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Does knowledge management facilitate logistics-based differentiation? the effect of global manufacturing reach

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ABSTRACT

Global supply chain managers are faced with operational challenges due to emerging factors such as the lengthening of supply chains, worldwide sourcing, and the necessity for mass-customized manufacturing, which have led to commoditization of many products and services. As a result, many firms struggle to compete based on product/service or price attributes, but are able to differentiate versus their rivals based on logistics service and the knowledge management practices that support it. The prevailing logistics knowledge management models fail to account for the extent to which firms maintain a global production presence in local markets – designated here as global manufacturing reach – which is posited to increase logistics-based differentiation due to geographic concentration of logistics-focused assets and processes. The purpose of this research is to examine the combined impact of global manufacturing reach and logistics knowledge management on firms' ability to differentiate based on logistics.

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1. Introduction

Demanding customers, heterogeneity and variability in customer demand patterns, short product life-cycles, product proliferation and customization, rapid innovation, and increasing geographical dispersion of buyers and suppliers are now daily discussion points – and often headaches – for contemporary supply chain managers (Bozarth et al., 2009; Kouvelis et al., 2006). The confluence of these forces yields hypercompetitive markets served by global industries: circumstances where worldwide sourcing, mass-customized manufacturing, and the related commoditization of offerings often leads to little differentiation among competing firms along traditional marketing dimensions such as product and price (Anderson and Parker, 2010; Cheung et al., 2010). Under such conditions, staying competitive often means firms must become better at executing distribution strategies than rivals (Cheung et al., 2010), and logistics service has become a key function of effective supply chain management. Organizations that can accomplish on-

time delivery of complete shipments, in perfect condition, at the optimal time and to any worldwide customer location, can use this capability as a means of differentiating themselves from the competition, sometimes with overwhelming results. For example, Dell Computer radically altered the global PC industry with its ability to offer consumers an affordably priced customized computer that is shipped to their door in a matter of days. The computer itself was not necessarily innovative; Dell's comparative advantage was tied to rapid customization, customer service, and speed and accuracy of delivery, all key elements of logistics-based market differentiation.

In concurrence with strengthening global competition and the changing structure of global markets which impact multinational firms' operations (Altomonte and Pennings, 2009), some contingencies have arisen that can inhibit logistics-based differentiation. The globalization of supply and demand markets is problematic for firms' logistics operations, for many reasons (de Koster and Balk, 2008). For instance, previous research reveals that a large number of companies underestimate true logistics costs associated with global sourcing and order fulfillment because increasing global product flow drives higher finished goods inventory and associated increases in carrying costs for manufacturers (Han et al., 2008). Additionally, increased physical distance between buyers and suppliers leads to higher transportation costs; opportunities for disruption in logistics flows increase as supply chains lengthen in both geography and scope

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(Craighead et al., 2007); and, infrastructural deficiencies, cultural protectionism, and complex customs processes in foreign locales may hinder firms' ability to consummate global trade relationships. In short, globalization of commerce has significantly neutralized traditional product and price-based competition, while introducing new complexities that challenge many firms seeking to differentiate from the competition based on logistics (Zhao et al., 2007).

Many firms are countering these logistical complexities by enhancing knowledge-based assets in the supply chain (Autry and Griffis, 2008; Birou et al., 2011; Delen et al., 2007; Fugate et al., 2009). Given the lack of conclusive research on the relationship between knowledge management and firm performance (Fugate et al., 2009), in this paper we examine the role that logistics-related knowledge management processes play in facilitating market differentiation in global settings. Herein, we define *logistics knowledge management (LKM)* as a process of integrated, rapid development and exploitation of knowledge of the business environment by logistics operations personnel. We extend and improve upon recent research which suggests that the ability of a global firm to compete based on logistical capabilities can be predicted by its ability to manage knowledge development processes, i.e., the broader findings of Fugate et al. (2009). These researchers propose a model that describes a linkage between LKM and overall logistical performance, and we adapt their model as the underpinning for our current discussion. However, Fugate et al. (2009) study is deficient with respect to two facets important to global supply chain managers. First, Fugate et al.'s expansive operationalization of logistics performance cloaks the relative effect of LKM on logistics-based differentiation; we are unable to ascertain to what extent sound LKM processes link to a firm's ability to differentiate based on logistics operations, because in their model, differentiation is but one hidden factor in a multi-dimensional performance scale. Given the current focus on logistics-based differentiation by global manufacturing firms, this omission seems highly problematic—global supply chain managers should want to know how best to manage logistics-related knowledge in order to gain added market advantages (Cao et al., 2010).

Second, and perhaps more importantly, the Fugate et al. (2009) study opted not to account for the globalized supply chain management environment of recent years. Many modern firms are employing low-cost offshore manufacturing locations in order to defray labor costs (Byoungcho, 2004; Galbreth and Blackburn, 2010; Gray et al., 2009b) as well as other costs of raw materials and production (Han et al., 2008). Unfortunately, the Fugate et al. (2009) model fails to account for a firm's global manufacturing reach (GMR) – the extent of its presence in worldwide manufacturing – when determining whether LKM processes effectively lead to global logistics differentiation (Braziotis and Tannock, 2011). To illustrate this point, as Dell “commoditized” personal computers and changed the nature of competition in the PC industry, the company expanded its manufacturing operations to achieve increased local presence on a global scale. The benefits were dual: perceptual gains in consumer confidence due to the appearance of localized presence, and increased control over operational aspects in multiple world regions resulting from expanded logistics networks. Though the company still relies on creating a reliable product at a reasonable price with consistent service, these have become necessary but insufficient conditions for success versus rivals in the global marketplace—Dell's global logistics capabilities define its ability to create differential advantage. We postulate here that as firms develop a local manufacturing presence across increasing numbers of world markets, we should expect that the influence of LKM processes will be heightened (Rollins et al., 2011), such that firms are enabled to

provide customers with differentiated logistics service due to localization of business processes, yet this proposition has never been empirically evaluated.

We remediate these omissions in the literature by considering the combined effect of LKM (as per Fugate et al., 2009) and GMR, on both logistics differentiation and organizational performance. Our summarized findings are compelling for both supply chain managers and academics alike—GMR is found to enhance the predicted positive relationships between LKM and both logistics differentiation and overall organizational performance. As firms develop a more globalized manufacturing presence (da Silveira and Sousa, 2010), they are better able to execute the logistics processes that win customers versus rivals, and enjoy associated financial advantages as well. Accordingly, we contribute to the knowledge management and logistics operations literatures in numerous ways. First, we find further support for the Fugate et al. (2009) linkage between LKM and logistics performance, but in a more constrained scenario wherein logistics-based market differentiation is the specific goal (versus their focus on overall logistics performance). Second, we apply institutional theory to uncover the moderating influence of GMR on the linkage between LKM and logistics-based differentiation. Third, we detect an influence of the same moderating effect when assessing the relationship between LKM and organizational performance—an additional finding that is quite interesting in that there is no observed direct linkage between GMR and organizational outcomes, and the Fugate et al. (2009) study detected no direct linkage between LKM and performance. Thus, we posit and uncover a unique situation whereby both conditions are necessary but neither alone is sufficient for organizational performance advantage. The following sections review the existing literature, describe the method, and explicate our findings related to the current research process.

2. Background literature

2.1. Theoretical foundations

We ground our support for this research in theorization related to the knowledge-based view of the firm (Grant, 1996). The KBV is a relatively recent derivative of the traditionally studied resource-based view (i.e., Peteraf, 1993) which speaks to the plausibility that knowledge stocks, when unique and deployed strategically, can yield differential performance implications. While neo-classical economic theory suggests that tangible resources such as labor, land, and capital are the primary source of competitive advantage (Barney, 1996), more recent literature expands this view to include *intangible* resources, such as culture, management skills, brand names, trade contacts, efficient procedures, and of importance to this study, knowledge. Under the KBV, knowledge is the set of justified beliefs that improve an entity's capacity for effective action (Alavi and Leidner, 2001) and has been proposed to be an organization's most valuable resource (Grant, 1996). It should lead to capability-based market differentials between firms to the extent that it is used efficiently and is difficult for rivals to co-opt or replicate. Stemming from KBV (Grant, 1996), we apply organizational *information processing theory* (Daft and Weick, 1984) to theoretically hypothesize that LKM involves the sequential knowledge behaviors of generating, disseminating, reaching a shared interpretation of, and responding to logistics-related knowledge (Hult et al., 2004). Accordingly, we predict a positive association between LKM (i.e., the series of mediated relationships culminating in logistics-oriented knowledge responsiveness) and logistics-based market differentiation.

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