Electronic Data Tags ('Intelligent' Tags) >>

Electronic tags are now used in a wide variety of retail and supply chain applications to curb theft, provide information about shopping trolley use, control access to store or office areas, drive automated or semi-automated warehouse or transhipment facilities, manage inventories, and provide information about distribution systems. The market is divided into categories differentiated upon "traditional" lines by technology. Hence there are electronic article surveillance (EAS) products; radio frequency identification devices (RFID); and smart card devices which have developed in relation to different markets and technologies and are not generally seen as being part of the same family of products. There is no accepted phrase available which can be used to group this family: "intelligent tags" is one attempt but we use the term "electronic data tagging".

Main types of electronic tag

The main types of electronic tag relevant to the developing retail agenda are:

- Electronic article surveillance tags (EAS)
- Radio frequency identification devices (RFID)
- Smart cards (contactless)
- Intelligent tags

These are all devices which signal their presence and transmit data, if only 1 bit (ie present or absent) as in most EAS tags. Although they are very different products, they are relatively compact electronic devices and have a wide variety of applications. They are low cost and are likely to fall further in price. They are robust in the sense they are designed to last as long as the application and are available in a number of housings, the choice of which will depend on the precise use intended for the device. They will also be affected by developments in other business sectors, which will encourage innovation and bring down prices.

The retail agenda is long term as well as short term

There are many potential applications for electronic data tags. Current possibilities are, of course, limited by what is commercially available. Future possibilities will be limited by commercial requirements and the laws of physics. Hence, we can say on the basis of what is known to be available, technological and economic (scale) factors will prevent a cheap intelligent tag being available in a form which interests supermarkets for low-cost fmcg perhaps until 2002-5. Similarly, whilst electronic tags can now perform an identical role to that of product bar codes, this is a long way off in most sectors and there are logistical issues to be faced if the transition from bar codes is to be made. Moreover, the state of current knowledge about electronic tags suggests that it is unlikely that one single technology or type of tag will wipe out the alternative products in the next 10-15 years. Similarly, the normal EAS paper tag cannot be converted to hold and transmit additional data in its present form.

Much discussion about intelligent tags assumes that all tags will have a high level of functionality. There is no reason why this should be so. Cost reasons alone may mean that 'chipless' data tags or extensions of EAS may well be more attractive to the general retailer. There is plenty of evidence that whilst retailers are committed to change, they are very careful about the take-up of new technologies. For reasons of both high price and the technological limitations of what is expected to be on offer for the next few years, routine electronic data tagging of merchandise is some years away. In 2003, we are in the same position regarding electronic data tagging of retail merchandise applications: it is not enough to have a vision: you need low-cost reliable products to make it work.

Retailing's agenda for electronic data tags: the vision

Over the last five years there has been growing acceptance of EAS. The agenda for both retailers and EAS suppliers is to develop EAS tagging of merchandise by product manufacturers. There have been several initiatives involving individual retailers and the British Retail Consortium. However the only trade sector which has made considerable progress in using a single technology and persuading merchandise suppliers to source tag is DIY/hardware (using radio frequency tags). At the same time, RFID products are making some headway into the distribution sector.

The principle of electronic tagging as a means of controlling merchandise or the distribution system has become widely accepted. The vision is, therefore, to develop a range of low-cost electronic data tags which can hold information about merchandise (including product number, price, date, batch, sale/no sale), which can be fixed to merchandise and provide many, not one, functions in controlling retail operations in-store and along the distribution channel. This would not be an extended EAS tag, but a radically new method of data collection in retailing. Potentially it would have the same impact upon in-store and distribution data collection as bar codes have had over the past 15 years.

The range of applications for which electronic data tags would be suitable is for retail merchandise applications:
1. Retail theft - a variety of applications such as fashion, clothing, grocery, electricals, recorded music. A much more practical tag for clothing than is available at present.

2. Supply chain control - tags can be used to control the movement of goods from one process to another, be used for routing goods through the warehouse, delivery control, and to assess the effectiveness of the supply chain itself. Benefits would also occur in organising stockless transhipment depots, transferring goods automatically between points.

3. Inventory control - every tag can be read to give information concerning batch number/unit, the number of items in store, or information on category and colour which may not be held by the normal retail computing system.

4. Intelligent packaging - a tag linked to a sensor would provide data on whether the product has been tampered with at any stage, the status of the merchandise (eg whether fresh meat has been held at the correct temperature), and provide in-store information to customers and at home.

5. Asset control - tags could be used to determine the location of an asset, or to ensure the asset was not moved out of a defined zone.

6. Customer benefits - sophisticated tags can continue to provide information after PoS for customers.

The scale of production of tags is still relatively small. It can be expected that companies such as General Dynamics, GE, AEG, and Motorola will enter the market on a large scale driving down prices. Label companies will also join the market, perhaps bringing some newer approaches to the industry. Using present technology, there are minimum prices set in relation to the price and amount of silicon used, the housing containing the electronic components, and the means of attaching it to the product. Tags could be read only or read/write. The most satisfactory means of dealing with different types of information seems to involve partitioning, which would help to ensure data integrity.

It is likely that tags will both be integrated with the product at time of manufacture and attached to packaging or the article, much as EAS tags are now. Tags which are to form a functional part of the merchandise will need to be integrated. Retailers will need to determine by trial and error which is the best solution for them; hence they will need to keep their options open.
Conclusions
Electronic data tagging is a long term development, which may not achieve its full potential within 10 years. However there are several retail sectors where the price/performance equation would be beneficial now, and which could start to use electronic data tags within the next two years. The retail agenda behind electronic data tags is very clear, although it has not been articulated by any major retailer or trade body - yet. It covers security, PoS, inventory control, along with, preferably, supply chain information: these are all points where, at present, data is collected to drive retail operations.