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Power, Trust, Integration and Performance in Supply Chains: A Literature Survey

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A B S T R A C T

Integration in the supply chain has been conceptualized and researched from multiple perspectives. Several studies have identified different types of supply chain integration. In this study, we empirically examine the multi-dimensionality of supply integration and explore its relational antecedents. We also examined differences in trust and relationship commitment for companies with different types of integration. To this end, we analyzed articles and synthesized the large, fragmented body of work dispersed across many disciplines. The study was based on articles which reflected the intersection of supply chain integration, Trust, Power and performance measurement, and then focusing on the role of integration in supply chain performance. Findings reveal that Trust seems to be the single most discussed element in making supply chains function effectively and efficiently. Integration in the new supply era is still an open area of research. Our results indicate that there is a positive and significant correlation between SCI and firm performance and these links are mediated by inter organizational relationships including trust, and power. This study identifies the need for empirical cross-industry research to include the development of partnership, collaboration, agility and flexibility.

Introduction

Supply chain integration (SCI) has been a highly researched topic during the last 20 years. Companies are now seeking closer relationship with their suppliers and customers. The benefits of such integration can be seen as a cost saving, flexible and efficient supply chain. (Flynn, Huo, & Zhao, 2010). A firm is more responsive to adjust itself with the ever changing external environment. Nevertheless, this brings also challenges to the firm. With collaboration comes a greater dependency on

the partner firm which leads the company to be vulnerable on the actions of its partner firm. This dependency becomes a serious concern if one of the supplier or customer has more power and he is using this power to influence the decision of its partner. Although use of power such as reward power can improve the performance of supply chain and strengthen relationship in the long term, some other type like coercive power can create mistrust and deteriorate the relationship. There are a number of empirical studies which link supply chain integration with firm's performance. While in the supply chain management literature several researches have presented a strong positive correlation between supply chain integration and performance; (Flynn, Huo, & Zhao, 2010, Li Koçoğlu, İmamoğlu, İnce, & Keskin, 2011; Lai, Wong, & Cheng, 2008; Prajogo & Olhager, 2012) some researches have raised questions about the empirical studies done to support this hypothesis (Fabbe-Costes & Jahre, 2007; Ho, Au, & Newton,

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2002). Literature suggests that there is considerable diversity in the conceptualization and operationalization of supply chain integration. In a review of survey-based papers on supply chain integration, van der Vaart and van Donk, (2008) have proposed a framework with the three categories of items to understand the integration; supply chain practices (specific activities), supply chain pattern (modes of communication), and supply chain attitudes (relational aspects, trust). The framework also includes the role of power in supply chain integration and its effect on firm’s performance.

This paper is organized as follows. Section 2 describes the methodology employed in the analysis, including article selection and the method of assessment. Section 3 describes state of supply chain integration. Section 4, 5 and 6 presents main findings with regard to the Power, Trust, and Performance, used in assessing integration. Section 7 presents conclusions.

1. Review Methodology

The study is based on an extensive literature review in three steps with an increasing level of depth of the analysis, Step one was an extensive review in order to categorize the key aspects of supply chain integration in terms of scope, areas of

integration, and the level of the relationship. A search of the subject in major academic databases, such as *Business Source Premier, Emerald Full text, Science Direct, and Wiley Online Library* was conducted. These research articles are culled out from electronic searches of the academic databases. Various keywords, such as “supply chain integration”, “supply chain performance”, “supply chain integration and performance” and “integration impact on supply chain performance”, were queried in the above-mentioned databases to acquire a list of papers. Non-referred articles, such as editorial notes, prefaces, industrial reports, book reviews, and interviews, were excluded from the preliminary search process. In step two, we conducted additional literature reviews in order to identify how the topic has been empirically covered. To ensure that only relevant paper got included a rigorous process was performed to further filter the preliminary search results by thoroughly reading all articles and summarizing their focus area and contribution to the literature. In our third step, we reviewed the articles for an in-depth analysis.

The selected list of papers included in review and their classification with respect to their operationalization and level of analysis are given in Table 1.

Table-1: Operationalization and Level of Analysis Classification

S. No	Studies	SCI Dimensions	Operationalization/Definitions	Level of Analysis
1.	Narasimhan and Kim (2002)	Integration with customers	<i>Integration with customers:</i> Follow-up with customers for feedback, the level of computerization for customer ordering, the level of organic linkage with customers through information network, the level of sharing on market information, the agility of ordering process, the frequency of periodical contacts with customers, the level of communication with customers	Manufacturing corporations
		Integration with suppliers	<i>Integration with suppliers:</i> Information exchange with suppliers through information technology, the level of strategic partnership with suppliers, the participation level of suppliers in the design stage, the participation level of suppliers in the process of procurement and production, the establishment of quick ordering system, stable procurement through network	
2.	Vickery et al. (2003)	Integrative information technologies	Integrative information technologies: Integrated electronic data interchange, integrated information systems, computerised production systems	Firm level
		Supply chain integration	Supply chain integration: Supplier partnering, closer customer relationships, cross-functional teams	
		Information sharing	(SCI dimensions not explicitly articulated) Not applied Information sharing: Refers to exchange of information among company,	

			customers and suppliers Internal integration: Integration among internal functions	
3.	Zailani and Rajagopal (2005)	Internal integration External integration with suppliers	External integration with suppliers: Company working closely with suppliers, viewing this latter as an important component of the supply chain, how closely suppliers work with company to seal a deal and level of strategic partnership	Not applied
		External integration with customers	External integration with customers: Company working closely with customers, viewing this latter as an important component of the supply chain, and follow-up with customers for feedback	
4.	Kim (2006)	Company's integration with suppliers, Manufacturing corporations	Narasimhan and Kim's (2002) operationalization	Manufacturing corporations
5.	Swink, Narasimhan, and Wang (2007)	Strategic customer integration	Strategic customer integration: Close contacts with customers, results of customer satisfaction surveys shared with all employees, opportunities for employee-customer interaction, a formal customer-satisfaction programme	Manufacturing Plant Level
		Strategic supplier integration	Strategic supplier integration: Cost information sharing, joint cost/ quality improvement, real-time production schedule information with suppliers, early supplier involvement in product design, buyer-supplier councils	
		Coordination	Coordination: Purchasing of common materials coordinated at the corporate level, corporate ordering and stock management policies, aggregate planning for plants according to global distribution needs, managerial innovations transferred among plants technological innovations and know-how transferred between plants	
6.	McKone-Sweet and Lee (2009)	Supplier involvement	Supplier involvement: Sharing problems with suppliers, willingness to change assumptions in order to find more effective solutions with suppliers, positive attitude toward cooperating with suppliers, openness of communications in collaborating with suppliers	Plant level
		Customer involvement	Customer involvement: Close contact with customers, customers' feedback on quality and delivery performance, customer involvement in product design process, responsiveness	
7.	Flynn, Huo, and Zhao (2010)		Customer Integration: Narasimhan and Kim's (2002) items and, in addition, sharing of point of sales (POS) information, customers' demand forecast, manufacturer's available inventory and production plans	Manufacturing companies
			Supplier Integration: Narasimhan and Kim's (2002) items and, in addition, sharing of suppliers' production schedule, production	

			capacity and available inventory, and of manufacturer's production plan, demand forecast and inventory level, joint suppliers' process improvements.	
8.	L. R. Vijayasathy (2010)	Relational integration	Multi-dimensionality of Supply Chain Integration	Not applied
9.	Huo (2012)	Customer integration	Customer Integration: Flynn, Huo, and Zhao's (2010) operationalization	Manufacturing companies
		Supplier integration	Supplier Integration: Flynn, Huo, and Zhao's (2010) operationalization	
		Information integration	Information integration: Refers to the coordination of information transfer and collaborative communication in the supply chain	
10.	Leuschner, Rogers, and Charvet (2013)	Operational integration	Operational integration: Refers to the collaborative joint activities, and coordinated decisions making in the supply chain	Not applied
		Relational integration	Relational integration: Refers to the adoption of a strategic connection between firms in the supply chain	
11.	J. Han (2013)	Information integration	Effects of Supply Chain Integration on Firm Performance	Plant level

3. Supply Chain Integration: A Normative Perspective

As early as the 1970s, researchers have been articulating the need for integration in the physical distribution of products (e.g., Lambert, Robeson, & Stock, 1978). However, it was not until a decade ago that researchers started to call for a systematic approach to SCI. Over the past decade supply chain integration has been analyzed from different perspective and literature suggest that that there is considerable diversity in the conceptualization and operationalization of supply chain integration. As SCI is a multidimensional concept (Flynn et al., 2010), literature classifies SCI into two main types, such as internal integration (II) and external integration (EI) (Swink et al., 2007; Vijayasathy, 2010). Internal integration (or inter-functional and inter-departmental integrations) is about collaborating, coordinating and integrating the operational areas within the organisation so that the departments and functions within the organisation function as an interrelated process (Braunscheidel and Suresh, 2009; Yu et al., 2013). Some researchers have studied both up and down stream integration (Frohlich and westbrook 2001, Narasimhan & Kim, 2002) while others have focused on one directional integration either with suppliers or buyers (Giménez & Ventura, 2005). Apart from external integration some researchers have studied the internal integration and the technologies and tools which are used to enable integration. (Wang et al 2006).

3.1 Types of SCI

The classification of SCI varies across different studies, in which SCI was investigated from different perspectives. From a perspective of collaborative behaviors that happen within and across supply chain organizations, such as intra/inter-

organizational process management and inter-organizational collaboration, Morash and Clinton (1998) investigated and compared three types of SCI for about 2000 global companies. They argued that 1). Intra-organizational process integration integrates cross-functional flows, 2). Inter-organizational strategic alliances integrates behavioral, communicational, and interactive flows in supply chains, and 3). Inter-organizational operational excellence integrates physical, spatial, and temporal flows in supply chains. The decision-making process was also compared for these three types of SCI, from the strategic, tactical, and operational perspectives.

3.2 Internal integration

Research by Braunscheidel, Suresh and Boisnier (2010) provides empirical support for the integration-performance relationship. They have also explored the link between internal integration and external integration empirically. They found that a culture characterized by adhocracy, which encourages flexibility and innovation, benefited delivery performance, and that conversely, a culture characterized by inflexibility and control, was associated with lower performance.

Han (2013) investigated the impact of SCI on firm performance for pork processors in China. In his study internal integration and external integration was positively and significantly associated with firm performance. IT integration was not significant in its contribution to firm performance in the pork processing industry but he argues that in an uncertain market, responsive technologies can help firms to secure raw materials and supply customers in due time. Results of a study by Huo (2012) show that internal integration improves external integration and that internal and external integration directly

and indirectly enhance company's performance. In addition, he has also found full or partial mediating effects among SCI and company.

3.3 External Integration

Using the Coordination Theory, Lai, Wong, & Cheng (2008) explored the impact of electronic integration of intra-organizational and inter-organizational business processes on organizational performance in terms of logistics cost and service improvements. They also proposed that e-integration was a multi-dimensional construct comprising a system of electronic linkages to attain logistics cost reduction. Their findings were consistent with the development of e-integration with a unidimensional electronic linkage which provides a limited coordination mechanism within and between firms for logistics performance. In contrast to the other studies which support hypothesis that IT implementation increases the performance (Li, Yang, Sun, & Sohal, 2009) results suggest that IT implementation has no direct effect on supply chain performance, but instead that it enhances the communication process. A key finding of their study is that SCI is affected by IT implementation, and SCI mediates the relationship between IT implementation and supply chain performance. In a review of survey-based papers on supply chain integration, Van der Vaart and Van Donk, (2008) have proposed a framework with the three categories of items to understand the integration supply chain practices (specific activities), supply chain pattern (modes of communication), and supply chain attitudes (relational aspects, trust). We find this framework is more comprehensive and followed in our research. This paper analyses the perspective of the supplier of an automobile firm on supply chain integration in a dyadic relationship.

3.4 Relationship Integration

From a strategic perspective, strategic integration between supply chain firms commences when the inter-firm relationships are considered to be strategic assets (Anderson, Hikansson, & Johanson, 1994). Webster (1992) argued that marketers must place a high emphasis on the maintenance of ongoing customer-supplier relationships in order to facilitate the progressive involvement between two partnering firms. Bowersox et al. (1999) further declared the importance of an effective relationship management in the contemporary SCM and advocated the identification and use of "relationship integration". Unfortunately, the paper could not make a good distinction between "relationship integration" and "strategic integration".

Relationship integration refers to the degree to which a firm can structure the formation, commitment, maintenance, and exit of relationships across organizations into a consensus and contractual agreements in order to achieve competitiveness (Bowersox et al., 1999; Stank, Keller, & Daugherty, 2001).

4. Power Influence on Partners

Power can be defined as the ability of one channel member to influence the decisions of another channel member. (Brown

et al., 1995). Power is not a unidimensional construct, it has been classified into six types according to the power base (Brown et al., 1995). These are (1) expert power (the source has the knowledge, expertise, or skills desired by the target), (2) referent power (the target values identification with the source), (3) traditional legitimate power (the target believes the source retains natural rights to influence), (4) legal legitimate power (The target believes the source retains judiciary rights to influence), (5) reward power (the source retains the ability to mediate rewards to the target), and (6) coercion power (the source holds the ability to mediate punishment to the target).

Legal legitimate power, reward power, and coercion power are mediated powers because the reinforcement of these powers over the manufacturer is controlled by the supplier/customer. As the source of power, the supplier/customer decides whether, when, and how these types of power are used to influence the manufacturer's (target's) decision and behaviour. Frohlich & Westbrook, (2001) in their paper investigated supplier and customer integration strategies and they concluded that trust, commitment and mutual dependence to supply integration have a positive relationship while a negative association between dependence asymmetry and supply integration exists. In another study, (Benton & Maloni, 2005) examined the impact of different types of power on the strength of the relationship between the supplier of automobile parts and the automobile manufacturers, and how the strength of the relationship influences the performance of the supplier, the manufacturer, and the supply chain.

5. Trust between Partners

Trust in supply chain management has been defined as the willingness to rely on a Supply chain partner. It is viewed as the most critical relational factor which facilitates cooperative activities among SC partners. Trust can be developed by creating an atmosphere in which SC members willingly exceed the minimal requirements of a relationship to increase the likelihood of success for the SC (Ireland and Webb, 2007). Many researchers have argued that trust is a useful lubricant to deal with social dilemmas and a fundamental ingredient to maintain cooperation and to avoid conflicts (Yeung et al., 2009). Using the transaction cost theory, one can argue that trust among SC partners can reduce unnecessary tension, opportunism and it can help to increase specific asset (Wang et al., 2011). If a manufacturer trusts its suppliers, it has confidence in the partner based on the expectation of cooperation, hence, establishing trust has become a key method to uphold long-term cooperative relationships among SC partners.

6. Performance Measurement in SCI

Literature review confirms that there are many surveys which measure output performance of the focal firm on an aggregate level. There are many doubts on the value of such an approach. If only financial measures such as market share or ROI are used, they lack the holistic picture of performance assessment. If we assume that integration means investing in a buyer-supplier relationship, it would make sense to measure

performance in terms of the aims of these efforts with respect to this particular relationship. So apart from taking financial measures which is a more macroeconomic parameter it will be useful to use operational performance such as reduce reaction times and/or stocks, inventory turns, improved service, and shorter lead time. Measuring on the level of relationship directly as some papers do (e.g. Benton & Maloni, 2005; Johnston et al 2004; Giménez & Ventura, 2005), can also help in dealing with another measurement issue. Many research papers use subjective measurements of performance relative to competitors that are hard to validate. A last remark relates to the measurement of performance. We aim at measuring the performance in the buyer-supplier relationship such as lead time, customer service, and cost to serve.

7. Conclusion

This literature review paper aimed to reveal the past and current state of SCI research published in a number of key operations and SC management journals, thereby focusing on the past trends and current patterns in SCI practices in different sector organizations. Our review highlights the limited number of articles addressing integration of the extended supply chain. Second, current level of SCM integration, as presented in these articles, mainly covers internal or dyadic integration with significant emphasis on integration at the operational/transactional level. Third, although academics state that organizations should embrace integration since it can lead to enhancements in both efficiency and effectiveness, our findings show that there is a lack of empirical evidence to confirm these benefit. The main results from our literature review suggest that there is limited empirical research studying integration beyond the dyadic level and a lack of empirical evidence supporting the claimed benefits of SCM integration. Finally the limited number of articles addressing integration of the extended supply chain needs to be bridged by the scholars in taking up research.

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