



### RADIO FREQUENCY IDENTIFICATION – RFID

This is the second in a series of articles from Peter Bainbridge, winner of the 2003 Logistics Development Award.

A rapidly expanding school of thought touts Radio Frequency Identification (RFID) as changing the way supply chains operate and a revolution in the industry, saving billions of dollars. What is RFID? How does an RFID system work? What are the benefits of RFID to supply chain managers? Why is there opposition to it? In his second article, Peter Bainbridge, 2003 LDA winner gives some answers.

From the first session of the 2003 Council of Logistics Management (CLM) conference in Chicago, the hottest topic of discussion was RFID. Most people seem to be cautiously optimistic about what can be achieved through the use of RFID, others are very excited about the potential this technology has in terms of supply chain benefits.

#### **WHAT IS RFID?**

RFID is a generic term for technologies that use radio waves to automatically identify individual items. There are several methods of identifying objects using RFID. The most common is to store a serial number that identifies a product, and perhaps other information, on a microchip that is attached to an antenna which enables the chip to transmit the information to a reader. The reader converts the radio waves returned from the RFID tag into a form that can then be passed on to computers that can make use of it.

#### **HOW DOES AN RFID SYSTEM WORK?**

The system consists of a tag or transponder, made up of a microchip with a coiled antenna, and an interrogator or reader with an antenna. The reader sends out electromagnetic waves that form a magnetic field when they "couple" with the antenna on the RFID tag. A passive RFID tag draws power from this magnetic field and uses it to power the microchip's circuits. The chip then modulates the waves that the tag sends back to the reader which converts the new waves into digital data.

The technology for RFID has been around for a long time. The barrier preventing its use in the supply chain has been cost. With businesses such as Wal-Mart, Tesco, Marks and Spencer, the US Defence Department and others throwing their weight behind RFID, makers of RFID tags are falling over themselves to make a product that will not only satisfy technology requirements, but do so at a cost that is sustainable for such large scale applications. In January Gillette ordered 500 million RFID tags. Mastercard and American Express are currently testing RFID enabled credit cards. The most common use of the technology today is on toll roads such as City Link in Melbourne.



RFID scanners at the CHEP Pallet Reconditioning Facility in Orlando

RFID tags can be applied to individual units, cases of stock, pallets and so on. As previously highlighted, the cost of manufacturing the tags is prohibitive to having them down to item level at this stage. However, if



RFID testing equipment at the CHEP Innovation Centre in Orlando

companies such as those above make RFID compliance a requirement for doing business, it is estimated that tags would be manufactured in the many billions and could cost as little as five cents.

In testing RFID technology and its application to the supply chain there have been problems. At this stage scanning does not work through liquid. For example, any pallets of soft drink or shampoo would not be able to be scanned. There have been problems with the positioning of RFID equipment on forklifts and within the warehouse to ensure that parts of the warehouse are not missed and that more than one scanner does not read the item.

The other difficulty involved with RFID technology is what to do with and how to store such large amounts of information. Many organisations are struggling with this. Given the huge amounts of data that would be generated from RFID technology, information system requirements would have to be well defined and well organised.

### **WHAT ARE THE BENEFITS OF RFID TO SUPPLY CHAIN MANAGERS?**

Imagine you are a warehouse manager. A container pulls up to one of your docks and is unloaded on to pallets. As the pallet passes through the warehouse door, and past a fixed RFID scanner on the side of the dock door, immediately your warehouse management system knows where that stock is, down to the individual SKU without any manual processing. As it passes through the different stages of processing within the warehouse, whether it be put-away, cross docking or pick and pack, RFID scanners will tell you where that stock is at all times, without the need for the hand scanning required by barcode technology.

Not only does RFID have benefits at warehouse level, it could be applied at the manufacturing stage right through to retail. One of the major reasons Wal-Mart is so keen on the technology is that it could automate checkouts. From a shopper's point of view this would eliminate the most annoying part of the journey. Once you've packed

your trolley, you simply walk through an area that has RFID scanners and the products in your cart are totalled and automatically billed to your RFID enabled credit card.

The potential for automated stock control at retail level is enormous. With an RFID tag placed on all items and on all shelves, retailers would be able to see real time information about what stock is left on each shelf.

### **WHY IS THERE OPPOSITION TO IT?**

Civil liberties groups in America are registering their opposition to RFID technology, fearing that the technology could be used as a further invasion of our privacy. RFID tags placed in clothing or footwear could be used to keep track of people anytime they passed through an RFID scanner. For example, if a store is RFID enabled, and you have an RFID tag in your credit card, theoretically the store could record your visit, whether you purchased an item and, if so, what it was.

Unions aren't keen about the idea of RFID as it could see considerable changes to the labour force. There are calls for strict governance on the use of RFID technology to allay fears of a grave invasion of privacy. However, RFID technology is already widely in use, with the pharmaceutical and meat industries large users of it in the US.

### **CONCLUSION**

RFID technology has the potential to revolutionise the supply chain. Both Wal Mart and the US Dept of Defence have made RFID compliance to carton and pallet level a requirement of their top 100 suppliers by 2005. With this level of interest from such large and influential users, it would seem that RFID technology is here to stay.

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