

A hybrid future

RFID may have been a long time coming but both pilots and roll-out projects are proliferating. That, however, doesn't mean the end of the barcode, which is currently undergoing the greatest change in its 30 year history, finds Penelope Ody

Imagine the scene. It is around 2012 and Mrs Average Customer wants to know at which farm her chosen apple was grown. Using a multi-functional scanner on her shopping trolley she scans the apple's tiny barcode label and the display tells her at Farmer Brown's three miles from Stockbridge. The same scanner reads the RFID tags as she passes the DVD display and alerts her that the last copy of the newly released *Harry Potter 8: The Return* movie is on the shelf prompting a triumphant impulse purchase. She completes her shopping by scanning an EAN-13 code on her extra large packet of soap powder. Clicks "pay" on her mobile phone, scans the barcode it displays with the trolley device and heads for the car park.

Far-fetched? Possibly, but our 2012 customer will certainly find both RFID and assorted barcode technologies in-store while sales staff – and possibly shoppers – will be using multi-functional wireless devices capable of reading whichever system is relevant for that particular product category.

GS1 – the global barcode and RFID standards organisation – has declared 1 January 2010 as the "sunrise date" by which time retailers are recommended to have systems in place to read reduced space symbology barcodes. RSS has been around for several years, but the standards are now established and the system relabelled as "GS1 DataBar" to avoid confusion with "RSS XML.Feed" technology.

DataBar codes are less than half the size of today's EAN-13 barcodes but have the potential to encode very much more information – potentially in composite codes up to 2,000 characters. Early projects using GS1 DataBar are, however, rather more modest. David Roome, business manager for barcodes and eCom, at GS1, sees individually labelled fresh produce items as among likely candidates. "DataBar codes could give information about expiry date as well as source or batch codes to improve traceability," he says.

Currently, it is virtually impossible to label loose produce items with anything more than a name or variety, but with a DataBar barcode there will no longer be any confusion or errors at the

checkout as operators try to differentiate Granny Smiths from Golden Delicious. Items reaching end of life can also be accurately identified to help control wastage while rapid access to exact batch code details can simplify management of product recalls. With green shoppers already starting to reject over-packaged produce, we can expect more loose greengrocery items in future and DataBar will make individual labelling practicable. Tesco is among retailers already testing it for loose produce with pilot projects covering such lines as loose tomatoes.

For higher value lines, Roome also suggests that a tiny DataBar code could contain the product serial number adding the information to a receipt to help combat fraudulent refunds or simplifying data entry for warranty records. "I really don't see DataBar as simply a temporary stepping stone to RFID," he says. "No-one is ever really going to put RFID tags on individual apples or pears and the smaller codes are already being well received by FMCG packaging designers as they allow more space for brand messages or nutritional information."

Poor awareness

With over two years to go to the 2010 "sunrise" awareness of DataBar remains low, but Roome believes that most retailers will be able to read the new codes without a major hardware investment. "Most barcode scanners sold in the past four or five years are DataBar compatible – although the functionality may not actually be switched on," he says. "There will need to be some software changes to EPoS systems, though, and we would encourage all retailers to start looking at how it will impact their systems now."

Suppliers agree: "While the names have changed the basic information and structure of the barcodes has not," says Dave Wilz, senior software engineer at Metrologic. "The DataBar codes contain the same information and are encoded and decoded using the same methods and algorithms as for existing RSS barcodes. Scanners that support RSS barcodes can support GS1 DataBar. Most scanners are not configured to do this at default but the features can be easily enabled through configuration."

There are no plans to phase out EAN-13 codes at this stage and GS1's Roome believes that the symbology will remain in use well beyond 2010. Some would argue that it can already provide much of the likely information that DataBar codes will store. "We have installed quite a few systems where the EAN-13 code can be scanned by mobile devices using wireless connectivity to access central databases," says Peter Lewis, marketing director at Episys.

Episys has also worked with one retail customer to develop a system for embedding URLs in a barcode, which can then be scanned to take the customer directly to the relevant website page for further information. This, as Lewis points out, also enables access to current up-to-date information whereas similar data embedded in a barcode cannot then be changed.

Fujitsu Services was showing a similar sort of technology at Retail Solutions in June with a demonstration of steganography – the ancient art of hiding a message within an image. The company already has a number of live projects in Japan where a 12 digital code is embedded in a photographic image and can then be

"read" via the camera in a mobile phone. This then triggers a link (with the help of a downloaded Java applet) to a website to order the item or access additional information. In this system there is no obvious barcode, just the embedded code in what looks like a perfectly normal photograph.

So where does that leave RFID? Current retail interest in the technology still focuses largely on case or pallet tagging in the supply chain, although Marks & Spencer has demonstrated real benefits of item-level tagging in its expanding "intelligent label" scheme. "RFID is no longer on trial," says James Stafford, head of M&S's RFID programme. "There is a business case and very encouraging results."

Since its first tests started in 2002, M&S has slowly expanded the programme. Last spring 42 stores were live with six product groups and the roll-out is now extending to 120 stores with additional product groups – including various lingerie types and men's casual trousers – tagged from July this year.

In this scheme staff are able to perform quick and accurate stock checks in minutes by running a portable RFID reader along a rail of garments. It is already delivering real benefits in terms of reduced stockouts, better stock control, and greater customer satisfaction. Unlike barcodes, RFID does not require line of sight reading capability so is ideal for this type of application.

While Wal-Mart's equally high profile RFID scheme is confined to cases rather than items, it too has reported impressive and quantifiable benefits. According to Ron Moser, head of RFID strategies at Wal-Mart, stockouts are down by an average of 16 per cent. Wal-Mart's improvements derive from the ability to track product through the supply chain and find it easily in sometimes chaotically organised store areas. Again, this is not something you could do with either EAN-13 or DataBar barcodes.

A deterrent for RFID has been cost, but with printable codes now being introduced by companies like Aegate bringing the label cost down below one cent, and with companies like Crown Packaging developing RFID labels that can be printed on metal cans the system could be a real alternative to barcodes in future. "We know that RFID can increase supply chain visibility and reduce stock-outs," says David Lyon, EPC business manager at GS1. "With the cost of labels falling below one cent, item level tagging becomes a more viable option – but you still need to apply common sense. Item level tagging generates huge amounts of data and do you really need that level of information for all product lines?"

Like GS1's Roome he sees little point in item tagging large numbers of identical products – barcodes are perfectly adequate and DataBar can provide access to large amounts of encoded information if need be. "RFID certainly has a role in areas like combating counterfeit goods or added security for high value lines," he says. "But not for individual items of fruit."

A new generation of hybrid scanners – capable of handling EAN, DataBar and RFID – is already emerging. Add a digital camera and you can play with steganography as well. For retailers the challenge will be to choose the most appropriate tagging method for each line: a method which provides relevant information to wherever it is needed.