

# Impact of E-Commerce in B2B Physical Distribution: Diffusion of Innovations Perspective

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## INTRODUCTION

The use of e-services in business transactions has brought several advantages to both service providers and customers in various application contexts (Kwon et al., 2009). The service provider benefits from e-services in the form of lower operating costs, reduced cycle times and improved service levels, which in the end increase competitive advantage (Kumar and Petersen, 2006), while customers benefit in the form of increased information availability and visibility (Golicic et al., 2002), ability to make comparisons between alternatives (Longmate et al., 2000), convenience (Surjadjaja et al., 2003), and reduced processing errors (Croom & Johnston, 2003). However, despite these advantages, the adoption of e-commerce by customers has been subject to some limitations. Customers may prefer using traditional means of services because of self-related reasons, such as pre-formed habits of using the same systems, lack of awareness about e-services, and lack of previous experience with e-services or even lack of awareness of internet in general (Deeter-Schmelz et al., 2001; Liang & Huang, 1998). They may also resist using e-services because of lack of human-to-human contact (Yang et al, 2006), which would eliminate the expertise and reassurance of salespeople.

Being a new innovation in certain parts of the world, e-commerce diffuses slowly in these parts and its adoption by customers depends on the benefits they perceive in terms of several innovation attributes such as observability of the relative advantage of e-services over traditional means of transactions (Rogers, 2010). The theory of diffusion of innovations (Rogers, 2010) is thus useful in understanding the level of adoption of e-commerce by customers. This chapter draws on this theory to study how the provision of e-services helps improve the link between service factors and customer satisfaction.

This chapter contributes to the literature by addressing two main areas, namely, (i) drawing on the diffusion of innovation theory for understanding the role of e-services in enhancing customer satisfaction and (ii) focussing on a B2B setting. This is done by studying how e-commerce activities of a physical distribution (PD) firm help improve the link between some service factors and satisfaction of its B2B customers.

## LITERATURE SURVEY AND HYPOTHESES DEVELOPMENT

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### Service Attributes Leading to Customer Satisfaction in Physical Distribution Services

Distributor/wholesaler channel systems are the ones that include a manufacturer, a distributor, and the distributor's customer, where the manufacturer sells product to the distributor, sometimes called a wholesaler, who sells to business customers (Maltz & Maltz, 1998). Inventory stocking, product availability, final delivery, and other basic aspects of customer service are some important responsibilities of distributors (Maltz & Maltz, 1998). Mentzer *et al.* (1989) highlight the importance of individual order cycle, starting from order placement and concluding with satisfactory delivery. Achieving high quality in PDS is critical in B2B settings (Perreault and Russ 1974), because a firm's improved performance in terms of the service attributes can help differentiate itself from competitors (Xing and Grant, 2006).

Daugherty *et al.* (1998) found 11 attributes relevant to PDS – fill rate, orders shipped complete, cycle time consistency, cycle time length, delivery on due date, frequency of deliveries, communication of problems/changes, invoice accuracy, usage of advance shipping notices, usage of preferred carriers, and willingness to customize service. Similarly, Mentzer *et al.* (1999) found 9 attributes, including information quality, ordering procedures, ordering release quantities, timeliness, order accuracy (reflecting product availability), order quality, order condition, order discrepancy handling, and personal contact quality.

### Groups of Service Attributes

There seems to be a general agreement in the literature on various service attributes leading to customer satisfaction in the physical distribution services. Many research studies have focussed grouping these attributes into smaller number of factors to facilitate further analysis. For example, Rabinowich and Bailey (2004) found three groups of attributes (pricing, transaction attributes such as order size, firm attributes such as experience, size and downstream channel configuration) to be important in influencing PDS quality. Grouping attributes into factors facilitates further analysis in research studies. For example, by grouping service attributes into order fulfilment and order procurement factors, Thirumalai and Sinha (2005) have shown that the significance of the order fulfilment factor differed among three product groups – convenience, shopping and specialty. Since the level of diffusion of e-services is the main objective of the present study, we attempt to group service attributes into factors that differ in terms of the impact of e-services. Note that while some service attributes aim at improving customer service through better communication and responsiveness in reaching them, other factors are related to operational issues such as improved order processing and logistics issues (Stank *et al.*, 2003). Accordingly, it is proposed in this chapter that service attributes could be grouped into three factors: order processing performance, logistics performance and customer service. E-services readily substitute order processing activities, partially substitute logistics activities (only warehousing part but not physical delivery part), but e-services cannot readily substitute customer service that requires higher levels of human interaction. This study captures these factors (order processing, logistics performance and customer service) using scales developed in previous studies.

Good performances in terms of the above service factors influence customer satisfaction positively (Daugherty *et al.*, 1998; Innis & La Londe, 1994; Stank *et al.*, 2003; Ramanathan *et al.*, 2010). In line

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