

Chapter 2

Overcoming Visibility Issues in a Small-to-Medium Retailer Using Automatic Identification and Data Capture Technology: An Evolutionary Approach

Dane Hamilton

University of Wollongong, Australia

Katina Michael

University of Wollongong, Australia

Samuel Fosso Wamba

University of Wollongong, Australia

ABSTRACT

In this paper, the authors the inventory control practices of a small-to-medium retailer to identify common challenges this type of organization experiences with respect to automated data capture (ADC) and the implementation of an enterprise wide information system. The study explores a single case of a hardware store in a regional town in New South Wales, Australia. Four semi-structured interviews were conducted with employees, focusing on issues related to inventory control including delivery discrepancies, checking and sorting of orders, locating stock and goods, loss prevention, customer purchasing and point of sale processing and replenishment. Flowcharts illustrate the current processes of the retailer with an understanding of how ADC technologies like bar code and radio-frequency identification (RFID) impact the retailer. The findings promote an evolutionary approach toward the use of automated data capture technology by adopting barcode technology and subsequently introducing the complementary RFID technology.

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1 INTRODUCTION

The aim of this paper is to review the inventory control practices of a small-to-medium retailer and to show how automatic identification and data capture (AIDC) technology can overcome operational challenges. Inventory control is the activity that organizes the availability of products to customers through the coordination of the purchasing, manufacturing and distribution functions (Wild, 1997). The aim of inventory control is to maximize customer service, profit and efficiency of purchasing and production, whilst at the same time minimizing inventory investment. Inventory control practices are significant to all organizations, especially small-to-medium retail enterprises that are more susceptible to inventory control issues (Gunasekaran, Forker, & Kobu, 2000; Zipkin, 2000). Traditionally, to improve inventory control organizations have semi-automated their processes through the implementation of barcode systems. The implementation of barcode technology has translated into operational improvements in the form of superior data accuracy, efficiency, consistency and inventory and asset management within the organization (Ellram, Londe, & Weber, 1999; Zebra Technologies, 2007). However, in more recent times the widespread acceptance of electronic commerce has created a more competitive environment prompting organizations to seek ways to improve operations through the use of information technology.

RFID is an emerging technology that is yet to be proven in retail organizations. RFID can be defined as an electronic tagging technology that allows an object, place or person to be automatically identified using an electromagnetic challenge/response exchange (Want, 2004). Unlike barcodes RFID supports non-line of sight scanning and can record data in real-time (Jones, Clarke-Hill, Shears, Comfort, & Hillier, 2004; Sarma, 2004). RFID systems can function well in harsh conditions, dissimilar to barcode systems (Finkenzeller, 2003; Michael

& McCathie, 2005). For these reasons, numerous authors have heralded RFID as a technology with the potential to provide benefits to retail organizations, especially in relation to inventory control (Garfinkel & Rosenberg, 2005; Heinrich, 2005; Symbol Technologies, 2004; Tellkamp, Angerer, Fleisch, & Corsten, 2005). Potential benefits aside, technical issues, the high cost of the technology, lack of standardization and privacy concerns have negatively influenced its uptake, rendering it impractical for many organizations, especially those that are small-to-medium in size. This paper examines the inventory control practices of a small-to-medium retailer, as well as discussing the potential for RFID to improve inventory visibility.

2 LITERATURE REVIEW

2.1 Automatic Identification and Barcoding

Inventory systems are used by organizations to maintain control over their materials and products. Traditionally, to improve inventory control and inventory systems, organizations have semi-automated their processes through the implementation of barcode systems. Bar coding is a form of automatic identification that collects data through keyless entry. The barcode is essentially a binary code that is comprised of a pattern of bars and gaps arranged in a parallel configuration (Palmer, 1995). The information stored by barcodes is captured in 'line of sight' by optical readers, one barcode at a time. The first bar code system was developed in the United States of America during the late 1940's by Sylvania/GTE applied Research Lab. This system was used in the rail industry, aimed at controlling freight cars. The system utilized a white light optical scanning system to illuminate horizontal bars of reflective red, white and blue on non-reflecting black background (Collins & Whipple, 1994). Since its inception the barcode

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