Contemporary IT-Assisted Retail Management

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INTRODUCTION

Retailing can be defined as a set of specific business processes that add value to products and services sold to end users (e.g., Levy & Weitz, 2003). Such retail business processes refer to *marketing processes* (like assortment in order to provide end users with a required mix of products and services in terms of quantity as well as quality; and advice, advertising, and credit processes, which ease the purchase for end users, for example, offering special payment modes or informing end users about the offers) and *logistics processes* (such as transportation, breaking bulk, and inventory handling). The orchestration of these functions leads to various types of retail formats such as store-based retailers (e.g., supermarkets, hypermarkets, or category killers), non-store-based retailers (e.g., mail-order retailing or electronic commerce), and hybrid retailers (e.g., home delivery services or party sales services; Coughlan, Anderson, Stern, & El-Ansary, 2001).

Although retailing plays a vital role in today's economy, retailing companies also face economic pressure as many players operate mainly in mature and stagnant markets (e.g., Seth & Randall, 2001). In order to face these specific challenges, retailing companies adapted strategies that allow them to gain economies of scale by offering highly customized solutions to their customers (see Table 1).

These strategies are called IT-assisted retail management strategies as they are built upon the latest developments in information technology (IT). The following chapter presents an overview of contemporary IT-based retail business models and frameworks that show how IT has created a new mandate for retail management. IT is defined here as the hard- and software that collects, transmits, processes, and circulates pictorial, vocal, textual, and numerical data and information (e.g., Hansen & Neumann, 2001; Chaffey, 2004). The following are technologies of special interest used in IT-assisted retail management.

- Mobile data-capturing terminals, light pens, bar-code readers, bar-code labels, disks, chip cards, RFID (radio frequence identification), sensors to collect information
- Database systems, tapes, CDs, DVDs, optical disks, document-retrieval systems to store information
- PCs, information retrieval, decision support systems, expert systems (MIS, EIS, MSS, ESS to process information)
- Services (e.g., fax, e-mail, EDI [electronic data interchange], Web-EDI, FTP, WAIS, World Wide Web, SMTP, TCP/IP), networks (videoconferencing, teleconferencing, voice mail, ISDN, LAN, WAN, fiber optic, and intra-, inter-, and extranet), devices (e.g., phones, TV, radio, fax machine, PC, PDA [personal digital assistant]) to transmit information

The increasing use of these technological possibilities leads to major changes in the strategic management of distribution channels as the layers are compressed and the distances between the first and last echelon of the channel are reduced (e.g., Coughlan et al., 2001; Porter, 2001). Leading retailers are aware of these possibilities and implement customized POS-data-based marketing strategies (IT-based retail marketing) and demand syn-

Table 1. Cornerstones of contemporary IT-based retail management (see Kotzab, Schnedlitz, & Neumayer, 2003)

IT-based retail marketing strategies	IT-based retail logistics systems
• Reengineered, IT-driven retail formats allowing a customized shopping experience • Development of new retail channels, e.g., Internet-based retail formats to address new customer segments • Category management in order to offer client-oriented sets of products, resulting from a joint-planning process with manufacturers based on real-time accessed client data	• The implementation of just-in-time-oriented replenishment systems by connecting the electronic point-of-sale (EPOS) systems with the manufacturers' ERP systems • The execution of IT-driven distribution-center operations with no-inventory-holding transit terminal structures • The realization of vendor-managed inventory programs on a continuous–replenishment basis to reduce inventory levels and to improve order cycles

chronized replenishment systems (IT-based retail logistics).

BACKGROUND

IT-Based Retail Marketing Processes

Business practice shows a huge variety of IT-based retailing marketing strategies that includes the use of smart cards, theft prevention, self-checkout systems, Web kiosks, and/or merchandise-planning systems. The common goal of all strategies is to obtain better information on consumer behavior in order to improve customer service. IT-based retail marketing affects in that sense all retail areas from the sales floor to the back offices (Kotzab, Schnedlitz, et al., 2003).

Referring to store-based retailing, IT influences the layout and the atmosphere of a store by optimizing the link between sales productivity and consumer excitement (Nymphenburg, 2001). Metro introduced recently its future store concept that promotes technologically driven innovations in IT-assisted retail marketing as offered by the combined use of RFID, electronic shelf labels, self-checkout systems, personal shopping agents, in-store media such as info terminals, loyalty cards, personal shopping assistants for shoppers, personal digital assistants for employees, and intelligent scales (e.g., Metro, 2003; NCR, 2003; Ody, 2002).

Another prototype of a modern supermarket can be found in Austria (see Kotzab, Schnedlitz, et al., 2003), where Rewe Austria operates in Purkersdorf (nearby Vienna) an outlet where shoppers self-register their purchases via self-scanning devices. Rewe also uses the "talking" or "communicating" shopping cart WATSON, whose technology is based on radio frequency. Whenever passing a labeled shelf, the cart announces a message to the shopper (Atlas New Media, 2001).

Other recent examples are presented by Carter and Lomas (2003), who refer to a Sainsbury store in Hazelgrove (UK) and a Darty store in France that represent the state of the art of technology-driven store layout.

IT also changed the organizational setup from hierarchical to hybrid or borderless arrangements such as category management (CM; Gruen, 2002). CM is a joint retailer and manufacturer effort that involves managing product categories as business units and customizing them on a store-by-store basis to satisfy end-user needs (Dussart, 1998). The purpose is to identify those combinations of products that make up consumers' expectations. CM replaces traditional product-focused strategies (e.g., brand management) and allows retailers and suppliers to faster react to shifts in the marketplace (Schröder, 2003). The increasing use of data-warehousing and data-mining approaches helps to use the scanner data more efficiently in order to establish customer-oriented assortments (Chen et al., 2000).

The RFID technology (e.g., AIMGLOBAL, 2004; Öztürk, 2003) especially seems to change retailing marketing but also logistics dramatically. The Exxon Speedpass program might be the new way of cashless payment as immediate authorization is possible and it reduces the waiting time enormously (Speedpass, 2003). Metro's future store concept also shows that self-scanning processes can also be replaced by RFID. Wal-Mart, however, intends to implement RFID with about 100 vendors in order to improve the replenishment processes (Ashcroft, 2003).

IT-Based Retail Logistics Processes

Logistics in a retailing context refers to multiechelon logistics systems with many nodes from the original supplier to the final store destination (Kotzab, 2002). The use of specific IT in retail logistics, such as EDI (e.g., EANCOM, EDIFACT, ANSI X.12), bar codes (e.g., EAN/UCC) and scanner technology, converted traditional retail logistics systems into just-in-time-oriented retail supply chain management systems. A channel-wide use of technology allows harmonization and synchronization of logistics operations between retailers and their suppliers, and give retailers additional profitability as such systems operate on a pull instead of a push base. Consequently, the total bullwhip effect in such channels is reduced (Lee & Whang, 2002).

The major IT-assisted retail logistics processes are cross-docking and continuous replenishment (Kotzab, Schnedlitz et al., 2003), and recently collaborative planning forecasting and replenishment (CPFR; Skjoett-Larsen, Thernoe, & Andresen, 2003).

Cross-docking is the metaterm for all IT-related flow-through activities within a distribution center that provide tailor-made deliveries on a just-in-time basis. Different vendors deliver full truckloads of their goods to a retailer's transit terminal (a reengineered distribution center; also called a transshipment point). The goods are there consolidated and/or broken to vendor-integrated, POS-required smaller delivery units (see Figure 1).

Cross-docking's basic idea is to avoid inventory at the distribution-center level, which leads to a lot of replacement of stock-holding activities through sorting, transportation, and handling activities, which are controlled by increased use of IT (e.g., EAN/UCC 128 in combination with EANCOM messages). The relevant literature offers various types of cross-docking operations depending whether vendors deliver prelabeled units