

# Wireless Healthcare – Briefing Note

## RFID - A Double Edged Sword

Radio Frequency IDentification (RFID) is set to revolutionise retailing, it could also form the basis of a number of new and innovative, healthcare related, services. The potential of automated shopping systems, where the customer scans products as they take them from the shelf, will increase markedly as RFID technology is deployed - consumers may even be able to access RFID data using a device attached to a smart phone or PDA.

While, at present, there is much talk of consumer resistance to RFID technology there are a number of other issues retailers should address before deploying RFID systems. RFID technology could support services that, far from threatening their privacy, empowers the consumer and enables third parties to influence a shopper's purchasing decisions. In this paper we consider the threat posed to retailers by RFID based services and steps that should be taken before migrating automated shopping systems first from a barcode scanning to a RFID platform and then from a Wireless LAN to a mobile phone network.

Wireless technology is already being used to support automated shopping systems. Here the customer is issued with a hand held barcode scanner as they enter the store. The device is used to scan items as they are taken from the shelf. The handheld scanner is connected, via a WLAN, to the server hosting the store's product database and the customer's account file. The system offers the customer an alternative to waiting in a queue to unload their shopping trolley at the store's checkout desk. While the customer saves time and effort the store can reduce manning levels.

Automated shopping systems can provide healthcare related services: for example, alerting the customer if they have selected a product that is likely to cause an allergic reaction. In a majority of installations these functions are not implemented.

### At A Glance

The current controversy surrounding the deployment of RFID in customer facing applications is centred on the threat the technology poses to the privacy of the consumer.

RFID technology could become disruptive to the retailer's business model if third parties use it to overlay an alternative database on the retailer's operation. This could happen if independent organisations use RFID technology to provide health related data on a wide range of food products.

Retailers could either abandon the deployment of customer facing RFID applications, block third party access to RFID tags or build their own suite of RFID based services that can be accessed by customers.

## Customers Helping Themselves

If a store's products contain RFID tags then a customer using an automated shopping system no longer needs to scan each item with a barcode reader - instead the entire trolley full of shopping is scanned, in one operation, at the checkout. The trolley can be fitted with a screen and scanner so that the customer can keep track of their purchases and be made aware of special offers at the point of purchase. The screen could also, in theory, be used to display dietary and other healthcare related information. This is how most retailers see RFID being deployed in their stores.

There is however an alternative scenario. RFID could be used to support independent product information services. Such services would be welcomed by public health organisations that are keen to see the deployment of technology that helps people comply with diets and prevents, or manages, diseases such as diabetes.

There are already a number of diabetes management services that use smart phones or PDAs and run over conventional GSM networks. Although RFID technology is still relatively expensive a number of vendors have produced scanners that can be attached to wireless PDAs or smart phones. Once the price of this technology falls to the point where it can be incorporated, as standard, in mobile devices then automated shopping could develop in ways the retailer can neither predict or control.

The current controversy surrounding the use of RFID centres on the threat the technology poses to personal privacy. However the retailers themselves may find their own privacy under threat as third parties overlay an alternative product database over a store's product line.

This may not happen - after all barcode readers that can be used with mobile handsets are have been available for some time. These devices were designed to support a number of on-line services that have, so far, failed to capture the public's imagination.



Symbol's technology is used to support an in-store automated shopping system running over a Wireless LAN.



IScan's shopping technology is based on a conventional mobile handset fitted with a barcode reader.

However there are a number of reasons why customer facing retail solutions based on RFID tags may prove more successful than ones based on bar codes:-

- Scanning a product containing an RFID tag is simpler than scanning a barcode as the product does not need to be picked up or repositioned by the customer.
- The current generation of smart phones and PDAs are more powerful than the devices on the market when vendors launched services that relied on the customer scanning a barcode.
- Due to the controversy surrounding its deployment RFID has captured the public's imagination in a way barcodes did not.

Factors that could accelerate the deployment of third party RFID based information systems include:-

- Consumers purchasing RFID scanners to verify RFID devices have been deactivated or to detect tags that may be hidden in products they have purchased.
- The use of RFID scanners for applications such as online shopping and counting banknotes.
- The embedding of RFID devices in security passes and exhibition visitor badges.
- RFID based services that provide people who suffer from allergies with relevant information on food products at the point of purchase.

This last service should be of particular concern to the retailer and food producer as it could be extended to cover a range of dietary information regarding a particular product – for example sugar and salt content. While this service would be useful in the promotion of public health some information provided by third parties could be presented in ways that were at variance with the way the retailer and producer wished to promote the product.



Blueleaf supply a range of handheld RFID scanners and now produce a compact flash card based RFID reader.

Some services offered by third parties may appear to be relatively benign others, however could be disruptive to the retailer's business model.

One example might be data provided by special interest groups who, for political reasons, have blacklisted a range of products. Another would be a Kelkoo type online service that enables the customer to compare prices in a range of stores at the point of purchase – in the extreme the customer could scan a product in one store using their mobile phone and buy it online from another retailer or even direct from the manufacturer.

A simple healthcare related service could develop into a 'store within a store' making it difficult for the retailer to exercise control over their business. To avert this threat the retailer has three options:-

- They could abandon plans to deploy RFID in its current format and develop a propriety system. The retailer and supplier would forgo some gains from improved supply chain management. They would also miss out on the economies of scale that emerge as chip manufacturers ramp up production of RFID devices
- They could prohibit or block the use of mobile devices and personal RFID scanners within their stores. (The network security specialist, RSA, has already demonstrated a device that prevents unauthorised access to RFID tags.) They could also de-activate tags when products are placed in stores. This may be unpopular with customers and controversial if the RFID based service being blocked is providing healthcare related information – it may also prove disruptive to a stores own automated shopping system.
- They could implement their own RFID services by migrating existing automated shopping services onto standard mobile platforms then enhancing these services by adding advanced features such as healthcare and diet planning.



Nokia are planning to supply a RFID development kit, for use with the Nokia 5140, in the summer of 2004

The retailer is faced with three choices:-

They could postpone or abandon deployment of RFID technology in customer facing applications and use propriety technology.

They could block third party access to RFID data or deactivate tags when products are put on display.

They could build their own suite of RFID based services that customers could access with a mobile device.

## Vendors



Blueleaf

In seven years Blueleaf have developed a range of RFID scanning technologies that support inventory control applications within the manufacturing and healthcare sectors. The company's scanners are modified versions of readily available handheld devices. When the corporate sector began to show an interest in wireless PDA based applications Blueleaf developed a compact flash card that converted a PDA into a RFID scanner.

The card fits into a standard compact flash slot of handheld devices and laptops and reads a broad range of 13.56MHz tags up to a distance of 50mm. Software drivers are available for Windows CE. As yet the device is not in volume production.

### Blueleaf At A Glance

Founded in 1997  
Headquartered in UK  
6 Employees

Privately owned Turnover  
2002-03 £250,000 projected  
turnover 2003-04 £350,000

Primary business is RFID  
scanning systems, customers  
include British Telecom and  
Swindon NHS Trust.

[www.blueleaf.co.uk](http://www.blueleaf.co.uk)

### Analysis

To date most of Blueleaf's scanners have been used in corporate applications such as stock control – now, in the compact flash RFID scanner, the company has a product that could sell in volume to the consumer electronics market. As the company is relatively small it is unlikely the company will ramp up production of the reader until its customers have rolled out systems built around a PDA or smart phone.

If retailers start deploying customer facing RFID scanning systems Blueleaf will be presented with a small window of opportunity within which it can either find a partner in the consumer electronics market or attempt to market the compact flash card itself. It will have to run fast to stay ahead of companies such as Nokia who are already experimenting with RFID peripherals that can be used with top of the range handsets. Given that Blueleaf is geared to providing complete RFID systems, and that it already has some experience of selling through distributors and dealers, finding a partner might be the best option.



A number of food retailers in the UK have deployed Symbol's 'Portable Shopping System'. Using a hand held wireless device, shoppers scan the barcode on an item as they take it from the shelf. The system eliminates the need for the customer to unload and reload a shopping trolley at the checkout. The store can reduce the number of checkout staff it has on duty and relay special offers – such as two items for the price of one – directly to the shopper at the point of purchase.

The Portable Shopping System is based on Symbol's Spectrum24 2 Mbit wireless LAN. This network can be used for both voice and data applications and has been designed to support the IEEE 802.11x standard for wireless communications and the ITU H.323 standard for multimedia communications.

The wireless scanner is linked to a database that contains the customer's account details. It also retrieves data from the store's product database when an item is scanned. This data could include information on the ingredients of a particular product enabling warnings to be relayed to a customer who has an allergy to certain types of food.

### Symbol At A Glance

Founded in 1975

Produces bar code scanning equipment. Launched its Portable Shopping System in 1993 and its Spectrum Wireless LAN product in 2000.

Headquartered in Holtsville, New York, USA. Listed on the New York Stock Exchange.

After taking a pre-tax charge of \$72 Million, incurred a loss of \$12.9 Million during the first three quarters of 2003

[www.symbol.com](http://www.symbol.com)

### Analysis

Symbol's Portable Shopping system could be used to help people maintain a healthy diet. It could also, in theory, be rolled out on a GSM or GPRS network as an ehealth service. However for this to happen the product databases of leading food manufacturers and retailers would have to be more comprehensive than those in place today. As well the service would need access to a patient record database. Even though the system could warn nut allergy sufferers not to buy certain products, few stores have implemented this feature.

The Portable Shopping System will face competition from RFID (Radio Frequency IDentification) based applications that eliminate the need for the customer to scan items. Many healthcare and diet related services, which could have been supported with handheld scanners, would instead have to be made available to customers using an RFID system and a trolley-mounted scanner.

The emergence of a GSM or GPRS based shopping system, that accessed RFID information and used dietary information provided by an independent vendor, might encourage stores to roll out their own health related services.



iScan have developed a barcode reader that can be attached to an Ericsson mobile handset. They also supply an application server Software Development Kit (SDK) to enable third party developers to integrate the iScan reader into existing software packages - or develop new services based on barcode scanning. The company promotes a range of applications in the medical, consumer and agricultural sectors. They also suggest a number of services that could be built around the mobile scanner such as posters with barcodes that could be swiped if a consumer wanted further information on the product being advertised.

### iScan At A Glance

Founded in 2000  
Headquartered in Italy  
Supply mobile barcode reader solution.

Privately funded - seeking finance to develop a RFID scanner.

[www.iscan.it](http://www.iscan.it)

### Analysis

It is difficult to get the general public excited about barcodes. The one application where the consumers do scan a barcode – automated shopping – appears not to have been targeted by iScan. To break into this market the company would need the support of a large vendor in the labelling or retail equipment sector. The medical sector, where the company sees some potential applications for its scanner, is already well served by systems running on Wireless LANS. The iScan system could, in theory, assist the migration of these applications from LANS to WANS. However the device was developed for a restricted range of, what are now, rather dated handsets.

A smart phone based scanner would enable a shopper to store a database of barcode information in the handset rather than rely, as iScan does, on SMS technology to extract data from a central server. If it is successful in obtaining funding iScan should be able to use its skills and experience to make an attack on the RFID market. However without finance it will remain just a good idea with a web presence.

This Briefing Note has been issued as an update to the Wireless Healthcare 'NextGen Healthcare' and 'Mobile Operators' reports. Notes are free to customers and clients who have purchased a Wireless Healthcare report. Detailed briefings are available as part of our analysis and consultancy services.

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# Wireless Healthcare

eHealth providers, technology, companies and markets

## Mobile Operators – Fully Engaged

Derek Wanless, an advisor to the UK government, has highlighted the need for a fully engaged healthcare scenario within which public health becomes the responsibility of a range of organisations as well as the individual. Mobile operators could become key players in a fully engaged healthcare scenario. They have access to the wireless technology needed to support a wide range of mobile healthcare services. They also have access to the youth market - a demographic group that is often beyond the reach of traditional healthcare providers.

We have identified three areas where mobile healthcare is applicable within a fully engaged healthcare scenario: -

### Supplying Dietary Information.

Some food stores have already installed hand held wireless scanners that allow shoppers to scan products as they add them to their shopping trolley. These systems are capable of providing healthcare related information about products - such as ingredients that can cause allergic reactions. RFID labelling and scanning devices that can be used with mobile handsets will become key drivers in this market.

### Fitness and Training.

Smart mobile handsets could be used to upload training programs into exercise equipment. This service could prove particularly compelling and profitable. It would also exploit the mobile operator's access to young people whose lack of physical activity is worrying policymakers in the healthcare sector.

### Health Monitoring.

Technology, such as wireless enabled scales and blood pressure monitors, can be used to support mobile patient monitoring services. These services can be used to monitor compliance with weight loss plans and gather data prior to a patient's visit to a GP.

Who should purchase this report: -

- Mobile network operators.
- Wireless equipment vendors.
- Healthcare providers.
- Handset and PDA manufacturers.
- Decision makers in the public healthcare sector.
- Investors in the healthcare sector.
- Other organisations active in ehealth provision.

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