



Cost, security benefits sought in test of transatlantic supply chain using RFID

Overview

Country: Germany, United States

Industry: Supply chain management

Customer Profile

A consortium of suppliers and users are collaborating on the world's first field test of a transatlantic supply chain using RFID technology.

Business Situation

The line-of-sight requirement in barcode technology poses drawbacks for the supply chain, including equipment and human-resources costs; the difficulty of lower-level tracking; and the risk of barcode loss or theft.

Solution

High-end industrial printers are being shipped from a manufacturing site in Germany to a distribution center in New Jersey with tracking provided by RFID technology instead of barcodes.

Benefits

- Reduced costs
- Higher-quality tracking
- More comprehensive information
- Synchronized supply chain

“We want to determine how RFID technology can help to secure the transmission of goods along the entire supply chain.

Thomas Engel, Chief Information Officer, Kuehne+Nagel

A team of suppliers and users are collaborating on the world's first field test of a transatlantic supply chain using RFID (Radio Frequency Identification) technology. The project, which will transport high-end printers from a manufacturing site in Germany to a distribution site in New Jersey, is expected to demonstrate the benefits of RFID technology over barcode technology. Such benefits include reduced costs; more comprehensive, timely, and accurate information; and a higher level of security.

In this project and others, the Microsoft® .NET Framework, Web services, and other Microsoft products and technologies are providing a foundation for the development and deployment of RFID technology.

“With RFID technology there’s no need for warehouse staff to point a reader at anything or even to be sure that containers, pallets, or cases are lined up a certain way.”

Marc Linster
Chief Technology Officer
Avicon

Situation

The use of a radio transmitter as a tagging medium, also known as RFID technology, has been in existence since the 1970s, but only since the 2000s has the hardware technology been feasible from a cost standpoint to make RFID practical in large-scale applications. In recent years, RFID technology has been used increasingly in industries ranging from manufacturing and retailing to law enforcement and entertainment, and is starting to be applied in the industry with perhaps the most potential for its use: supply chain management.

In supply chain management, RFID technology may provide an ideal way of addressing the limitations inherent in the line-of-sight requirement of barcode technology. This requirement means that barcode labels and readers must be aligned properly and without physical obstructions between them. This poses costs in terms of warehouse and equipment design and the need for human intervention as goods are transported through numerous nodes in the supply chain.

The line-of-sight requirement also means that barcode labels must be located on the outside of whatever they are identifying, making lower-level tracking highly impractical. Containers can be tracked at the dock, and pallets at the warehouse, but cartons and cases, not to mention individual products, are next to impossible to track until they reach the distributor or retailer. Locating barcode labels on the outside of a container, pallet, case, or product also poses a security risk, because the labels are vulnerable to damage, removal, or counterfeiting.

Solution

To understand how RFID technology might address the limitations of barcode technology, a German-based consortium of suppliers and users have launched a pilot project implementing the first fully EPC-compliant field test of RFID technology in a transatlantic supply chain. Known as the Laurel Project, its participants include Océ N.V., a Netherlands-based manufacturer of industrial printing systems; Kuehne+Nagel AG, a Hamburg-based provider of shipping logistics; Avicon, a Massachusetts-based provider of RFID software running on Microsoft® Windows® Server 2003; and Lufthansa Cargo.

In the pilot, ultra-high-speed commercial-grade printers and accessory kits are traveling from an Océ manufacturing site outside of Munich, to the Kuehne+Nagel warehouse at the Munich airport, to the Lufthansa Cargo warehouses at the Munich and JFK airports, respectively, and ultimately to an Océ distribution center in Mount Laurel, New Jersey.

Kuehne+Nagel Chief Information Officer Thomas Engel summarizes the objectives of the Laurel Project: “We want to determine how RFID technology can help to secure the transmission of goods along the entire supply chain, to use open system standards, to expedite warehouse inbound and outbound processes, and to improve exception handling.”

On that first point, securing the transmission of goods, Océ Shipping Center Executive Director Gerald Fuchs elaborates: “We are seeking greater transparency in the supply chain and ultimately 100 percent continuity of information over our outgoing products, including spare parts.”

“We consider Microsoft’s commitment to be a serious one. This is because the company is working hard not just to drive the technology but also to understand the needs of the customers and to drive the solutions that will benefit them.”

Silke Lehnhardt
Senior Vice President and CIO
Lufthansa Cargo

Benefits

Lower Cost, Higher Quality

Avicon Chief Technology Officer Marc Linster explains that by eliminating the line-of-sight requirement that comes with barcode technology, RFID technology can provide major cost and tracking advantages. “With RFID technology there’s no need for warehouse staff to point a reader at anything or even to be sure that containers, pallets, or cases are lined up a certain way,” Linster says. “As long as the reader and the tags are within a certain proximity, the information will get through. This makes the gathering of information so much less costly that it can be done more frequently throughout the supply chain, boosting its accuracy, timeliness, and quality.”

Just as RFID technology can raise the quality of tracking by lowering warehouse costs, it can lower overall costs by raising the quality of tracking. “With RFID we hope to deliver more reliable information about the location of goods so our customers—and their customers—can streamline order management and thereby reduce inventory and the costs that go with it,” Linster adds.

Reliable, Comprehensive Information

Besides being reliable, the information available through RFID technology can be very comprehensive, Engel says. “One advantage is that barcodes are only a key to data stored at a given location, but RFID carries the data with the product,” he says. “This can expedite the delivery of a range of vital information, including what the product is, what kind of consignment is involved, its cost, its origin and destination, its environmental requirements for shipping, duties, safety concerns, and much more.”

The information can be kept up-to-date as well, notes Lufthansa Cargo Senior Vice President and CIO Silke Lehnhardt. “A big advantage of RFID technology over barcodes is that the information that comes with goods being transported is dynamic,” she says. “With integrated systems in place, it’s relatively easy for an authorized entity to update information in an RFID tag without its having to be replaced or handled at all.”

Such reliable, comprehensive, and up-to-date information is essential to what Olaf Mossakowski, Industry Manager on Retail and Logistics for Microsoft Germany, calls the “transparent, synchronized, and fully automated supply chain” that RFID technology can provide. “A container, pallet, case, or product that is tagged with RFID has a unique ID that can be followed throughout the supply chain, from start to finish, without the need for human involvement,” he says. “This represents an enormous advantage over current practices.”

Linster concurs. “Because RFID can provide tracking from the container level all the way down to the product level, it can provide exactly the information needed at any given node in the supply chain,” he points out. “The freight forwarder, for example, can use RFID to identify containers or pallets. The distributor can use RFID to identify cartons or cases. The retailer can use RFID to identify individual SKUs or products.” RFID technology is “horizontally granular” as well, uniquely identifying identical-looking boxes, for example, to indicate in which box a given product is located.

Security Advantages, Too

As Kuehne+Nagel IT Project Manager Oliver Muhr explains, this advantage of RFID technology—its ability to provide

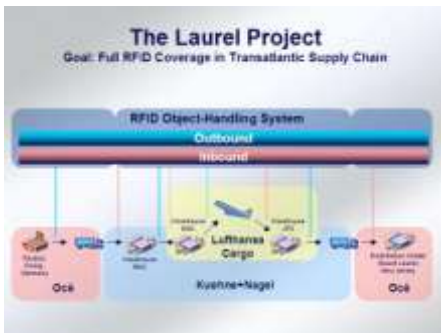


Figure 1: The Laurel Project route.

information about every subcategory of a shipment—goes back to its ability of being placed inside a given product, carton, case, pallet, or container. This touches on the issue of security as well. “Unlike barcode labels, RFID tags need never be visible on the outside of a box or packaging,” he explains. “Not only is there is less risk of misplacement or removal, but RFID tags can be far more effective than barcodes against potential product theft by setting off a silent alarm, for example, when goods are moved without authorization from a warehouse.”

A related security advantage is RFID’s resistance to counterfeiting. “It’s a lot more difficult to duplicate the information in an RFID tag than to photocopy a barcode label,” Muhr points out.

The Role of Microsoft in RFID Technology

In the Laurel Project, as in any large-scale supply chain operation, data must be read and processed by systems residing at multiple and diverse nodes in the chain. This makes the ability to integrate, says Linster, perhaps the most essential element of any RFID technology solution—and the ability to integrate depends on open, standardized, and non-proprietary systems. Which in turn makes the Microsoft .NET Framework an excellent development platform for RFID technology solutions, he adds.

“The Microsoft .NET Framework is universally available and easy to manage; it fits well into our customers’ environment; it meets our needs for performance, reliability, and scalability; and it helps us to build solutions that integrate very, very easily with legacy systems,” Linster says.

In fact, a number of businesses including hardware vendors, supply chain execution retail systems, and service providers have

been using the Microsoft .NET Framework and other Microsoft technologies to build solutions supporting RFID. These technologies include Microsoft .NET Framework and other Microsoft technologies, including Microsoft® Windows Server 2003, Microsoft Windows CE, SQL Server™, and Microsoft BizTalk® Server for collection, management, and integration of RFID data. These businesses also are working with Microsoft Visual Studio® .NET and Web Services Enhancements for Microsoft .NET (WSE) to create Web services-enabled RFID solutions.

In parallel, Microsoft Business Solutions is working with RFID suppliers and users to extend the capabilities of financial management and supply chain management solutions for small and midsize businesses. Microsoft also has joined EPCglobal, an organization that is leading the development of industry-driven standards for the Electronic Product Code (EPC) Network to support the use of RFID.

Mossakowski speaks directly to the matter of standards and to the role that Web services can play. “Standards constitute a major issue in the RFID world, and once established they will help immensely in the development of the tags, the applications, and the databases used throughout the supply chain,” he says. “As the technology matures, Microsoft is working closely with standards developers that are targeting all segments of the supply chain. Moreover, we believe that by implementing RFID applications as Web services, developers will go a long way toward making those applications easily integratable with existing logistics systems. This will help to make the benefits of RFID available to organizations ranging all the way from the small freight forwarder to multinational

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corporations with worldwide supply chains.”

Lehnhardt applauds Microsoft's efforts to further the reach of RFID technology in supply chain management. “We consider Microsoft's commitment to be a serious one,” she says. “This is because the company is working hard not just to drive the technology but also to understand the needs of the customers and to drive the solutions that will benefit them.”

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