

Integrated Supply Chain Management and Organization Capability

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Abstract: This paper described a research model for aligning organizational capabilities and an integrated supply chain capability (ISCM). Firstly, the research model derived the four levels of ISCM. Companies could gradually build up their capabilities by rationalizing the network of suppliers, sharing information and monitoring, efficiency optimization, and sharing risks and rewards. Secondly, organizations developed from a transaction-based to a relationship-based culture using a set of human resources practices, organization changes and collaborative culture. Finally, the research model derived supply chain orientations from the two dimensions: organizational and integrated ISCM capabilities. To realize the fullest benefits from ISCM, the model suggests that the companies should balance their organizational capability with the supply chain integration.

Keywords: Integrated Supply Chains Management, Organizational Capability, Culture and Structure

I. Introduction

Current research on supply chain management emerges mainly from the logistics and operations fields, as well as information systems, information technology, and marketing. Notable for its absence in this literature, however, is the field of human resource management, or the “people factor” or “soft factor” [1] in supply chains. Like supply chain management, human resource management is characterized as a potentially important yet underutilized source of competitive advantage for firms [31].

Pfeffer [23] notes the importance of the soft human knowledge and skills as an alternative organizational variable in enduring as competitive advantages. Given the increases, in both number and range, of supply chain efforts, the strength of human resource and organization strategies and their alignment with the supply chain configuration notably reduces the potential for lost opportunities and risks of underperformance [14].

Some studies (c.f. [27]) focus on impact of human resources (HR) activities on general research in just-in-time. This study considers cross-national cultural studies relating to products, processes, and systems. Specifically, [28] offers a relevant cross-national cultural perspective on differences in process implementation.

Shub et al. [27] adopted formal and informal transaction-based mechanisms and strategies, which must be filled by trust, commitment, and other human attributes [14], [1], [32]

as well as organization variables, such as structure, culture, and empowerment. The term “relationship-based strategies” is used here to include such facilitative aspects of human resource activities and organization variables. Thus, a firm may pursue formal transaction-based strategies, more informal relationship-based strategies, or some mix of these two pure alternatives. Most of other studies [18] focused on the extreme of this continuum rather than expediting combinations of these variables.

Roh et al. [25] link organizational culture and supply chain strategy using competing values and an uncertainty framework. This paper presents diverse requirements for effective design of supply chains in that for each pattern of organizational culture, a corresponding supply chain orientation is identified.

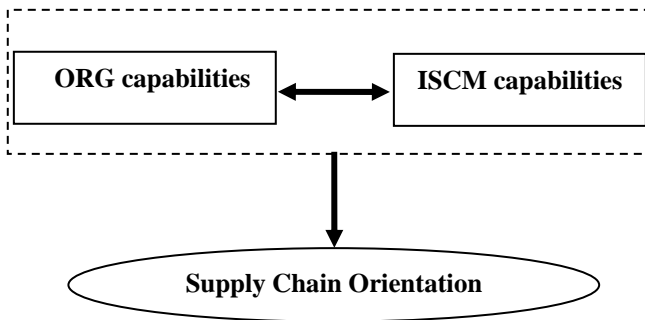
There is little in the literature that describes the relationship between human resource activities or organization variables and supply chain success. This shortage may perhaps be due to the previously noted initial research emphasis on technological and process changes (hard component) in supply chain topics. This study acknowledges previous literature in describing elements of “soft area” such as culture [25], [18], human resource management practice – HRM [27] and in developing behavioral guidelines within the boundaries of an individual firm [19].

However, these organizational initiatives (culture, structure and HRM) are all interrelated. A dynamic culture characterizes by a process focus or a cross-functional structure, in which team members are highly skilled workforce due to training and HR policies [26]. Companies among supply chain tend to develop a mixed set of these variables to facilitate the business process and the supply chains. On the other hand, research has not yet fully addressed the development of this organizational capability, especially how these capabilities emerge into integration of supply chain management. Therefore, this study develops a research model to examine organizational capabilities and integrated supply chain management (ISCM).

II. Research Model

The purpose of this paper is to develop a mapping model of organizational capability and different levels of supply chains integration. To address this issue, this study proposes to examine the ORG and ISCM capabilities together as in the Figure 1. The association between organizational and ISCM capabilities defines a supply chain orientation (SCO).

Figure 1 Supply Chain Orientation



The section below discusses literature and development of the ISCM and ORG capability.

III. Integrated Supply Chain Capability

This integrative aspect of the supply chain management has many labels in the literature, including integrated purchasing strategy, supplier integration and supply base management [9]; buyer-supplier partnerships, strategic supplier alliances, supply chain synchronization [2]; and integrated supply chain management [31].

However, most of these models are descriptive and the issue of supply chain integration has often been mentioned without clearly indicating how the process can be implemented gradually and what this integration really requires. De Meyer and Kim [10] initiated a conceptual model that examined nine ISCM levels using data from the 1996s Manufacturing Futures Surveys in North America and Europe. The nine ISCM initiatives included the following:

1. Distributor-base reduction: Stronger relationships with a limited number of high quality distributors could help firms respond quickly to market shifts and demands.
2. Supplier-base reduction: Stronger relationships with a limited number of high quality suppliers could help firms to respond quickly to market shifts and demands.
3. Communication at multiple levels indicates the extent of communication at different levels within supply chains. The level of communication could improve with increased power or trust.
4. Information sharing and monitoring Supply chain members exchange information to different levels of intensity, such as point of sales, inventory and production requirements.
5. Joint planning and problem solving focus on management of business relationships and networks. A focal firm should develop management capability to mobilize and coordinate resources and activities of the other members in the supply chain.
6. Extending time horizon of planning refers to the extent of cooperative efforts between supply chain members in exchanging information and implementing programs that are essential for effective production for example, Manufacturing Resource planning (MRPII).

7. Channel wide management of inventory examines various applications such as Just-in-Time (JIT) and Efficient Consumer Response (ECR), which could reduce inventory.
8. Total cost approach refers to the system of cost reduction in enhancing revenue when the firm fully leverages its sourcing and supplier/distributor management.
9. Sharing risks and rewards are management practices that are used to reallocate system wide benefits and to spread the associated risks. The supply chain members agree to certain formal or informal methods of benefit and risk sharing.

Conceptually, the different activities above were grouped together to demonstrate four levels of ISCM. These levels suggested that companies could gradually build up capabilities in each of these levels:

- Rationalizing the network,
- Sharing information and monitoring,
- Implementing systems, and
- Sharing risks and rewards.

De Meyer et al [10] asserted that firms should start with rationalization of the network between their suppliers/buyers; then use these partnerships to have closer information exchange and joint problem solving; followed by developing common systems and implementing joint efficiency programs; and finally sharing risks and rewards between partners. The results indicated that it was possible to distinguish the four levels of ISCM and that a sufficient performance had to be achieved in one level before moving on to the next level. This study continues to further this conceptual model with the development of ORG capabilities.

IV. Organizational Capability

Shub.et al [28] describes and characterizes the literature of the soft supply chain “support variables” as they relate to changes in supply chain management. The specific research question addresses the degree to which various human resource activities and organization variables contribute to supply chain success.

The development of process-focused organizations that span the entire supply chain has become increasingly important to competitive survival [27]. A process-focused team should acquire the following capabilities:

- Sharing of infrastructure competencies [11], with allied companies drawing on the intellectual and physical resources of channel partners [2] to undertake the assigned projects
- Sharing information across firms’ borders[12], facilitating transparent information flow among the interested parties in the process-focused teams
- Engaging top management support [20], committed to organizational changes, new technology implementation, and with collaborative attitude and skills to the SCM concept.

Competitive pressure has contributed to the growth of an innovative form of collaboration, the network equivalent of organizing a firm's supply chain [13]. The high interdependence among the selected supply chain members creates a connected set of assets across the network, which is difficult for competitors to replicate [11],[2]. However, managing these assets could be a critical task for management, while simultaneously managing cross-function and cross-boundary relationships [21]. The process-focused organization often requires management to share common goals and objectives [27], representing the highest level of relationship between the firm's management in a supply chain. [10] illustrated this process as sharing risks and rewards, since supply chain management often accompanies these procedures.

As managing supply chain network requires a portfolio of capabilities, managerial roles are becoming more complex and challenging [22]. The new manager must initiate the development and diffusion of innovative activities, rather than merely controlling and assigning operational activities; such initiatives are likely to lead to a climate of trust and collaboration in the supply chain.

The first and most important SCM strategic resource is the people who define the company's work culture and plan and execute the firm's business functions [27]. Spekman et al [29] noted the reluctance of supplier and buyers to share information, especially when it is sensitive. While technology can assist in sharing information, the basic cause of this reluctance to share information is cultural [24]. Increased information sharing requires, therefore, a more widespread cultural change, such as changes in basic behavior, values, attitudes and management expectation. Companies among supply chain tend to develop a set of HR practices, to redesign the organization structure and to create appropriate cultures to facilitate the business process and the supply chains. This study examines this organizational association and their relationship to ISCM

V. Supply Chain Orientation

Implementation of integrated supply chain management is not only the realization of a technology change but also a process of organizational change. Different implementation phases reflect increasing levels of complexity in terms of technical implementation, process changes and trading partner relationships [27].

The model in Figure 2 describes how organizational capability affects the process of integration of supply chain management. The logic behind that is how the focal company develops its capabilities for their ISCM and to which extent these capabilities being used, e.g. at operational or strategic levels.

The framework positions the stages of supply chain integration (left-hand side) according to the level of organizational capabilities (right-hand side). This is a four-stage path from the formulation of a network of business relationships through information-intensive processes and data sharing to joint operation and strategic objectives along with suggestions for empirical investigations. This

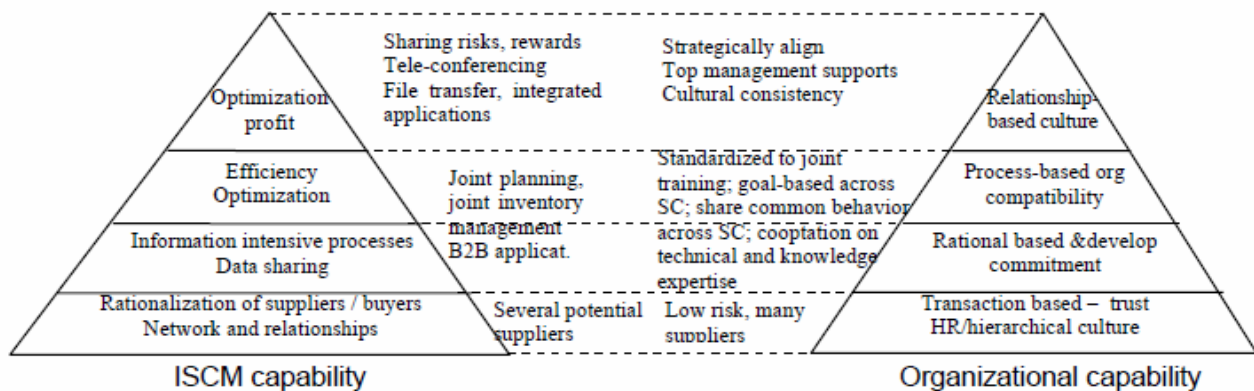
conceptual four-level hierarchy channel of integration is proposed not as a definite taxonomy of interdependence, but as a framework built around common obstacles that captures some of the transition difficulties from one level of interdependence to another.

Rationalization of network buyers/suppliers

In many cases, manufacturers have an abundance of suppliers and distributors, and they suffer from the complexity created by the multitude of contacts with these partners in the supply chain [31]. Companies tend to rely on a market structure that is characterized by a low level of product and asset specificity. Suppliers and distributors are typically driven by price, quality and term of delivery and characterized with low level of asset specificity [16]

Therefore, the first step in ISCM is the rationalization of the existing network of suppliers and distributors and then developing a network or a club. The company tends to have high formalization that governs by rules, policies, selection criteria etc. Developmental trust is needed at social based rather than process based [16] to leverage the cost of multiple contacts and maintain a network with a higher level of end-user interaction and support. The expectations are minimal investment across the supply chain and more standardized and compliance-based training. The fierce competition between supply chains versus supply chains requires sharing assets and infrastructure for management of supply chains. Buyers and sellers need to choose a coordinating mechanism in order to economize on transaction cost, which includes factors such as asset specificity, uniqueness, uncertainty and complexity of the exchange as well as opportunistic behavior. The 'mixed mode', or the 'middle theory' network structures, an intermediate forms of marketplace, are situation-dependent forms existing in many business relationships, blending hierarchical and market structures in a coordinated manner.

Figure 2. Mapping of ORG capabilities to ISCM
(Adapted from [9],[24], [6], [27])



Information-intensive processes

The second level of ISCM is where information sharing and a degree of collaboration depend upon the extent to which a company should be prepared to trust its trading partners with this depth of information [29]. The author suggest that more intensive information exchange creates both entry and exits barriers. As indicated earlier, the roles of information systems such as EDI/E-bus, as a key enabler for competitive advantages through cementing relationships with customers, enable integration forwards or backwards in the industry. Firms follow transactional-based approach often provide limited straining, staffing and routine jobs that require a lower skilled workforce lead to less motivation for employees to providing the service level expected in a true relationship based environment [16]. These firms often evolve into a more rational based and develop commitment for information exchange.

Operational coordination, costs optimization

Once partners share information and come to common solutions, they will move to more active forms of collaboration including common deployment and implementation [9]. This level indicates joint operations among supply chain members in order to reduce redundancies and leverage the cost of the whole supply chain. Models for ordering like Continuous Replenishment (CRP) and Efficient Consumer Response (ECR) not only offered much greater interdependence between firms in the industry, but also enabled dramatic improvements in channel efficiency[6]. EDI was also considered as a backbone for these e-business models.

The author argues that relationship within the supply chain or “club/network” could move to a higher level of collaboration aiming at the most important goal that is efficiency. Process focused team [26] helps supply chains sharing/acquiring new resources and assets, creating new challenges and prospecting for opportunities [5]. Dynamic structure (taskforces or teams) and joint training have

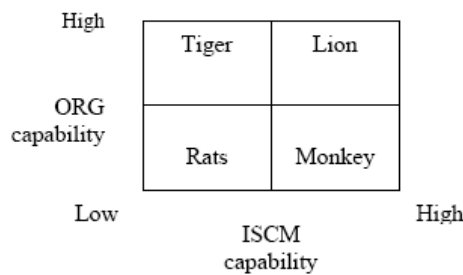
enabled members of supply chain exercise relationship-based cultural strategies, which support for open communication, high-level trust, interdependence and global costing/optimization. McAfee [16] discusses relationship-based strategy and a high degree of cultural consistency is needed. Relationship-based culture is characterized by mutual trust and interdependence on the part of both employees and supply chain members. The commitment from companies in the supply chain to maintain certain degree of cultural consistency is worth of investment in its employees and employees make a long-term investment in the firm logistics partners (c.f.[16]).

Strategic collaboration, profit optimization

The fourth level of the model is based on the theory of corporate coherence. Companies in the supply chain are now focused on profit optimization instead of only cost reductions. They tend to have “benefit relocation” [14] and share risks and rewards [9]. At this level, senior managers in both companies establish close relationships based on mutual trust, and become willing to disclose sensitive and proprietary information which, when used correctly, benefits the overall channel [6].

This conceptual model suggests that the degree of association between organizational capability and the levels of integration process could be different. A company could use a set of organizational capabilities to support their supply chains [6]. However, to realize full benefits from ISCM, the model suggests that the company should align its organizational capability with the supply chain integration. To address this question, the two dimensional model in Figure 3 proposes to examine the formulation of supply chain orientations from organizational capability and of the ISCM.

Figure 3 Supply chain Orientation – ISCM and ORG capabilities



The four quadrants in Figure 3 formulate four generic Supply Chain Orientations as follow:

1. Lion, presents companies with high ORG capabilities and ISCM capabilities. Lion are well-organized, good team players, and are good at networking.
2. Tiger, includes companies with high capabilities in ORG and less ISCM commitment. Tigers are strong, well discipline but act alone.
3. Monkey, presents companies with low level of ORG capabilities but possess high ISCM commitment. These companies tend to have more external ISCM capability than ORG items. Monkeys are not well organized
4. Rat, characterizes companies with low capabilities in both ORG and ISCM.

This model suggests that each level of ISCM process is best suited for a certain level of organizational capability. The benefits of the relationships between ORG and ISCM are expected to be balanced by both lower transaction cost and improved performance from closer relationships [24]. Companies already recognizing the importance of ISCM may need intensive process focus or cross-functional teams to exchange high intensity and confidential information.

VI. Conclusion

This study contributes to the SCM literature body in the field of organization structure, culture and human resource practices. The study describes a research model aligning organizational capabilities with their ISCM capabilities. The research model provides a company’s position within two dimensions: organizational and integrated SCM capabilities.

From the managerial perspective, the framework could help companies align their capabilities in both ORG and the process of ISCM. The framework suggests a “sustainable supply chain orientation”, which is obtained when there are linear relationships between ORG and ISCM capabilities. The companies, which have non-linear relationships, should develop appropriate programs whether to support ISCM process or to improve ORG capability.

VII. Limitation and future research

Further research opportunities could advance the research model in two logical directions. The first direction is to empirically test and develop of case studies would be useful

to illustrate supply chain orientations. The next direction would be studies of cross industries and groups. The nature of products, assets specificity, culture, HR context and other specific regulations would influence the decision-making processes, and thus could lead to different SCOs. Comparisons across industries would be useful to examine the validity of the ISCM and ORG constructs.

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