



## Information and communication technology in retailing: A cross-industry comparison

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### ABSTRACT

Information technology (IT) may represent a source of competitive advantage for businesses in general and for retailers in particular. However, there is debate in the literature over the usefulness of investing in technology. This paper aims at analyzing the relationship between consumers' perception on the use of information and communication technology by the retailer and consumer satisfaction with retailer technologies. Results support the need to restrict the investment in IT to what is strictly necessary, although there are significant differences according to retailer activity.

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### 1. Introduction

Organizations must cope with an increasingly changing environment. Such a change derives essentially from the evolution and changes in customers' needs, technological advances to satisfy those needs and the evolution in business management (Porter, 1997).

A study of successful retailers reveals that the business ability to build and defend a competitive position in the market depends to a great extent on the capacity to invest and use information (Weber and Kantamneni, 2002). In this regard, Buxmann and Gebauer (1999) consider information technology to be a key factor for the organization's success.

Advances in information technologies (IT), such as customer relationship management (CRM), enterprise resource planning (ERP), quick response technologies (QRT), point of sale (POS), universal product codes (UPC), radio frequency (RFID) and payment methods, offer new possibilities for the management of retailing companies. The need to investigate these possibilities in the field of logistics from a marketing channel approach has been raised by several researchers. In particular, Dresner and Xu (1995), Luque (1995), Denis and Czellar (1997), Van der Veeken and Rutten (1998) and Mentzer and Williams (2001) have highlighted the need to research different aspects of the logistics function such as quick response, physical delivery and information system management. Nevertheless, research in these areas is still scarce.

Some authors, however, warn about the risk of "overengineering" or investing excessively in technology (Sethuraman and Parasuraman, 2005), pointing out that good technology is "appropriate"

technology. In contrast, practitioners tend to consider that more technology is always preferable to less technology (Palmer and Markus, 2000). To evaluate this aspect, it is essential to measure the effects of IT solutions on perceived quality and consumer satisfaction (Gurau and Ranchhod, 2002; Weinstein, 2002; Servera et al., 2006). Little attention, however, has been given to customer satisfaction with technology-based improvements and/or upgrading of existing services (Timmor and Rymon, 2007) and the differences across service activities (Drennan and McColl-Kennedy, 2003), even though both factors should be considered in investment decisions. In fact, several types of retailers analyzed in the literature present peculiarities (Berry and Barnes, 1987) that may make difficult the extrapolation some investment patterns to other retail activities.

Focusing on retail distribution, the present paper aims at testing empirically for differences in customer perception and evaluation of the retailer's IT solutions according to retail activity, as well as assessing the influence of the use and evaluation of the those technologies on consumer satisfaction. We attempt to identify the most relevant technologies for four types of retailer: grocery, clothing and footwear, electronics and electrical appliances, and furniture and decoration.

In order to achieve this aim, the present paper is structured as follows. The existing IT literature in the context of relational marketing is revised below. Section 3 describes the methodology used. This is followed by the presentation and the discussion of the results. Section 5, the final part of the paper, contains the conclusions, limitations and new research lines.

### 2. IT in the context of relational marketing

Following Ryssel et al. (2004, p. 198), information technology (IT) is "a term that encompasses all forms of technology utilized to

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create, capture, manipulate, communicate, exchange, present, and use information in its various forms (business data, voice conversations, still images, motion pictures, multimedia presentations”, etc.).

The literature considers information technologies to be an important source of competitive advantages for the company. Generalized use of IT has involved a deep change in an increasing number of business areas, with logistics as one of the areas that has benefited most (Gil et al., 2007). In particular, logistics activities, such as order follow-up, stock management, storage and transportation, make use of the new possibilities of information systems to articulate new types of relation in marketing channels.

Among the benefits derived from IT solutions for the retailer, the literature mentions the following: time savings, lower personnel costs, reliability, accuracy, error reductions, improvements in inventory management (Ellram et al., 1999; Lawson, 2001), as well as increased productivity through the mechanization of labour-intensive tasks (Dadzie and Johnston, 1991).

From the customer's point of view, information and communication technologies allow improvements in retailer service (Ellram et al., 1999; Lawson, 2001; Servera et al., 2006), saving shopping time through a wider assortment and one-stop shopping (Messinger and Narasimhan, 1997). In this sense, IT solutions for logistic processes have a positive influence on the value of the retailer's relationships with its customers as well as with its providers (Lewis, 2001; Lewis and Talalayevsky, 2000; Mentzer and Williams, 2001; Gil et al., 2007).

In sum, IT solutions for logistics generate efficiency improvements in the internal processes. This progress will affect positively end consumer experience (Gurau and Ranchhod, 2002; Weinstein, 2002), leading to higher satisfaction levels (Bitner et al., 2002) and higher perceived quality (Servera et al., 2006).

The importance of certain advantages and/or disadvantages depends on the type of technology and its use. In this regard, the literature distinguishes between in-store and out-store logistics (Samli et al., 2005). While in-store logistics is defined as actual handling, arranging, ordering and processing merchandise within the store, out-store logistics is defined as the movement of large volumes of merchandise, its storage and delivery to the store (Samli et al., 2005). In-store logistics can generate more value to the customer in terms of ease of shopping and pleasant ambience, among other psychological factors derived mainly from order and goods preparation, handling and processing. Out-store logistics focuses on cost cutting and generating better financial choices for the customer through goods transportation, storage and delivery.

For in-store logistics, the main IT solutions are customer relationship management (CRM), enterprise resource planning (ERP), quick response technologies (QRT), point of sale (POS), universal product codes (UPC), radio frequency (RFID), methods of payment through use of IT (mobile payment, Internet payment, bank transfer), among others (Ellram et al., 1999; Lawson, 2001; Savage, 2002; Weber and Kantamneni, 2002; Jones et al., 2005a, b; Liljander et al., 2006; Observatorio, 2006). These solutions allow the retailing company to improve its internal organization, business processes and communications with suppliers and customers, as well as to save management and communication costs and to offer new products and services (Observatorio, 2006).

Practitioners maintain that more and higher levels of technology are always better than lower levels of technological development. Nevertheless, academicians argue that good technology is an “appropriate” technology.<sup>1</sup> In other words, companies should only adopt the technologies that suit their specific strategic aims. Some authors alert to the risk of overengineering or investing excessively in technology (Sethuraman and Parasuraman, 2005).

In this sense, Palmer and Markus (2000) find more support for the opinion of the professionals rather than the academicians. In particular, with low initial levels of technology, the implementation of new technologies improves performance, whereas with high technological levels, such an improvement is not observed.

In order to assess customer's perception of retail technology, two main dimensions have been identified: IT advancement and IT alignment (Hausman and Stock, 2003; Wu et al., 2006). IT advancement has been defined as the extent to which a firm adopts the most sophisticated technology as a measure of company proactivity in adopting and implementing IT to offer solutions to customers ahead of competitors (Wu et al., 2006). IT alignment is defined as the extent to which a firm's IT is compatible with that of its channel partners, including their customers (Powell, 1992).

Furthermore, following Berry and Barnes' (1987) typology, there is a distinction between *high-touch* retailers, i.e. characterized by a high level of personal contact with customers through personal selling and advice and customized services, and *low-touch* retailers which emphasize the use of self-service technologies. Similarly, Meuter et al. (2000) have distinguished between interpersonal and self-service encounters. In this sense, we understand that according to the type of product distributed by the retailer, there is a different degree of contact between customers and vendors and, thus, there may well be differences in the level of use of retailer technology depending on the type of retail activity.

Since the relative importance of the benefits sought by consumers differs between *high-* and *low-touch* retailers, we expect that the same technology solutions may be differently appreciated depending on the type of retail activity in which they are implemented. In this sense, it has been observed a higher relevance of the relational benefits perceived by the customer in *high-touch*, customized, personal services, in comparison to *low-touch* services (Patterson and Smith, 2001; Kinard and Capella, 2006). Since self-service is the sales system in most of the grocery, clothing and footwear retailers analyzed, we expect some IT solutions, e.g. self-service technologies, to be used to a greater extent. On the other hand, for durable goods retailers, i.e. electronics/electrical appliances and furniture/decoration, higher customer involvement is expected in the purchase process and sales systems based on customization and personal selling. Thus, we hypothesize:

**H1.** Intensity of use of retail IT solutions differs across retail activities.

**H2.** Evaluation of retailer technology differs across retail activities.

Furthermore, although there is a consensus in the marketing services literature that consumer reactions to services are affected by satisfaction (e.g. Cronin et al., 2000), little attention has been given to customer satisfaction with service improvements (Timmor and Rymon, 2007). Since technology can enable increased levels of service through greater customization and flexibility (Bitner et al., 2000), we expect customer satisfaction to be positively affected by service improvements reached, thanks to the technological solutions implemented by retailers. Nevertheless, differences in perceived IT performance have been detected across service industries (Drennan and McColl-Kennedy, 2003) and thus, customer satisfaction with the retailer's technology might show differences across retail activities. In this sense, we hypothesize:

**H3.** Customer satisfaction with retailer technology differs across retail activities.

<sup>1</sup> For a review of the literature, see Palmer and Markus (2000).

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