The impact of logistical integration, information technology, and long-term partnerships on supply chain performance

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A B S T R A C T
Practitioners and scholars alike agree that supply chain integration is a key factor in supply chain success. In these types of connections, material and information flows are crucial. Separate studies have dealt with the integration of information and material (logistics). The impact of supply chain partners' integration of information and material flows on operational performance is examined in this article. We focus on the function of long-term supplier relationships as the integration engine. We find that logistics integration significantly affects operations performance using data from 232 Australian firms. Significant impacts on logistics integration are caused by both the capabilities of information technology and the exchange of information. In addition, there are direct and indirect impacts of long-term supplier relationships on performance. The indirect effect occurs via the effects on information integration and logistical integration.

Keywords:
Supply chain integration Logistics integration Information integration Performance

Introduction

According to most theories on supply chain integration, there are two flows in the chain: one carrying items and another carrying information (Power, 2005; Pagell, 2004; Fisher, 1997; Huang et al., 2002). Integration of the supply chain cannot be limited to just one component; it must include both material and information components. According to Stock et al. (2000), when a company is more integrated, there is more communication about logistics, the logistics of the company are better coordinated with those of its suppliers and customers, and the organizational differences between the company's logistics and its suppliers' and customers' are more blurred. Integrative efforts among partners to improve the overall efficiency of the supply chain are often described as coordination, collaboration, or cooperation (Holweg et al., 2005; Matopoulos et al., 2007; Singh and Power, 2009). One example of this is collaborative planning, forecasting, and replenishment (CPFR), which is defined by Danese (2006).According to Stock et al. (2000), logistics integration is the process of coordinating the flow of commodities from suppliers to consumers across the value chain. This is achieved via specific logistical techniques and operational activities. By ensuring that the correct amount of items are delivered to the correct location at the correct time, logistics offers industrial firms space and time utilities (La Londe, 1983; Caputo and Mininno, 1998). Theoretically, logistic integration is based on previous work that establishes the smooth integration of logistical functions across the many supply chain participants (Stock et al., 1998, 2000; Childerhouse and Towill, 2003).

1. Foundational theory and working assumptions

First, we will define logistics integration and discuss how it affects competitive performance. Next, we'll go over how information technology (IT) and data exchange play a part in the supply chain's information integration, which in turn helps with material flow integration. Thirdly, we talk about how supply chain information management may directly

affect performance by focusing on the long-term relationship with suppliers. As a further step, we formulate our study hypotheses that relate performance to integration of logistics, information, and long-term relationships with suppliers.

1.1. *Logistics integration*

In order to stay ahead of the competition, businesses are putting more effort into integrating their suppliers and customers into the value chain processes, in addition to improving internal operations like process control and inventory management. Everyone knows that suppliers play a key role in providing customers with value and, in turn, in developing competitive capacities in four key areas: cost, flexibility, delivery, and quality. For logistics integration to work, the flow of supplies from suppliers must be well-coordinated so that manufacturing runs smoothly for businesses (Frohlich and Westbrook, 2001). According to Stock et al. (1998) and 2000, the line between the responsibilities of firms and suppliers is becoming more blurry as a result of this kind of collaboration. Strong logistical integration, according to several arguments (Lee et al., 1997; Geary et al., 2006), may alleviate a number of issues, including the bullwhip effect. Companies may use lean manufacturing systems with integrated logistics, which include reducing inventory and ensuring dependable order cycles (Cagliano et al., 2006; Schonberger, 2007). The general consensus is that supply chain performance may be enhanced when enterprises and their logistics partners work together as one (Tan et al., 1998). Basically, firms may achieve the same goals as vertical integration—improving quality, reliability, planning and control, and reducing costs—through logistical integration, rather than actually having it (La Londe and Masters, 1994). There are several operational benefits that can be achieved through improved logistics integration among supply chain partners. These include a decrease in costs, lead time, and risks (Nooteboom, 1992; Liu et al., 2005; Lemons et al., 1993). Additionally, there are improvements in sales, distribution, customer services, and service levels (Seidmann and Sundararajan, 1997; Kim, 2009; and customer satisfaction (Kim, 2009).
According to most empirical studies on the topic of supply chain integration, those that do so see an improvement in performance (Van der Vaart and van Donk, 2008). Studies have shown that stronger relationships between supply chain integration and performance have been found by Frohlich and Westbrook (2001), Sheu et al. (2006), and Li et al. (2009). Additionally, De Toni and Nassimbeni (1999) discovered that plants with better performance have more logistical interactions. Lastly, Sheu et al. (2006) found that supply chain operational efficiency is improved with higher levels of collaboration. So, we may start by making certain assumptions:
The first hypothesis is that operational performance improves when logistics are more integrated.

Section 1.2: Integrating supply chain information

According to Frohlich and Westbrook (2001), data flow from downstream to upstream in a supply chain is necessary to back up material flow from upstream to downstream. In their analysis of five supplier-retailer dyads, Sheu et al. (2006) discovered that enhanced information technology capabilities and greater communication provide an ideal environment for collaboration, engagement, and problem-solving. Therefore, material flow integration may be seen as predicated on information technology and information exchange.
Technical considerations (information technology connection) and social considerations (information sharing and trust) were identified as the two most important components of supply chain information integration based on our literature analysis. A number of studies have highlighted the significance of e-business technologies for information integration; they include Narasimhan and Kim, 2001; Frohlich, 2002; Gunasekaran and Ngai, 2004; Devaraj et al., 2007; and Sanders, 2007. Research by Yu et al., 2001; Narasimhan and Nair, 2005; Carr and Kaynak, 2007; Zhou and Benton, 2007; Li and Zhang, 2008; Sezen, 2008) and others has pointed out the significance of suppliers and firms communicating and exchanging information. This paper's central argument is that both components of data integration are critical. Companies will not be able to integrate their logistics if they put too much faith in technology without being prepared to exchange crucial supply chain data. According to Chae et al. (2005), Fiala (2005), and Fawcett et al. (2007), in order for companies to reap the full benefits of logistical integration, they must be able to construct both the technological and

social components of information integration. What follows is an examination of the two facets of data integration.

1.1.1. *Information technology*

1.1.2. When it comes to supply chain management, information and communication technologies are crucial in the manners listed below. To begin, with the help of IT, businesses are able to interact with their trade partners more complicated and massive amounts of information. As a second point, businesses may better manage and control their supply chain operations with the use of IT, which enables them to give real-time supply chain information such as inventory level, delivery status, and production planning and scheduling. Thirdly, IT helps companies and suppliers coordinate their forecasts and operational scheduling, which improves collaboration across businesses. Consequently, the challenges associated with coordinating operations within the supply chain, which are often impeded by factors such as time and distance, may be mitigated (Paulraj and Chen, 2007). Web internet, B2B private (Ethernet), and EPOS (Electronic Point of Sale) are just a few of the newly released technologies that have garnered a lot of interest for their potential applications in supply chain management and information technology. The integration of material flows amongst supply chain participants is enhanced by good IT connectivity, according to studies (Soliman and Youssef, 2001). According to Kehoe and Boughton (2001) and Swaminathan and Tayur (2003), IT plays a crucial role in supply chain operations such as sourcing, procurement, and order fulfillment. Therefore, our working hypothesis is:

H2. There is a favorable correlation between logistical integration and the degree of th information technology link between firms and their suppliers.

Information sharing

1.2. Sharing information often, in sufficient amount, and of high quality is what counts most, not the technical aspects of information integration. If there isn't a readiness to exchange necessary information, big expenditures in IT could not pay off (Fawcett et al., 2007). In order for businesses to effectively share information, they must do more than just transmit transactional data, like material or product orders, but also communicate strategic supply chain information. According to Li et al. (2006), supply chain partners may use strategic supply chain information to make informed decisions about their operations. Using POS data, for instance, providers may more accurately predict consumer demand, which in turn boosts service quality and efficiency for end users. In a similar vein, suppliers may better plan for replenishment and delivery using real-time inventory position (Seidmann and Sundararajan, 1997), which in turn improves service levels and reduces inventory costs. Intense and regular communication between suppliers and firms is necessary for this degree of information exchange. Partners in the supply chain engage in highly cooperative behavior as a result of the high communication intensity, which in turn results in highly symmetrical strategic information flows (Klein et al., 2007). The logistics benefits of information sharing with supply chain partners have been shown in numerous studies. These studies include ones on inventory management (Cachon and Fisher, 2000; Lee et al., 2000; Yu et al., 2001; Zhao et al., 2002), agility and flexibility (Swafford et al., 2008), and the bullwhip effect (Dejonckheere et al., 2004). For instance, according to Disney and Towill (2003), the bullwhip effect may be mitigated by the integration of Vendor-Managed Inventory (VMI) with suppliers. Therefore, we postulate: H3. There is a positive correlation between logistical integration and the degree of information exchange between firms

and their suppliers.

1.3. *Long term relationships*

There has been a sea shift in the way businesses interact with their suppliers. Strategic suppliers are becoming increasingly important to manufacturing companies as they concentrate on what they do well (Prahalad and Hamel, 1990). Here we focus on three important parts of supplier relationships that have changed. To begin, rather of relying on one-off contracts, companies are increasingly looking to establish lasting partnerships with their suppliers (Helper, 1991; Ogden, 2006). Second, related to the first point, companies no longer maintain a huge supplier base that allows them to switch vendors for almost every contract; instead, they utilize fewer suppliers for longer periods of time. As a consequence of frequent and substantial purchases spread out across time, the advantages of cheap prices brought about by supplier rivalry have transformed into low total cost of ownership (Helper, 1991). Finally, suppliers are now seen as an essential component of the company's operations, thanks to the elevated interaction with them (Choi and Hartley, 1996; Kotabe et al., 2003; Chen and Paulraj, 2004). Sharing of profits and risks, as well as early supplier involvement in product creation, are just a few of the new ways that cooperation has blossomed as a result of this shift. Extended lifespan is one facet of a successful supplier relationship. A firm may be prepared to spend heavily in the partnership's development, including information technology and data exchange, if the connection is long-term (De Toni and Nassimbeni, 1999). Strategic information flows and IT customisation are both positively correlated with levels of reciprocal trust, according to research by Klein et al. (2007). Information technology (IT) skills and data exchange are aspects of supply chain architecture that are impacted by a focus on the long term (Sheu et al., 2006). Information sharing is significantly related to long-term relationships with suppliers, according to Paulraj et al. (2008). This allows us to postulate the following two linked theories:

A good association between a company's long-term relationships with its suppliers and its use of information technology is associated with hypothesis 4.

H5. Long term relationship with suppliers has a positive relation- ship with information sharing between firms and their suppliers.

H6

As a possible precursor to buyer performance, Chen and Paulraj (2004) modeled a long-term relationship. De Toni and Nassimbeni (1999) discovered that plants with greater performance make better use of long-term supply agreements with suppliers, while Vickery et al. (2003) concluded that firms may increase their performance via long-term collaborations. In a similar vein, Singh and Power (2009) discovered that firms' competitive performance is directly impacted by successful supplier cooperation. Finally, we have our working hypothesis:

H6. The long term relationship with suppliers has a positive relationship with performance.

2. Research framework

Figure 1 depicts the study model. The model is constructed from six assumptions that connect performance, logistical integration, long-term partnerships, and information integration. In sum, the model encapsulates the three main features of an integrated supply chain proposed by Handfield and Nichols (1999): interactions between supply chain partners over the long term, flows of information and products, and flows of materials.

On several points, our model differs from that of earlier research. Five sets of Taiwanese vendors and wholesalers were the subjects of research by Sheu et al. (2006). A conceptual connection model was derived from their primary findings. The model encompasses supplier-retailer collaboration, performance, long-term relationships, and supply chain architecture (including features like information exchange and IT capabilities). Their theoretical model is therefore comparable to our research model in many respects. Our two main points of differentiation are the fact that we see information technology and sharing of data as separate concepts (whereas they see them as interdependent components of supply chain architecture) and that we acknowledge the direct impact of long-term relationships with suppliers on performance. We disagree with Fawcett et al. (2007) and contend that information exchange and IT connectivity are prerequisites for logistics integration rather than factors directly influencing operational effectiveness. In the quest for greater heights

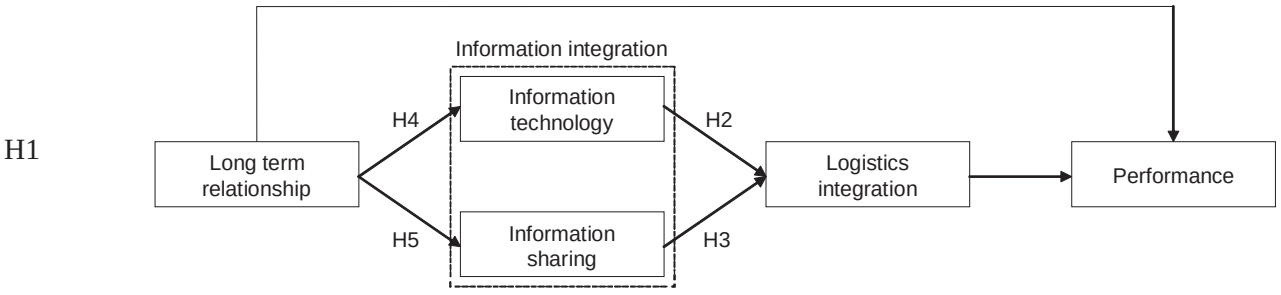


Fig. 1. Research framework.

when it comes to performance, the integration of physical elements must take precedence over the informational dimension. To rephrase, improving performance calls for a unified system for the transfer of data and physical goods. Li et al. (2009) examined the connection between IT installation, supply chain integration, and supply chain performance using data collected from 182 Chinese enterprises. To make their model more comprehensive, our research adds the social components of information integration (i.e., information sharing) and incorporates strategic connections with suppliers as possible antecedents of IT deployment.

To review, our research paradigm adds to the body of knowledge in three distinct ways. The first thing it does is check the supply chain's connection between data and material flows. Secondly, it evaluates the social and technical components of information integration. Third, it gives a thorough framework on the driver (long-term relationship) and enabler (information integration) of logistics integration and its influence on performance, integrating prior research on the issue and adding to it.

3. Methods

3.1. *Sample and procedures*

Managers at Australian manufacturing enterprises were surveyed by mail from late 2008 to early 2009 to provide the data used in this research. We bought the list of responses from a mailing list company and picked them at random. The response rate was 13.1% out of 1800 questionnaires sent out, with 232 valid replies received. In order to ensure that the data was free of bias, we compared the answers of early and late responders according to industry and company size. There was no statistically significant difference between the two sets of responders, according to the chi-square tests conducted on both categories.

Aside from this work, two additional studies have also used the dataset: Olhager and Prajogo (2012) and Prajogo et al. (2011). Concerning the function of supply chain management strategies in improving company performance, Olhager and Prajogo (2012) compare and contrast two production systems (Make-To-Stock vs. Make-To-Order). Various components of operational performance are studied by Prajogo et al. (2011) in relation to the distinct impacts of various supplier management strategies. Logistics integration is a central component in all of the papers, but they examine it through various lenses and with distinct factors that are pertinent to their respective research purposes. According to the breakdown of respondents by industry, 16% worked in electronics and electrical, 25% in machinery, 8% in the automotive, 11% in chemicals, 4% in food processing, 7% in construction, and 12% in other manufacturing. For the remaining "others" categories, we have medical devices, wood, printing and paper, and military manufacturing. The following breakdown of responses by organizational size (as measured in terms of the number of employees): 46% from companies with fewer than 100 workers, 35% from companies with 100 to 500 employees, and 19% from big manufacturing companies with 500 or more employees. As an additional service, we classified the sampled firms according to Hayes and Wheelwright's (1979) process types. About a third of the companies utilized assembly lines, while

about a quarter used batch processes, 3% used cellular, 20% used work shops, and the other 18% used project management software.
Respondents' positions varied, with 45% working as operations managers, 27% in supply chain/logistics, 18% in procurement/purchasing, and 3% in customer services.

3.2. *Measures*

To guarantee their content validity, most items used to construct the scales in this research were modified from the study conducted by Chen and Paulraj (2004). In order to gather replies, a 7-point Likert scale was used. Logistics integration, information technology, long-term relationships, and the scale from 1 (strongly disagree) to 7 (strongly agree). With the exception of "information sharing," which Chen and Paulraj (2004) initially referred to as "communication," we kept the names of the original constructs. We removed one item from the original Logistics Integration scale—"Information and materials flow smoothly between our suppliers and us"—because our framework differentiates between the two concepts and analyzes their interrelationships, while this item encompasses both. Quality, delivery, flexibility, and cost are the four essential competitive aspects that make up the operational performance metric. In this respect, we asked respondents to rank their own performance on a scale from 1 (very poor) to 7 (very strong), with 7 being the best and 1 being the worst in the business. See Table 1 for a list of all the materials used in this research.

4. Data analysis

4.1. *Scale validity and reliability*

All of the study's variables' measurements were validated at the same time using confirmatory factor analysis. As shown in Table 1, the findings of the confirmatory factor analysis and Cronbach's alpha are provided. Each piece has a hefty impact on its own specific structure. According to a number of studies (Carmines and McIver, 1981; Bollen, 1989; Bagozzi et al., 1991; Hoskisson et al., 1993), the measures seem to have satisfactory convergent validity and item loadings indicate that. According to Nunnally (1978), the five constructs have sufficient reliability according to Cronbach's alphas.

Table 1
Scale validity and reliability.

Scales	Items	Loading Paths	Cronbach's alpha
Long term relationship	We expect our relationship with key suppliers to last a long time	0.71	0.88
	We collaborate with key suppliers to improve their quality in the long run	0.79	
	The suppliers see our relationship as a long-term alliance	0.87	
	We view our suppliers as an extension of our company	0.86	
Information technology	There are direct computer-to-computer links with key suppliers	0.76	0.87
	Inter-organizational coordination is achieved using electronic links	0.91	
	We use information technology-enabled transaction processing	0.85	
	We have electronic mailing capabilities with our key suppliers	0.50	
	We use electronic transfer of purchase orders, invoices, and/or funds	0.55	
	We use advanced information systems to track and/or expedite shipments	0.62	
nformation sharing	We share sensitive information (financial, production, design, research, and/or	0.64	0.84

(communicatio	competition)	0.75	
n)	Suppliers are provided with any information that might help them		
	Exchange of information takes place frequently, informally, and/or timely	0.84	
	We keep each other informed about events or changes that may affect the other party	0.77	
	We have frequent face-to-face planning/communication with our suppliers	0.60	
Logistics integration	Inter-organizational logistic activities are closely coordinated.	0.76	0.93
	Our logistics activities are well integrated with suppliers' logistics activities	0.89	
	We have a seamless integration of logistics activities with our key suppliers	0.89	
	Our logistics integration is characterized by excellent distribution, transportation, and/or warehousing facilities	0.85	
		0.77	
	The inbound and outbound distribution of goods with our suppliers is well integrated		
Performance	Performance of our final products	0.48	0.64
	Speed of deliveries	0.52	
	Volume or capacity flexibility	0.62	
	Degree of product variety	0.54	
	Production costs	0.47	

w^2 ¼ 397.26, df¼ 260, RMSEA¼ 0.048, NFI¼ 0.936, NNFI¼ 0.970, CFI¼ 0.974.

The slightly lower than standard acceptable value of Cron- bach's alpha for performance (o0.7) is interpreted such that performance is indeed composed of multiple dimensions or elements. Such disparate measures as quality, delivery, flexibility, and cost performance contributed to this construct, and this could suggest that some firms (often) specialize or focus to excel in only a subset of these performance dimensions.

4.2. *Common method variance and discriminant validity*

To look for shared method variance, we used Harman's one-factor test (Podsakoff and Organ, 1986). Using principal component analysis, we loaded all 26 items onto a single factor and ran the test. If factor analysis were to reveal just one component, this test would indicate the existence of common method bias. Half of the items had factor loadings that were much lower than 0.5, and the factor analysis showed that less than 25% of the variance was recovered. These findings indicate that the data set did not have a major issue with common method variance.

We also ran discriminant validity analysis to see whether there was any overlap between the dependent and explanatory variables. According to Venkatraman (1989), each pair of components in this research underwent Confirmatory Factor Analysis (CFA) to verify discriminant validity. There were two rounds of CFA for every set of two. With the first CFA, we were free to estimate the correlation between the two variables. This model's chi-square value was estimated. The second CFA evaluated the model's chi-square value after fixing the correlation between the two constructs to 1.0. The constructs can be considered discriminantly valid if the difference between the chi-squares from the first and second CFA (Dw2) is larger than the chi-square value at the degree of freedom of 1 and significance level of po0.01 (i.e. 6.64), according to Hire et al. (1996). Ten chi-square tests were performed using the five components included in this research. There is

more evidence that there is no common method variance, and the values of Dw2 for all tests confirm that the constructs are discriminantly valid.

4.3. *Structural model*

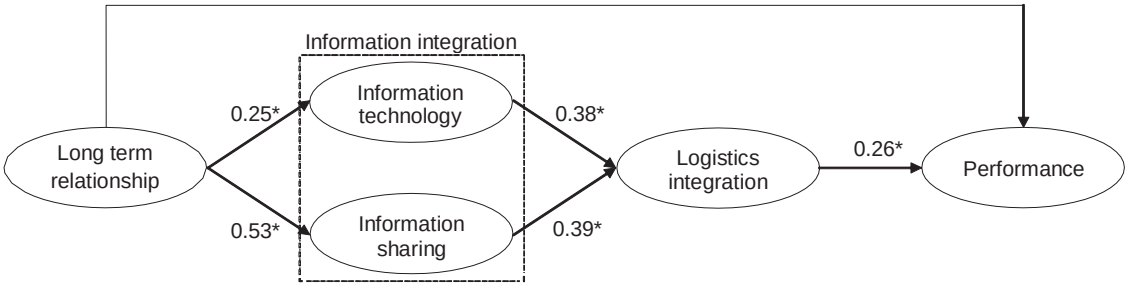
The structural equation model (SEM) findings are shown in Figure 2. For a model to be considered well fitted to the data, the ratio of degrees of freedom (309) to w2 (497.14) should be at least 3.0 (Carmines and McIver, 1981; Bollen, 1989; Hair et al., 1998). The fit indices (NFI½ 0.923; NNFI½ 0.963; CFI½ 0.967) and the Root Mean Square Error of Approximation (RMSEA½ 0.051 with a 90% confidence interval 0.043-0.060) are considered adequate, as per the recommendations (Mulaik et al., 1989). The operational performance was not significantly affected by the control variables of organizational size (in terms of the number of personnel) and process type (ranging from assembly line to project), with p-values of 0.00 and 0.08, respectively, and a significance level of 0.05.

What follows is an overview of the outcomes of the six assumptions.

The association between performance and logistics integration is favorable (H1:). With a significant parameter estimate of 0.26, this hypothesis is confirmed.

Secondly, there is a favorable correlation between logistical integration and the strength of the IT connections between companies and their suppliers. With a significant parameter estimate of 0.38, this hypothesis is confirmed.

Ho3: There is a favorable correlation between logistical integration and the level of communication between firms and their suppliers.



*
The path is significant at the 0.01 level.

χ^2 = 497.14 df = 309 RMSEA = 0.052 NFI = 0.923 NNFI = 0.963 CFI = 0.967

Fig. 2. Results of path analysis.

The statistical significance of the parameter estimate (0.39) lends credence to this theory.

The fourth hypothesis is that firms and their suppliers benefit from an IT link when the relationship between the two parties lasts for a long time. With a significant parameter estimate of 0.25, this hypothesis is confirmed.

Having open lines of communication between companies and their suppliers is associated with better long-term relationships (H5). The statistical significance of the parameter estimate (0.53) lends credence to this theory.

H6: A favorable correlation exists between performance and long-term relationships with suppliers. With a significant parameter estimate of 0.26, this hypothesis is confirmed.

5. Discussion of the findings and their implications

6. By looking at the connections between competitive performance, logistical integration, information integration, and long-term partnerships, this study adds to the literature on logistics integration. In sum, this study's findings add credence to the idea that strong external logistics integration is the product of sustained collaboration and the sharing of relevant data. As a whole, this research adds to the field of supply chain studies in the ways that are detailed below.

7. One important takeaway is that it proves information integration is necessary for material flow integration. Thus, the demand chain, which consists of information flows from consumers, will neatly direct the supply chain, which consists of material flows from providers.

This confirms what other research has shown: that connecting data and information at the supply chain interface is crucial to creating a smooth supply chain. When all parties involved in the supply chain have access to the same data, they can act as one, better meeting the needs of consumers and the market. Modern businesses face both possibilities and threats stemming from the significance of material and information integration. Companies face larger risks due to the increased supply chain unpredictability caused by rising rates of competition, customer demands, and market dynamics. Furthermore, operational operations have become increasingly scattered as companies concentrate on their core competencies and outsource non-essential tasks to suppliers located in different parts of the world. A robust integration mechanism between the supply chain members' business entities, supported by accurate and timely information, is necessary to address this tendency.

8. The second takeaway from this research is the need of keeping an eye on the two parts of information integration that have been the subject of separate supply chain studies. Our research shows that the impact of information technology skills and sharing of data on logistical integration is comparable, indicating that both are equally important. It is clear that the technical and philosophical components of management are well-balanced in supply chain information management. This is a big deal since a lot of companies are interested in the hard elements, which are simple to get (given enough money) and which they are sure will produce the desired outcomes from their investments in hard technology. However, research on supply chain integration has shown that many companies still have challenges with the "soft" parts of information integration, such as establishing trust and excellent communication for exchanging information (Arshinder and Deshmukh, 2008).
9. Limitations and further research

A number of caveats to the present study and potential avenues for further investigation are highlighted. Included variables are the only ones that may be included in each investigation. Following the advice of Handfield and Nichols (1999), we included elements found in the literature on supply chain integration, including the following: recording product and material flows; identifying and analyzing information flows; and establishing and maintaining long-term partnerships between supply chain partners. Although this research found significant benefits on performance from supply chain partners' integration of information and material flows, other elements that were not included may also have a favorable influence. Since company size and industry did not play a significant role in our investigation, we made sure to account for them. Nevertheless, it could be beneficial for future studies to account for other potential impacts, such as those that exist between producers of consumer products and industrial goods, among other examples. When seen through the lens of the idea of supply chain integration, logistics and information integration initially represent two connected but directional kinds of integration. Logistics integration, which is a part of forward integration, focuses on the physical flows of goods from suppliers to producers. In contrast, backward integration focuses on the flow of data from suppliers to manufacturers and the synchronization of information technology.

Material flows forward in a supply chain pipeline whereas knowledge flows backward, as stated at the outset. This research is based on the premise that these two flows are antithetical. The flows of information and material, however, have grown to include both directions in modern times. The evolution of the idea of reverse logistics means that materials are now flowing in the other direction, with worn or broken items being sent back to their original location for potential recycling, remanufacturing, or disposal (Sarkis, 2003). The flow of information must continue to assist reverse logistics, because producers must provide clear product information to facilitate recycling operations upon the product's end of life (Ferguson and

Browne, 2001). A new model of supply chain integration may be required for future research into the two-way flows of data and materials.

10. Conclusions

According to the results, supply chain integration is crucial for material and information flow integration, which in turn has a major impact on performance. Also, there are a lot of "hard" and "soft" management issues to consider when integrating supply chains, which makes it a challenging process. These characteristics enable logistics integration operations that deal with the actual material flow between the two parties. The only way to handle such complicated difficulties is for supply chain partners to have a long-term relationship. The significance of establishing lasting partnerships with suppliers, which has been advocated for since the advent of the quality management age, is therefore emphasized once again by this research. All of the constructs that were considered in this research had an indirect but favorable effect on competitive performance. This points to the complexity of supply chain partner integration and the fact that many skills work together to boost performance.

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