Contemporary IT–Assisted Retail Management

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INTRODUCTION

Retailing can be defined in two ways, either as a set of functions that adds value to products/services that are sold to end users (functional understanding of retailing) or as a specific institution within a marketing channel that executes retail functions (institutional understanding). The functional view explains retailing as an exchange activity in order to connect a point of production with a point of consumption. These exchange processes refer to (see Kotzab & Bjerre, 2005):

*   Marketing processes, including all activities that provide a customized set of products/services as demanded by customers/consumers (which is basically known as offering a customer-oriented assortment in terms of quality and quantity)
*   **Logistics** processes, including all activities that help to transfer this specific set of products/services to the markets (such as transportation, breaking bulk and inventory management)
*   Assisting processes, which refer to all activities that facilitate a purchase (such as credit function, promotion or advice function).

The orchestration of these functions leads to various types of retail formats such as store-based retailers (e.g., hypermarkets or category killers), non-store-based retailers (e.g., mail-order retailing or electronic commerce) and hybrid retailers (e.g., home delivery services) (Coughlan et al., 2006).

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

These strategies are built upon the latest developments in information technology (IT) and are therefore called IT-assisted retail management strategies. The following chapter presents an overview to 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 hardware and software that collects, transmits, processes and circulates pictorial, vocal, textual and numerical data/information (e.g., Hansen & Neumann, 2005; Chaffey, 2004).

The following IT is of special interest in relation to IT-assisted retail management:

*   Mobile data capturing terminals, light pens, bar code readers, EAN.UCC 128, labels, disks, chip cards, RFID, EPC, sensors to collect information
*   Data base 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, email, EDI, web-EDI, FTP, WAIS, WWW, SMTP, TCP/IP, XML, VAN, GPS), networks (videoconferencing, teleconferencing, voicemail, ISDN, LAN, WAN, fiber optic, intra-, inter- and extranet) and devices (e.g., phones, TV, radio, fax machine, PC, PDA) to transmit information

The increasing use of these technological possibilities has led to major changes in the strategic management of distribu-

Table 1. Cornerstones of contemporary IT-based retail management (see Kotzab & Bjerre, 2005)

IT-based retail marketing strategies	IT-based retail logistics systems
• Re-engineered IT-driven retail formats, allowing for 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

tion channels as the layers are compressed and the distances between the first and last echelon of the channel are reduced (e.g., Porter, 2001 or Coughlan et al., 2006). Leading retailers are aware of these possibilities and have implemented customized POS-data based marketing strategies (IT-based retail marketing) and demand-synchronized replenishment systems (IT-based retail logistics).

BACKGROUND

IT-Based Retail Marketing Processes

Business practice shows a huge variety of IT-based retailing marketing strategies including the use of smart cards, theft prevention, self-check-out systems, web-kiosks and/or merchandise planning systems. The common goal of all these strategies is to obtain better information on consumer behavior in order to improve customer service. In that sense IT-based retail marketing affects all retail areas from the sales floor to the back offices (Kotzab et al., 2003a; Kotzab & Bjerre, 2005).

IT influences the layout and the atmosphere of a retail store by optimizing the link between sales productivity and consumer excitement (Nymphenburg, 2001) as the following examples show:

- Metro operates the 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 check out systems, personal shopping agents, instore media such as info terminals, loyalty cards, personal shopping assistant for shoppers, personal digital assistant for employees and intelligent scales (e.g., Metro, 2003, Kotzab & Bjerre, 2005).
- Rewe Austria operates an outlet in Purkersdorf (nearby Vienna), where shoppers self register their purchases via self scanning devices (see Kotzab et al., 2003a). Rewe also uses the "communicating" shopping cart WATSON, which uses a technology based on radio frequency. Whenever passing a "labeled" shelf, the cart announces a message to the shopper (Atlas New Media, 2001).
- Since 2004, Spar-Austria has run a modern supermarket in Mattighofen (near the city of Salzburg) with self-check-out, cash-back terminals, instore-videos and intelligent scales (Spar, 2004).
- Zielpunkt/Plus of the German Tengelmann-Group installed self-check-out systems and cash-back terminals in one Viennese store (Weber, 2004).
- Carter & Lomas (2003) present the Sainsbury store in Hazelgrove (UK) and the Darty store in France, that both represent the state-of-the art of technology driven store layout.

- Weber (2006) reports on the experiences of Belgium Delhaize group which has used Wincor-Nixdorf hand-held self-scanning devices since 1997 in their stores which allow customers to scan their items while they are shopping. According to Delhaize, 26 % of all sales are registered with those systems. Mobile self-scanning has allowed Delhaize to install quick shopping lanes within the stores in order to increase throughput times of customers.
- The French retailer Auchan is testing in France so-called scan & bag technology, which is an automated cash-desk system. Auchan operates 166 self-service cash-desks in different stores in Italy (Weber, 2006).

IT has also changed the organizational set up from hierarchical to hybrid/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 market place (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). Recently, Kahler & Lingenfelder (2006) were able to identify a strong relationship between the category value for money and store loyalty as CM incorporates the consumers' views and perceptions.

Finally RFID-technology is not only going to retail marketing but also logistics dramatically (Finkenzeller, 2003). Metro's future store concept shows that self scanning processes can be replaced by RFID which reduces waiting times for customers. Du Mont & Hoda (2006) present the case of the Japanese Mitsukoshi who uses RFID technology for an intelligent fitting room in order to enhance customer service. Especially industrial initiatives such as the EPC-Global, a joint venture between EAN International and the UCC, have developed so-called electronic product codes (EPCs), which will increase the diffusion of RFID-technology in the retail industry (see Jordan & Adcock, 2006). EPC is an RFID-based advanced UPC-bar code with the benefit of being able to identify articles at the item level uniquely (Verisign, 2004). The power of such a code can be illustrated by the following quote: "Using this EPC, members of the supply chain can thus identify and locate information about the manufacturer, product class, and instance of a particular product. Depending on the type of tag, EPC can be used to uniquely identify up to 268 million unique manufacturers, each with 16 million types of products. Each unique product can include up to 68 billion individual items, meaning the format can be used to identify hundreds of trillions of unique items" (Verisign, 2004, p.2).

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