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CASE SUMMARY

Wal-Mart, the world leading retailer, announced it will expand its rollout of radio frequency identification (RFID) to a total of 300 suppliers by 2006, following meeting with its top vendors. The retailer's top 100 suppliers have already agreed to implement RFID by January 2005. Wal-Mart plans to have the inventory tracking system, which uses radio frequency technology, in six distribution centers and 250 Wal-Mart stores and Sam's Club stores by next June. By October of next year, the program will include up to 13 distribution centers and up to 600 Wal-Mart and Sam's Club stores. By the start of 2006, Wal-Mart's next top 200 suppliers will begin tagging cases and pallets, bringing the total to 300 vendors.

INTRODUCTION

Radio Frequency Identification (RFID) technology has been in commercial use since the early 1980s. It has been employed, for instance, on highway and bridge tolls, in tracking livestock movements, in tracking airfreight and in motorcar manufacturing, but until recently, the technology has been too expensive and too limited for mass commercial applications. However, retailers are now starting to drive the introduction of RFID and it would seem to have the potential to revolutionize efficiency, effectiveness and security throughout supply chain. By definition, RFID is a technology process starts with a tag that is made up of a microchip with an antenna and a magnetic field when they join with the antenna on the RFID tag (FRiDa.com). It's one of the most powerful IT strategic assets in use in retailing industry. According to Michalisim (1997), he pointed out that strategic assets are "simultaneously valuable, rare, imperfectly imitable, and nonsubstitutable". RFID technology has been commonly recognized as the key source to enterprise resource management system as well as warehouse management systems and enables retailers to gain competitive

edges over rivals.

THE CHARACTERISTICS AND DEVELOPMENT OF RFID

RFID is the generic name for technologies that use radio waves to automatically identify items. There are several methods of identifying items using RFID but most systems consist of a tag, which is made up of a microchip with a coiled antenna, and an interrogator or reader with an antenna. The reader sends out electromagnetic waves that form a magnetic field when they 'couple' with the antenna on the RFID tag. The tag draws power from the magnetic field and uses it to power the microchip's circuits. The chip then modulates the waves that the tag sends back to the reader and the reader converts the new waves into digital data. The data transmitted by the tag may provide identification or location details and/or specific information about the product such as price, colour and date of purchase. The tags are very flexible in that microchips measuring less than a third of a millimeter wide can now store a wide range of unique product information, they can be read from a distance and through a variety of obstacles. RFID technology can also allow some, but not all, the data held on a tag to be read and the tags can be updated after the original data has been loaded. The tags also offer security in that they can be made virtually tamper free.

The technology has been too expensive and too limited for widespread mass commercial applications, but as the price of tags, tag readers and the associated equipment continues to fall so a growing number of retailers have begun to explore the introduction of RFID and this in turn seems likely to bring the technology into everyday consumer use.

SIGNIFICANTS OF RFID TECHNOLOGY

Wal-Mart is making this revolutionary technology (i.e. RFID) a reality in distribution centers today. It's expected that Wal-Mart's top 100 suppliers must be 'RFID-ready' by January 2005 and the retailer then put its large foot forward in April of this year by launching the first phase of RFID implementation at the case and pallet level in Fort Worth marketplace. Apparently, the retailing industry is slowly moving toward a re-engineered supply chain with enhanced efficiencies.

RFID represents the most sweeping supply-chain advancement since June 1974, initiated by Wm. Wrigley Company by adopting the world's first, official grocery-store barcode on a pack of chewing gum. Since then, it changes to the way the supply chain operation becomes more efficient. It is evident to note that RFID helps manufactories virtually eliminate manual data entry and manual business process transactions in such ways: first and foremost, order fulfillment speed is dramatically increased; second, the order accuracy is improved; third, the on-going operating costs of order fulfillment are reduced; the performance of warehouse management system investment can be enhanced; last but not least, hidden warehouse management costs become visible. Moreover, efficiency gains can be measured in picking and put away errors, acceleration of handling for return and restocking, and elimination of physical counts.

In addition, RFID enables manufactories to make the most use of data as it becomes available for real-time demand signals when product moves through the supply chain. Furthermore, RFID contributes to the improvements of data accessibility and quality of which having a positive impact on demand forecast accuracy (Smith & Offodile, 2002). Consequently, it helps manufactories to gain real-time visibility into customer purchase decisions throughout the value chain, which prepare firms to react and influence the marketplace.

Cited from Rose (1996), “An inspection of technological changes in terms of supply chain management over the last 20 years has illustrated that there have been tremendous changes in the area of physical distribution or supply chain management systems through global business. Information technology and RFID have changed payables, receivables, and the asset side of inventory. Typically, RFID use modern wireless technologies to provide manufacturers with unique solutions to difficult logistical tracking of inventory. The technology is largely feature in its stability, with open architectures becoming increasingly available.

RFID BENEFITS VERSUS BARCODE

As mentioned above, barcode has been popular in 70s, but now see a downward trend in its application. The rationale of decreasing application of barcode is that RFID allows for non-contact reading of data, which makes it effective for manufacturing and other hostile environment where bar code labels may not perform well. The optical nature of barcode requires labels to be “seen” by lasers. That line-of-sight between label and reader is often difficult, impractical, or even impossible to achieve in industrial environments. In order to function properly, a bar code reader must have clean, clear optics, the label must be clean and free of abrasion, and the reader and label must be properly oriented with respect to each other. In contrast, RFID is established in a wide range of applications. It enables tag reading from a greater distance, even in harsh environments.

Moreover, the information imprinted on a barcode is fixed and cannot be changed. ActiveWave RFID tags, on the other hand, have electronic memory similar to what is in your computer or digital camera to store information about the inventory or equipment. This information can be dynamically updated.

Generally, the advantages of RFID over barcode technology have been summarized

into few points. Initially, no line of sight requirement; second, the tag can stand a harsh environment; third, in a long read range; forth, database is portable; fifth, has multiple tag read/write; last but not least, feasible in tracking people, items, and equipment in real time.

RFID WITHIN RETAILING

RFID certainly seems to have seized the imagination of the retail world. Wal-Mart, the world's largest retailer, for example, has instructed its top 100 suppliers to place RFID tags on all its pallets and cases, though not on individual items, by January 2005. Within the UK a growing number of major retailers including Sainsburys, Marks & Spencers, Asda and TESCO have been experimenting with RFID technology, and it seems increasingly set to replace barcode scanning. A wide range of benefits is being claimed for RFID technology within retailing including tighter control and management of supply chain and of inventory management with attendant cost savings; reduced labour costs; improvements in customer service; reductions in shrinkage; and clearer targeting of customers and tracking of their purchasing behavior.

Initially supply chain applications appear to be the fastest growing RFID usage within retailing and the technology would seem to have potential to revolutionize the efficiency, accuracy and security of the supply chain. RFID tags can be used for example to track the movement of items through the supply chain from production to the check-out point, offering detailed information on trace-ability. Arguably, the more tightly retailers can integrate their supply chains the less the likelihood of errors. The real time data generated by the tags can provide manufacturers, suppliers, distributors and retailers with up to the minute information on inventory, logistics and freshness.

RFID virtually facilitate improved use of warehouse and distribution center space in

the way that goods will not need to be stored according to product type for manual location, but they can be stored in the most efficient manner based on size and shape. As a result, this will enable appropriate warehouse and distribution centre managers to use hand held devices to locate goods and to improve the efficiency of locating and picking goods. Retailers will be able to know where pallets and cases of goods are, to know if they have been stolen or mislaid, to identify products that may have been recalled, to respond rapidly to unforeseen changes in the supply chain, to react quickly to problems within the supply chain, to check on expiry dates and to determine when products will arrive in store. Retailers usually check the delivery of goods into their store manually, but RFID technology will allow goods to be checked automatically and almost instantly.

Within stores, many benefits are also predicted for RFID. For instance, RFID provides much greater security within stores and dramatically reduce shrinkage through in-store theft. It can not only detect if items are being moved from the store without being paid for, but also it can alert security guards if a large volume of particular products have suddenly been removed from a store's shelves in a large-scale shop lifting incident.

Furthermore, RFID technology should dramatically reduce check out times in that customers will be able to push their trolley or carry their basket past a reader and get a complete list of all items purchased automatically charged to the customer's credit or debit card. Retailer will also be able to track products that are selling rapidly and to restock shelves several times a day for those fast-moving-items. In addition, RFID technology can also be used to trigger an interactive display of related products. More generally, it has been argued that the widespread adoption of RFID technology will allow retailers to spend more time selling products rather than stocking or tracking them. As matter of fact, within large stores few managers and employees are able to devote much of their time to sales and selling because most of their time is spend on staffing and managing the checkouts, stocking shelves, managing the product range

and managing departments.

IMPLICATIONS AND RECOMMENDATIONS

While the advent of RFID technology seems to offer a wide range of benefits to retailers, or more accurately, to major retailers its introduction into the UK retail scene is generating a number of strategic and operational issues. However, it should be pointed out that if RFID technology is to revolutionize retailing and if retailers are to gain long-term benefits then they will need to undertake a fundamental strategic review of their business processes and of their relationship with suppliers and distributors. A comprehensive review will be vital here and the accent will need to be on the total costs of establishing an RFID infrastructure throughout the retail supply chain and weighing the attendant costs against the anticipated benefits. At the same time, retailers will also need to reflect on their ability to handle and make effective use of the data captured by RFID systems. These systems will automatically collect a massive and on-going stream of real time data and the storage and transmission of this data will place severe strains on retailers' current ITC infrastructure. There are also concerns about how retailers will manage the sheer volume of data generated by RFID. Meanwhile, retailers will also need to integrate their RFID systems and the data they generate with the other functional databases and applications such as accounts and customer relationship management. The introduction of RFID technology will also generate major training needs for retailers and their suppliers and distributors to allow their employees to use the new systems and master new job functions.

CONCLUSION

The need to present more valuable service for the customers and, at the same time, to

cut the cost of delivery process is the most difficult supply chain management (Christopher, 1992). The advent of RFID technology has been heralded as providing retailers many powerful potential benefits. The benefits achieved by retailers using RFID in their processes are not only to enable automatic goods receipt, but also to expediting inventory counts from shelves as well as major reduction in checkout costs. In addition, the development of new after-sales services using RFID technology can yield substantial new benefit to the customer. To sum up, the biggest benefits of adopting RFID technology in retailing come from the ability to identify products without needing to manually handle them. This enables more efficient processes as visibility to the products in the shelves and in the backroom is achieved. Similarly, the ability to make an inventory count in the households of e-grocery customers also makes totally new service models possible.

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