Chapter 4.3
Using RFID to Track and Trace High Value Products:
The Case of City Healthcare

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EXECUTIVE SUMMARY

Certain businesses call for a high level of traceability to track high value products. This case study of City Healthcare,[1] New Zealand, focuses on the complex management issues related to the initial decisions to use radio frequency identification (RFID) technology on such a product, instead of a barcode. RFID devices are effectively tiny memory storage devices that can be read and sometimes written to from a distance using radio waves through an appropriate interrogation device. RFID devices have been touted as a replacement for barcodes in supply-chain applications. Issues and challenges investigated here include the ability of RFID to replace barcodes, business benefit from technology investment, technology adoption, and the role of external regulations in the adoption process.

ORGANIZATION BACKGROUND

City Healthcare is a designer and manufacturer of healthcare devices. The factory is the only production site for the organisation and overseas offices are supported from here. Sales offices are located in Australia, U.S., UK, France, Germany, and India. All City Healthcare manufacturing line products are uniquely identifiable using barcodes. RFID (radio frequency identification) was not used anywhere in the factory at the time of the case study analysis although management was aware that RFID tags could be used in place of barcodes.

City Healthcare entered the respiratory care market in 1971 with the development of a respiratory humidifier system for use in critical care. It has since developed humidification technologies and now offers products for use in intensive care respiratory medicine, neonatal care,

operating rooms, and the treatment of obstructive sleep apnoea (OSA).

City Healthcare is the tenth biggest company on the New Zealand stock exchange and has 830 staff in New Zealand. The company sells products to 90 markets in Europe, North America, UK, Australia, and Asia, achieving sales of NZ $241 million annually.

City Healthcare spends around 7% of its revenue on R&D and consistently produces new lines and products. The company continually enhances its existing products and develops new, related products, focuses on new medical applications for their technologies and expands their sales network, with the focus on achieving a better patient outcome.

SETTING THE STAGE

As a much cheaper alternative and a requirement by many healthcare governing bodies, barcoding still has precedence amongst healthcare companies over other technologies for identifying products (Best, 2005). RFID may be seen as a replacement for barcodes but manufacturers of medical devices have a lot to consider when adopting RFID technology. Issues include standards, cheaper alternatives, and regulations. For example, in the U.S., medical device manufacturers must get third party approval from regulatory bodies such as the Food and Drug Administration[2] (FDA) to allow them to sell their products. FDA requirements mainly include safety, quality, and standardisation.

Having mastered barcoding technology, companies are in a position to consider the functionality of RFID. In healthcare particularly, RFID is considered more suitable for locating people and products than barcoding and has many potential advantages such as field reading, as opposed to line-of-sight reading. RFID devices can store more data than barcodes and some RFID tags can have data written to them by the interrogator. There has been a great deal of interest recently in the use of RFID in the supply chain (Singh & Lai, 2007), and a number of major projects are underway.

Readiness for RFID in Healthcare

Medical healthcare devices are often high value products manufactured in low volumes with supporting processes that must comply with regulations. There could be catastrophic consequences for a healthcare device manufacturer if a product was involved in a serious accident or other bad publicity. Therefore, regulatory bodies require medical device manufacturers to individually label every product manufactured. Unique identification makes it possible to achieve full traceability and archive test data records in the supply chain. All these factors can affect RFID adoption in the industry and initially suggest that medical device manufacturers have the margins and pressure from external actors to motivate them to invest in the technology (Brooke, 2005). Brooke (2005) identified several aspects of the healthcare industry where RFID can be beneficial, including the ability to trace high value assets in the hospital and the ability to track assets over time, thus verifying that certain procedures have been completed (in this case, decontamination of surgical instruments).

Tracking and Tracing

The supply chain is described by Christopher (2005) as a network (supply chain network) where different actors and functions are working together to control, manage, and improve the flow of material and information from suppliers to end customers. The underlying philosophy behind the supply chain is the logistic concept of planning and co-ordinating the flow of material through a supply chain as a series of dependent activities within functions, with the overall aim of sending the right product, to the right destination, at the right time.