



# Shaping the Future of the Supply Chain

**The world's biggest retailers are looking at RFID (Radio Frequency Identification). The technology is already being trialled and the potential benefits to the industry are revolutionary. So why the delay in full implementation?**

**What do razor blades and cream cheese have in common?** They are two products that are, today, tagged with RFID (Radio Frequency Identification). They represent the vanguard of what many, if not most, in retail expect to be the biggest thing since PDQ credit card machines, for RFID is being closely tracked by the world's largest companies, from BP to Wal-Mart. And it does not stop with retail. Even the Vatican Library has adopted the technology for the enormous task of maintaining and identifying its vast collection of two million books, manuscripts and artefacts.

However, in spite of the optimism, a sense of caution pervades discussions about RFID. Commercial pressures on retailers are high and while the price of RFID tags and the infrastructure that supports them has tumbled in recent years, companies cannot afford to get their fingers burnt. Issues from the consolidation of standards to concerns about privacy could cause delay and risky unwanted costs. Companies are waiting for a critical mass to be reached, beyond which the benefits of RFID come rolling in.

Several key factors lie behind the high expectations. First is the visibility that RFID brings to inventory management and the supply chain. This is what lies behind arguably the biggest spur so far, the live tests at Wal-Mart.

The world's biggest retailer has instructed its top 100 suppliers to tag pallets and cases by January 2005. And since April 2004, seven stores in Dallas, Texas, and a local distribution centre have been following 21 products from warehouse door to checkout counter. Twenty-one out of the 100,000 items that Wal-Mart stocks is not many – and is indicative of the distance RFID has to travel. But Wal-Mart is certainly giving the technology the thumbs up.

## **SMARTER THAN YOUR AVERAGE BAR CODE**

Inventory management is high on the list of cost-cutting opportunities. Shrinking the inventory the store has to hold makes for significant gains. Wal-Mart hopes that RFID will allow visibility to be passed on to suppliers, by automating asset tracking and eliminating human error. The company says that tracking individual items could be 15 years away, but tagging at the level of pallets and cases is already here. It is the relatively short-term gains that have caused so many in retail to sit up and take notice of RFID. Tesco and Germany's Metro stores are following Wal-Mart's suit.



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## The unstoppable roll-out of RFID

2004	2005	2006	2007	2008
Newcomers will run pilots and test operating environments. Some limited deployments.	Pressure from the likes of Wal-Mart and the US Department of Defense will force the issue of compliance.	RFID capabilities will be widely extended by retailers, distributors and suppliers.	New issues will come to the fore as RFID adoption forces more complex compliance requirements, such as integration with enterprise applications and across verticals.	Standards activity will reach resolution.

*Source: Meta*

More widely, research from grocery think tank IGD suggests that 68 per cent of food and grocery retailers believe the technology will deliver better tracking and greater efficiency in the supply chain. Only two per cent of those asked had not heard about RFID. Sixty-five per cent think the technology will be widespread in three to five years time with 35 per cent working on implementation. Having said that, more than half think that costs outweigh the benefits right now (prices for tags range from a few cents for low-level “dumb” tags to \$15 for the most advanced “read-write” tags).

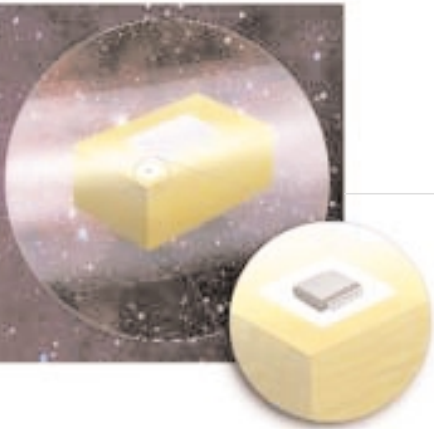
Interest in RFID arises for other reasons too. Take regulation. The Health and Consumer Protection Directorate comes into effect on January 1, 2005 in Europe, and the Bioterrorism Act is already law in the US. These regulations mandate the ability to trace the origins of food to gain control of the supply chain and solve health scares quickly. Tagging food with RFID tags will help manufacturers and retailers comply. “To address the problem of food traceability, retailers and consumer packaged goods firms should use RFID tags to meet traceability compliance deadlines; integrate agricultural firms into the food chain; slash product recall costs with case-level RFID tags – benefits with a clear business case,” says Forrester Research senior analyst Charles Homs. “Regulations don’t specify the use of RFID tags to comply with food safety regulations, but using them to find goods in distribution centres, retail stores and trucks in transit will help firms respond within the predefined time limits to any official inquiry.”

Other RFID projects might tackle criminal behaviour. For example, in South Africa, BP has tagged the nozzles on trucks delivering fuel to prevent the dumping of petrol in illegal tanks. The nozzle only releases the fuel when it senses another tag in the pumps of authorised petrol stations. Health and safety is another obvious area of application. RFID could help inspectors provide automated audit trails and prove equipment tests.

## CAUTIOUS APPROACH

For all the potential, there is a sense of caution. The reason for that stems from a threat of fragmentation in the industry – and the potential worries of consumers. Unless these are tackled, RFID growth will be stunted.

Perhaps top of the list here is confusion about standards. The situation is better in the US than Europe but essentially the issue is that de facto standards have yet to achieve the universal status required for RFID to be truly effective across global supply chains. Until then, companies will hold back for fear of backing the wrong technology. “Disparate RFID standards are slowing the roll-out among retailers in Europe,” says Brad Jarvis, director of product marketing at Printronix, an RFID specialist. “There is widespread confusion as to the correct standards and frequencies they must comply with. A recent study showed that 37 per cent of European retailers were unsure of the



## CASE STUDY: ROYAL MAIL

Royal Mail and CSC are working together to improve the UK's postal delivery service through RFID. They have developed a proposal to place RFID tags inside test letters as well as an RFID reader infrastructure installed at the entry and exit doors of every operational site. Read data will then be transmitted from the readers at each site to CSC's data centre via the Royal Mail IP network, providing a more accurate picture of the postal delivery process. Royal Mail expects to use this data to improve its operations by exposing the failure points at these sites and thereby reduce its exposure to fines. At full implementation, the system will provide asset tracking for 28,000 vehicles, 200,000 containers and 1,500,000 trays.

The challenge has not been merely logistical, but technological as well. Both tags and reader antennae had to be tuned to cope with the postal environment – detecting tags hidden in a mass of paper held within metal containers makes this a leading edge application for RFID. This has required the adoption of passive UHF to meet the read range requirements of loading dock doors, as well as the use of emerging European standards (derived from the current US standards) that give improved reader performance from higher power levels and the use of multiple radio channels.

frequency requirements.” This confusion has arisen due to the different RFID frequencies set for Europe and the US. The US uses a 915MHz UHF frequency. In Europe this is used by mobile phones. The new frequency for Europe is likely to be 866MHz UHF or 888UHF – something to be confirmed this year.

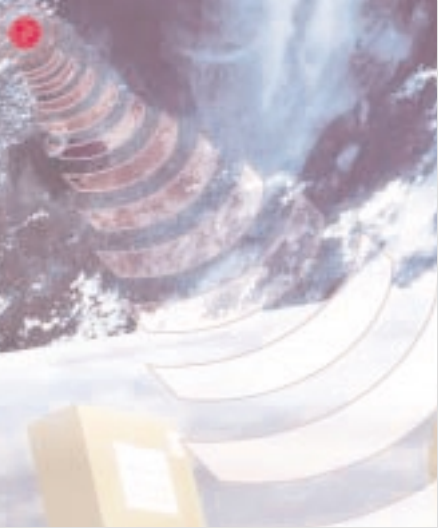
The issue is reflected in research commissioned by Microsoft and the Department of Trade and Industry (DTI). Sixty per cent of retailers feel they do not understand RFID or what it can do for their business (though ironically, the same research showed that the problems retailers have in the supply chain are precisely those that RFID addresses – more than per cent lack visibility with incoming goods, for example).

This points to a wider issue to do with complexity. Although the tags may be cheap, there are extra costs associated with attaching them to products – perhaps two or three times the cost of the tag – and even more costs stemming from setting up the infrastructure to read tags at warehouse doors and checkouts. For this reason, many believe that the technology must shift from its current specialist/closed loop phase to widespread/open loop deployment. To use the analogy of roaming on a mobile phone, if a user moves outside the operator's network, it is able to log on to another network without interrupting the call. Even better will be RFID tags that carry the network with them – something that is referred to as a Mobile Ad Hoc Network or MANET. RFID communications then take place through the tags, meaning the infrastructure extends with the tags on an *ad hoc* basis at low cost.

Alternatively, Meta Group believes that decision makers should not be enticed by the “low-cost tag” hype, since RFID is not a one-size-fits-all approach with unlimited technical abilities. Even though the technology has proven effective in scenarios including toll collection and premium product manufacturing, the researchers are encouraging organisations to keep initial RFID projects at the pallet and case level – acting as bar-code replacements – before moving to more complicated supply chain implementations. “Even smaller RFID projects can significantly affect an entire IT infrastructure and application portfolio, so a readiness assessment must be performed early on,” says Gene Alvarez, vice-president with Meta's Technology Research Services.

Chris Deacon, an head of business process consulting at CSC agrees, advising that potential adopters should first seek to understand the capabilities and limitations. “A compliance-only, ‘slap and ship’ approach demanded by your customers may in the short term let firms achieve their goal of continuing to be a supplier, but the benefits come from looking at your own operations and seeing how RFID can improve them.” RFID should be interwoven with existing IT infrastructure as part of an overall adaptive strategy.

Another major concern is privacy. For example, a recent report from the National Consumer Council (NCC), *Calling in the Chips?*, warned the industry not to ignore its responsibility to the



CSC's Chris Deacon: an overall adaptive approach is necessary for RFID.

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consumer in the rush to realise cost benefits. The risk is a consumer backlash – as the Metro chain found out earlier this year when customers discovered loyalty cards were carrying RFID tags without their knowledge.

The NCC is also concerned that the current regulatory framework is too weak to protect consumer interests, notably privacy. For example, the Data Protection Act may not cover some uses of RFID because it does not use the personal data of consumers. And self-regulation, the NCC suspects, is not enough. "The NCC believes that RFID technology will pose significant challenges to consumer privacy, unless concerted action is taken now," the report says. "Privacy protection must be built into the technology and its applications and must not be seen as an add-on luxury."

There are early signs that the industry is taking notice. Marks and Spencer, for example, has said that it will attach tags, rather than embedding them, so that they can be easily removed. Procter and Gamble has appointed a chief privacy officer.

Other concerns come from within the supply chain. The Yankee Group, for one, has said that four million jobs in the US supply chain could change if barcodes disappear. "Some will lose jobs, but most will see their jobs migrate from mundane identification and routing tasks to more value-added positions," its report *Users and Vendors are Beginning to Explore the Utility of RFID Technology in the Supply Chain* says.

However, the gates to mass adoption are certainly on the horizon. In the competitive industries that RFID could benefit most, there is a compelling argument for taking the risks associated with any emerging technology, in order to steal a march on competitors. "The fear of choosing a potentially 'wrong' standard is preventing many end-user companies from launching pilot RFID projects," says Enrico Camerinelli of Meta. "This is a mistake, as the benefits of getting acquainted with the utilization of the technology and the ability to shape processes around it offset the risk of choosing the wrong standard." He goes further: "We believe the debate surrounding RFID standards, while important for achieving consistency and direction, is in reality an excuse used to 'take time' from those enterprise software vendors who did not foresee the wide interest in RFID and have lagged in their support." Consider yourself warned.

*For more information on RFID and how it can impact your business, please contact Chris Deacon on [cdeacon@csc.com](mailto:cdeacon@csc.com), +44.1252.536267.*