



RFID Checks Out

Radio Frequency Identification (RFID) technology has been around since the 1940s, yet it is only recently that retailers have begun using it in their operations. It seems as if people are only now realising that RFID can be used for a variety of purposes in-store. The benefits to retailers using RFID are numerous and can include a long-term reduction in costs and increased productivity. In Asia, most RFID applications within a retail environment are in the pilot phase, with the majority being on the supply chain side.

what is RFID?

RFID is an automatic identification system that relies on storing and remotely retrieving data using devices called RFID tags that can be attached to or incorporated into a product, device, animal, or person. RFID tags contain antennas that enable them to receive and respond to radio-frequency queries from an RFID transceiver. As one source said, an RFID tag is basically a tag that has imbedded intelligence information – similar to a number plate on a car.

Information gained from pilot operations by store planners preparing a roll out in non-home markets may help to develop a case for a layout and design that will offer greater appeal to the local target market.

so why RFID after all this time?

Wal-Mart has been piloting RFID technology for some time in its Texas, USA, stores and in 2003 issued a mandate to its suppliers to place RFID tags on all their shipments. When asked why Wal-Mart decided to adopt RFID only recently, Christi Gallagher, Spokesperson, Wal-Mart said: 'There comes a time with every technology when someone has to step forward and say "the time has come" and the time to introduce RFID solutions into the retail industry has come'.

RFID has been in use in libraries worldwide for some time, as this is a "closed loop" system. This means that objects which have tags embedded, in this case books and other library materials, return to the library after they have been borrowed. A "closed loop" system makes RFID technology relatively easy to implement. In a store there is an "open loop" system, where purchased objects do not return to their source and cease to be under the control of the retailer, making RFID more difficult to implement.

In Asia, there has been “a lot of interest in piloting” RFID within a retail capacity, says one Managing Director of an RFID solutions provider, with numerous pilots currently taking place. However, through this “new found understanding and appreciation” of RFID, people are also starting to see the realities of implementation more clearly, says the source. Retailers need to consider whether adopting RFID is technologically, and financially, viable for them.

benefits of RFID to retailers

“Once the system is in place, the benefits to a huge corporation like Wal-Mart will be instant”, adds the source. Some of the main benefits to retailers of using RFID include:

- ‘Smart shelving’ - this involves installing readers on shelves that can help retailers track inventory and avoid store theft.
- ‘Self check-out’ – this will eventually eliminate the need for cashiers, thereby reducing labour costs and checkout times, thus encouraging people to buy more.
- RFID readers installed on the loading dock could instantly determine whether the correct amount of stock has arrived, eliminating the need for someone to count each item or palette as it arrives.
- No line of sight required - as long as each item in a customer’s shopping basket is properly tagged, the customer or store attendant can simply pass goods over or by the RFID reader for immediate recognition at check-out.
- Real time inventory tracking through smart tagging - this allows for the pricing of goods to be changed electronically through readers, as opposed to shop staff having to manually change the prices on all goods.

For store managers and professionals involved in the design and layout of stores, tags can also be introduced to help retailers monitor what people buy through devices such as RFID enabled loyalty cards or where they move through the shop by tagging shopping carts. This information when combined with knowledge about the presentation and location of certain items, can be used to improve store design, cargo bay/entrance/checkout location and even reduce space requirements in-store and in warehousing areas significantly.

It is conceivable that information gained through RFID tagging could help store planners setting up in Asia in particular. Information gained from pilot operations by store planners preparing a roll out in non-home markets

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may help to develop a case for a layout and design that will offer greater appeal to the local target market. For example, museums in Japan have tagged visitors in order to track their progress around the facility. This has made it possible to determine popular and thus successful displays, enabling them to improve their offering over time.

barriers to RFID use

In Asia, RFID use for retailers is still mostly limited to applications within the supply chain. According to the source, a Managing Director of an RFID solutions provider, there is still “a long way to go” in terms of item level tagging and tracking, with most retailers “still in the piloting phase”. He added that “to tag a carton or a packet is a lot easier than tagging smaller retail or merchandise items”, such as jewellery or a t-shirt, which might offer concrete benefits to retail FMs and store designers. Some further barriers to RFID relate to high cost and privacy;

- Individual RFID tags are expensive. The source says “label pricing is still pretty high” at between 30 and 40 US cents, as opposed to between three and four US cents for a regular barcode. When you add this to the cost of goods such as shampoo or toothpaste, it reverses the potential cost benefits of enabling RFID on each good.
- Installing readers within the store and loading dock can also incur a high cost – though this cost is reduced in new build projects designed with this technology in mind.
- Even if the information gained from RFID tags is a retail marketer and store planner’s dream, customers may feel that their privacy has been infringed through retailers knowing their shopping habits.

Costs are coming down and wider implementation of RFID tags and readers has both created a greater interest in their uses and a critical mass upon which producers of goods and store managers may garner information.

the future for RFID

As people’s knowledge and understanding of RFID continues to flourish, the technology is definitely set to grow. Whilst most pilots in Asia are being done on the supply chain side, the potential benefits for retailers in terms of the facilities they manage are huge. As one source was quote as saying “eventually it will be an RFID world, it will just take time”.

case study 1: Wipro

In mid 2003, leading retailers such as Wal-Mart, Target and Albertsons, issued mandates to their suppliers to place RFID tags on shipments at the palette and case level, triggering a lot of interest in the industry. Wipro, a leading IT solutions provider, noted these developments and saw the huge potential for RFID within the retail and CPG (consumer packaged goods) sectors.

For a proof-of-concept, Wipro created an RFID-enabled apparel store at its Bangalore campus – the first of its kind in India. The concept store demonstrates how item level RFID tagging enables automatic check-out, intelligent shrinkage avoidance to tackle theft and product misplacement, smart stock maintenance, and tracing and tracking of apparel by the store manager. The store showcases RFID technology across different business processes and has been launched to help customers understand the working of RFID in a real-world retail environment. The concept store is part of the RFID centre of excellence at Wipro Technologies.



Kannan Natarajan, Domain Head, Retail, CPG and Distribution, Wipro, says some of the main benefits of having an RFID enabled store include:

- Improved inventory visibility in the store
- Reducing out-of-stock situations
- Real-time alerts when merchandise is misplaced or reduced below re-order level
- Reduced shrinkage
- Customer satisfaction – as items are found at the proper place

Wipro designed the RFID solution for an existing store and Natarajan found numerous challenges, such as “identifying the location in the apparel for the tag, antenna orientation and fine-tuning the application, so as to ensure 100 percent reader accuracy”. In order to offset the high cost of RFID tags, Wipro decided to reuse the tags. By detaching the tags from the product at POS (point of sale) billing, it was able to reduce the recurring cost of manufacturing new tags for each item.

When installing RFID within a retail property, Natarajan says several factors that impact the RFID system design need to be taken in to account. He says: “The object which is to be tagged, its location (shelf-wooden, metal), how it is stored and how it is

moved all impact the RFID system design”. Other radio-frequency signals in-store can also have an impact. Special features that needed to be installed in the building included:

- RFID readers/antennas – to capture the RFID data
- RFID middleware – to process (filter, duplicate, removal etc) the data
- Application on top of RFID middleware

When asked if it would be easier for a retailer to move into a facility where RFID readers had already been installed at the building design stage, as opposed to installing RFID themselves in an existing build, Natarajan says “it would be easier to analyse existing objects/operations and then design and fit RFID accordingly”. In addition to this, he believes installing RFID in a store with an odd or unusual shape would not be a problem. He says: “There are various types of readers available on the market in terms of frequency of operation and read-range. One can choose according to the requirements”.

In terms of the facility management of the store, Natarajan says that ‘smart shelving’ has improved store stock accuracy, as the “product is always on the correct shelf at a specified quantity”. This assures improved product availability for the customer. In addition to this, he says customers also benefit through information kiosks and enhanced personal shopping experiences through RFID enabled loyalty cards.

In India, the growth of retail RFID use is very much dependent upon factors such as tag and reader cost, as well as read rate accuracy says Natarajan. In practice, successful read rates currently run at 80 percent, due to radio wave attenuation caused by the products and packaging.

Natarajan adds that at present, retailers in India “are experimenting with RFID through pilots at the distribution centre level”. Although Wipro has no plans for a new RFID enabled store, Natarajan says “the existing RFID concept store is an investment to create a functional model and an example for RFID implementation”. He says the store has helped Wipro gain a better understanding of the technology within a retail environment and has put them in a position to provide RFID consulting and services to retailers such as Pantaloon in India.

case study 2: Securepark

Radio Frequency technology is also being used in various car parks throughout Hong Kong to tackle car theft. The security solution, known as *Securepark*, was created by The Location Company Limited, a vehicle location detection service provider that aims to help property managers in Hong Kong reduce the number of cars stolen in their carpark facilities.

According to The Location Company, statistics compiled by the Crime Prevention Bureau of the Hong Kong Police show that some 512 cars of different makes and models were stolen between January and November 2005. Twenty-two percent of these were stolen by car thieves un-detected whilst parked in multi-storey car parks around the territory.

Alex Keay, Chief Technology Officer, The Location Company, says that the property managers of these carpark facilities are often blamed when thefts occur, as they are responsible for the installation of new security systems and technologies. Therefore, assuring high value automobiles have adequate security is a big business with heavy responsibilities.

The majority of property managers in Hong Kong are at least aware of the issue, as most car parks have been affected by car theft at one time or another, says Keay. He adds that non-assigned car parks adjoining retail facilities provide particularly good locations for thieves, as people are often gone from their cars for defined periods of time when shopping or seeing a film.

RFID to the rescue

Securepark is the first patented parking security solution in Hong Kong that uses OFTA approved frequencies to wirelessly connect to a carpark's security network. *Securepark* consists of several sophisticated and miniature components that are installed covertly in different locations of the car, making it difficult for burglars to detect them.

In order to install *Securepark* within a parking facility there is certain telecom work that needs to be done, such as the installation of centres, as well as a radio frequency map of the premises, says Keay. The Location Company then goes back and tests the coverage. He says the technology can work in any carpark and that a sensor will be placed within 50 yards of your car. All parties involved with building security are involved to discuss the various stages of implementation.



The property managers of various carpark facilities approach car owners on behalf of *Securepark* and when someone subscribes to the *Securepark* system they have a home location. Certain protocol has been put in place to ensure that the system guarantees that if your alarm goes off someone will check your car, says Keay, with *Securepark* continuing to transmit even if the alarm on your car has been cut. The device will continue to submit until something has been done, with a report needing to be entered by the subscribing property's security.

Where as one of the main barriers to RFID is the cost of tags, *Securepark* differs in that the security of car parks is a pretty expensive business, says Keay. He adds that the cost of *Securepark* is competitive when compared to the cost of current mechanisms used, such as tire slashers and raised barriers. Initially, The Location Company will target monthly assigned carparking facilities, as in this instance the property manager knows the customer. This is not the case with a retail carpark where the customer is constantly changing. **RFP**

