerner Pulping's existing project management software, changes in the project and shipment schedules could be detected early on and reacted to proactively."



Supply chain efficiencies

Manufacturers and retailers certainly gain internal efficiencies from RFID technology, but the supply chain is where all parties can realize serious returns. In fact, the advent of RFID might be the greatest evolutionary step in supply chain management. "You can imagine the efficiencies in the supply chain," says Lalla. "Cycle times, returns...you can tell how long a product or component took at each stage, what its journey was, and where it ended up. This is incredible visibility, giving manufacturers, logistics companies and retailers the rich data they need to streamline processes for maximum efficiency." It also helps to track assets better, for less shrinkage. "Goods are less apt to disappear mysteriously when there is visibility all along the journey," continues Lalla. "In terms of asset tracking, RFID can tell you where everything is at any given time."

At Finnish vehicle Terminal Assistor, Nordic ID RFID handhelds are used to speed up handling processes, and improve the accuracy and efficiency of their overall operations.

Assistor, a provider of complete logistics for vehicles and spare parts to the Baltic region, sees around 350,000 vehicles move through their facilities yearly. Prior to implementing the mobile RFID system, Assistor utilized a time consuming bar-code and paper-based tracking system to process vehicles. Given the sheer volume of vehicles being handled, the system was prone to errors and inaccuracies, and simply unfit to meet their growing volume of operations and service offerings.

With the mobile RFID system in place, every car entering the terminal has a passive UHF RFID Gen2 tag affixed to its rear view mirror. When a vehicle is transferred during the handling process, information is updated to the ERP system with a quick scan of the RFID tag. The PL3000 links to the back-end system via WLAN or GPRS to allow efficient real-time tracking of operations

Having implemented a system that accurately identifies and tracks their vehicles throughout the processing cycle, Assistor is experiencing a number of significant benefits. For instance, time for processing has been reduced and most importantly errors have been virtually eliminated. What's more, they are able to handle more cars with the same amount of personnel and a reduced margin of error.

The next evolution: ERP

RFID has proven its worth in the field and is making great inroads in the marketplace. "The real challenge with RFID," says Främling, "is not in the plant or the warehouse, but with organizations' back-end enterprise resource planning (ERP) systems. When companies start using RFID tags in the supply chain, it forces us to



rationalize information, rethink its use and the automated processes that result.” Current ERP systems were not initially designed for identifying individual items, just aggregate quantities. This is problematic, says Främling, because with the traditional ERP model, much of the useful information inherent with RFID technology goes unused. “RFID is going to force organizations to rethink how they go about managing information and how they address the supply chain. It’s forcing a change in the design and use of ERP systems that needs to happen sooner rather than later to create the kinds of efficiencies possible with the rich information that RFID provides. It is starting to happen now, but it’s early days.”

Jorma Lalla is CEO of Nordic ID, a leading manufacturer of handsets for mobile data collection based in Salo, Finland’s Silicon Valley and home to mobile phone giant Nokia.

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