

# Omni-Channel Retail Information Systems

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## INTRODUCTION

Information systems in the context of retailing are, though often overlooked as such, some of the most complex systems in the corporate information landscape – this solely on the basis of their geographical and probably also cultural span across nations, traditions, fiscal systems and workforce regimes (Joshi, 2009; Tambo, 2011). When retail information systems are expanded into being able to consistently handle the same information seamlessly across different sales channels, trading platforms, consumers group and logistical systems, then the complexity is increased by yet a magnitude (Ebeltoft Group, 2012; Frei et al., 2012). Contemporary retailing must be understood in the light of its technological character (Wightman, 1990; Heinemann & Schwartzl, 2010).

Cross-channel or multi-channel retailing has normally reflected sales of physical or non-physical goods in stores and Internet-based shops (Hadley, 2012; Williams, 2008). It has also reflected conceptually similar channels, e.g. the physical store could also be a concept store, a shop-in-shop, a trade fair booth, and the virtual store could, for instance, also be a TV-shop and a mobile commerce platform. Especially digital channels are growing in number and format, introducing social media commerce (Stephen & Toubia, 2009), e-shop-in-shops, gaming, social and professional communities, co-creation and various combinations of existing channel formats (Hansen & Tambo, 2011). Cap Gemini (2010) lists new digital channel formats such as highly interactive social networking, personalised e-zines, personal promotions based on situations, intelligent search optimisation, online comparison of competitive products and personalised mobile phone marketing.

Recently, the concept of omni-channel retailing has been introduced (Aberdeen Group, 2012; Arthur, 2012; Bomber & Caudhill, 2012; Demsey & Dunlap, 2012; Edelson, 2012; Elliot et al., 2012; Hadley, 2012;

Harris, 2012; Winter, 2012; Wheeler, 2012). Omni-channel retailing is met with interest from key players in the industry of retailing (Wilson, 2012; Verizon, 2012) and covers the idea that anything can be sold anywhere with consistent marketing, reasonable efficiency of the supply chain channels and responsible customer service. This article aims at contributing to a characterisation and definition of omni-channel retail information systems (OCRIS) by using the information systems research tradition as a distinctive starting point (Treiblmaier & Strebinger, 2008; Avgerou, 2001; Parboteah et al., 2009). Omni-channel retailing has evolved since 2010 with the ultimate aim of aligning physical and digital sales channels by the use of technology, thus providing uniform customer experience and operational effectiveness across the channels (Hansen & Tambo, 2011).

The vision of OCRIS remains largely at a conceptual level. Selected point-of-sale (“cash registers”) products and retail management systems have been introduced to be able to cope with the challenges of OCRIS. However, as a business strategy, it is still evolving and not many of the actual implementations have been able to fully realise the vision.

The customers’ buying patterns are changing (Westenberg, 2010; Schröder & Zaharia, 2008; Chang et al., 2005). E-commerce is developing with double-digit growth figures, while physical retailing is largely at a standstill with several sectors in decline. “Traditional” e-commerce operations are, nevertheless, also challenged by diversities of new channel evolution (Tambo & Hansen, 2012). Rigby (2011) discusses the future of shopping in terms of metrics of sectors moving from analogue retailing into digital formats. The suggested metrics are price, selection, convenience and trust, with books as the definitive product and fashion/apparel as rapidly upcoming. Rigby (2011) suggests that traditional retailers re-invent shopping, making it a more complete consumer experience by bringing

different channels into play. The retail analyst GfK (2012) has found that shoppers of tablet computers consistently visit several channels before buying.

Omni-channel retail information systems (OCRIS) are important as systems supporting the diversity of channels that otherwise tend to optimise operations on channel level and either provide a dissatisfactory customer service on different channels or lack support of internal operational requirements. Of today's solutions of multi-channel retailing, isolated functionalities are well-supported, e.g. prices, product descriptions or discount models, but other functionalities might be missing, e.g. inventory reconciliation, returned goods handling or loyalty programmes. The channel service design, the associated data and business logics and the interrelations between back office functions and the retail operations are critical aspects of OCRIS along with keeping data and data-flow persistent in time and across channels. This article is a qualitative study of the omni-channel retailing phenomenon, mainly based on the general studies of technology and the strategic changes within business and technology in retailing. The qualitative approach is chosen due the emergent character of the OCRIS with a general lack of consensus on the definition of the engaged or assumed IS functionalities. This approach is furthermore suitable for collecting data from the relatively limited number of "true" full-scale system implementations. The present article is based on an extensive literature review: Given the empirical nature of omni-channel retailing, a larger part of the references are from industry observers, blogs, industry associations etc. A number of articles on general strategic considerations of e-commerce are also included. A qualitative study is presented on a hypermarket chain transitioning from parallel sales channels into seeing omni-channel retailing as a strategic goal. The longitudinal and interpretivistic approach of the data collection has allowed to follow the chain as a case with individual information systems as the technological artifacts within the sales channels. The partial use of drop-shipping (passing sales orders to external parties for fulfilment) further includes external distributors. Business process mapping, interviews, warehouse inspections, supplier dialogues and user tests have been applied to collect data that subsequently has been reviewed with respect to extract and project the cross-channel systems toward the omni-channel construct.

## BACKGROUND OF RETAIL TRANSFORMATION



The standard design of physical retail information systems includes headquarter systems for supply chain management and corporate finance as well as in-store systems, predominantly the point-of-sale (POS) system (Heinemann & Schwartzl, 2010; Joshi, 2009). E-commerce infrastructure will normally have a layered architecture with web fronts, customer relationship management (CRM) and product data management (PDM) systems, a fulfilment system and the corporate finance link. Multi- and cross-channel retailing suggests an interaction between these two architectures, typically with a limited number of data integration processes.

Multi-channel retailing has become commonplace in several sectors of retailing (Zhang et al., 2009; Bagge, 2007). With multi-channel retailing, several processes will be aligned between physical and online retailing, e.g. branding and product data. Multi-channel retailing is, however, typically unsuccessful when it comes to the breadth of processes and the "true" alignment between channels. For example, a customer service agent in a physical store may be unaware of a product sold online only, and there might be different product assortments, prices and terms across channels. Kwon and Lennon (2009) discuss the negative effects of consumer experience across channels.

Shankar and Yadav (2010) introduce the major changes in retail marketing driven by technology, bringing multi-channel as well as multimedia into play. In addition, they discuss disruptions in business and society that stem from technological shifts (Dholakia et al., 2010) organised in accordance with business strategy (Zeng et al., 2008). Diana (2012) calls for technological designs holistically addressing the strategy challenges of the companies and relates this to changes in insurance, banking, publishing and telecom, where newcomers and omni-channel approaches are actual or potential game changers.

The value of e-commerce and more complex technology-based retailing environments is substantiated in Wang's (2008) analysis, which combines DeLone and McLean's information systems value creation model with Seddon's technology acceptance model and suggests information quality, system quality and service quality as critical factors.

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