Interorganizational Interaction Processes for Demand-Supply Management in Business Networks - An Opportunity for a Dialogue between Industry and Academia

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Abstract: A variety of interorganizational interaction processes are essential to the effectiveness of business networks. This paper explores the nature of interorganizational interactions both from an academic perspective (the configurational approach) and an accepted industry process framework perspective (CPFR) and discusses shortcomings in both that could be addressed by joint efforts between academics and practitioners.

Keywords: Interorganizational interaction, Collaboration, Configurational approach

I. Introduction

Interorganizational networks are pervasive in business models across different industry sectors (e.g., [2],[10],[21], [24],[27]). Network structure and interaction processes are tightly intertwined [2]. As organizations increasingly depend on inter-firm relationships for achieving their strategic goals, effective management of B2B interaction processes and network structures becomes essential to strategy implementation.

Moreover, businesses are consistently adjusting in response to environmental change. While the globalization of supply and demand continues, responding to post-2001 regulatory changes and the recent volatility in the world economy has necessitated adaptation to strategy, structure and process implementations. But as Miles, et al. [28] suggested in the case of individual organizations, the complexity of adjustments in multi-firm networks may be penetrated by searching for patterns of behaviour and taking into account the interrelationships between strategy, structure and B2B interaction processes.

II. Interorganizational Interaction Processes

Till date there have a couple of frequently referenced definitions of interaction processes. The definition by Butler [5] describes interactions as follows: ‘Individuals and organisations interact to find the right party with which to exchange; to arrange, manage, and integrate the activities associated with this exchange; and to monitor performance. These interactions occur within firms, between firms, and all the way through markets to the end consumer. They take many everyday forms – management meetings, conferences, phone conversations, sales calls, problem solving, reports, memos – but their underlying economic purpose is always to enable the exchange of goods, services, or ideas.’

This definition sees interactions as enablers of the exchange of goods, services and ideas and identifies the forms that these interactions may take. It is not specifically oriented towards inter-firm interactions. The other definition by the IMP Project Group [19] in the context of industrial market relationships describes the inter-organizational interaction process as episodic and involving four elements of exchange between two parties: product/service, information, financial and social. Inter-firm relationships are seen to be based on routinization of exchange episodes and development of contact patterns based on the exchange of information between the two parties. This definition is different from the previous one in that it does not limit the definition of interaction to the communication of information but includes other types of exchange such as that of goods as services as well. Each exchange episode may involve one or more of the four elements. The shortcoming of this definition is that it is quite definitive about the elements of exchange and does not consider the sharing of knowledge separately from information nor does it consider the purpose of the interactions or modes of interaction employed. This paper adopts a more general definition of B2B exchange by Levine and White [26, p.588] and sees B2B interaction processes as ‘…any voluntary activity between two organizations which has consequences, actual or anticipated, for the realization of their respective goals or objectives.’ These interactions can either be conducted face-to-face or be technology mediated. Further, interactions between two organizations do not take place in isolation, they are influenced by the interactions that each of the two organizations has with other members of the multi-firm network as well as by the external environment.

III. Configurations for Interorganizational Interactions

Miles et al [28] see an organization as “both an articulated purpose and an established mechanism for achieving it”. Strategy, structure and process are closely interlinked since organizations pursue their strategies through structural and process mechanisms. Snow et al. [33] notes that there is no perfect way to design an organization and each organizational form from hierarchical to network form have
goals and uniqueness. Lejeune and Yakova [25] identified four types of configurations in interorganizational networks based on the work of [12] and [31]. According to [12] four relational forms appear to be fundamental to most forms of social interactions: market pricing, authority ranking, equality matching and communal sharing. The market pricing relational form is one based on socially meaningful rates such as prices, wages and rents. Authority ranking relationships involve people in asymmetric positions in a hierarchy. Equality matching relationships are those in which people keep track of the emerging difference between participants and what is required to restore the balance. Communal sharing involves people treating a group as equivalent to the given domain. Building on this conceptualization of relational forms, Sheppard and Sherman [31] identified four forms of interdependence based on depth (i.e., intensity) and form (i.e., the directionality of dependence): shallow dependence, deep dependence, shallow interdependence and deep interdependence. The term dependence implies that the nature of dependency is unidirectional. Shallow dependence involves a transfer of responsibility from one party to another and relates to Fiske’s market pricing relational form. Shallow interdependence involves parties coordinating their behavior in order to achieve their objectives and is associated with the equality matching relational form. Deep dependence relates to the authority ranking relational form and involves a principal-agent type of relationship with knowledge based asymmetry. Deep interdependence involves parties having a greater and wider-ranging reliance on each other and is associated with the communal sharing relational form.

Based on these ideas of relational form and depth and form of interdependence, Lejeune and Yakova [25] distinguished between four types of network configurations. The constructs of trust and decision-making are used to characterize form of interdependence while the depth of interdependence is characterized by information sharing and goal congruence. The four configurations are as follows:

- **Communicative**: This type of configuration is related to the market pricing relational form and characterized by shallow dependence. Collaboration only takes place at an inter-functional level within each company in the network. Trust between companies is reliability based (or contractual), i.e., based on past experience companies rely on the fact that contractors will deliver on their commitment [20] and focus on getting the best deal possible. This leads to situations where a number of competing suppliers may bid for a particular item required by a manufacturer [35]. The decision making process is myopic [37], i.e., supply chain members make their decisions in an autonomous manner. There is a lack of commonly pursued goals and a strong inclination towards opportunistic behavior amongst members.

- **Coordinated**: This configuration is related to the authority ranking relational form and characterized by deep dependence. These types of supply chain networks are dominated by a lead organization ([1], [15]) and exhibit a combination of both reliability and deterrent-based trust [25]. Deterrence-based trust is based on fear of consequences if trust is violated and is necessary when a relationship is based on little prior knowledge [22]. Supply chain decisions are imposed by the lead organization and are therefore myopic and asymmetric [8]. Goal congruence is characterized by ‘fate control’ being exercised by the dominant organization [23]. Information sharing takes place on a supply chain-wide basis and can include product, process and transaction-related information [25]. Examples of coordinated supply chain configurations can be seen across different industries and include the networks of Toyota [11] and Li & Fung [14].

- **Collaborative**: This configuration relates to the equality matching relational form and is characterized by shallow interdependence. Trust in this context is reliability, competency and goodwill (openness) based. Competency based trust refers to the confidence in a supply chain member’s capacity to meet commitments. The openness component of goodwill trust means that a supply chain member feels it can share critical information and projects with other members [20]. The decision-making process is dyadic, parity-based and centralized. The parity-based setting implies that each member has equal say in the decision-making and the centralized nature of this decision-making implies that the decision power for a focal function rests with a specific member [17]. Vendor managed inventory provides an example of such centralized parity based decision-making [7]. Goal congruence is strong for the focal function but weak for other functions. Information sharing takes place on a supply-chain wide basis for the focal function but is limited to nearest-neighbor basis for other functions.

- **Co-operative**: This configuration relates to the communal sharing relational form and is marked by deep interdependence. The term co-operation was introduced by [4] and has come to signify cooperation between companies producing and marketing the same product and operating at the same stage of a supply chain [3]. It is viewed as an example of lateral collaboration in which competitors share resources and private information [32]. Trust in co-operative supply chains is based on reliability, competency and goodwill (openness and benevolence). Unlike collaborative supply chains information sharing is also predictably low, sporadic and on a nearest-neighbor basis [25].
co-opetitive ones exhibit both components of goodwill trust - openness and benevolence. Benevolence refers to the belief of a supply chain network member that another member will act in the best interests of the former [34] even when there are opportunities to act otherwise [35].

Decision-making is dyadic and parity-based and the scope is extended to more than one function unlike the case of collaborative supply chains. Supply chain network members pursue a set of commonly agreed upon goals, i.e., there is true goal congruence [25]. Information sharing occurs on a wider scale than in other configurations and involves exchanges with competitors [32]. An example of co-opetitive activities in supply chains is provided by the lateral transshipment of inventory between competitors [16] which may require nurturing a web of information flows between all members of a supply chain [18].

This classification of configurations does not explicitly take into account the evolving nature of relationships in the network over time and the dynamic nature of resources and capabilities which form the basis of interdependence as suggested by [13]. However, this configurational approach demonstrates a strong interrelationship between interorganizational interaction processes and network structure. If strategy dictates network configuration, then interorganizational interaction processes and structures represent the outcomes of network strategy.

Both collaborative and co-opetitive configurations (and associated structures and processes) are challenging to implement. The Voluntary Interindustry Commerce Standards (VICS) Association’s Collaborative Planning, Forecasting and Replenishment (CPFR®) process framework provides a somewhat detailed prescription for collaborative interorganizational interaction processes. Though implementation of these processes involves a learning curve, the experiences of a number of high profile organizations across industry sectors suggest the usefulness of collaborative configurations.

IV. CPFR® (Collaborative Planning, Forecasting and Replenishment)

CPFR® was published by the VICS Association in 1998 and significantly revised and updated in 2004. The CPFR is a business practice that “links sales and marketing best practices, such as category management, to supply chain planning and execution processes to increase availability while reducing inventory, transportation and logistics costs” [36, p. 5]. CPFR has been applied to various industry contexts including retail, apparel, hard goods, consumer packaged goods (CPG), the Chemical Industry Data Exchange (CIDX) and the RosettaNet Collaborative Forecasting standard for high-technology companies. The model identifies four collaborative activities for the manufacturer as seller and the retailer as buyer: strategy and planning (establishing ground rules for the relationship, determining product mix and developing event plans), demand and supply management (projecting consumer demand and order and shipment requirements), execution i.e., the order-to-cash cycle (placing orders, preparing and delivering shipments, receiving/stocking products, recording sales transactions and making payments) and analysis (monitoring planning and execution, aggregating results, calculating performance metrics and sharing insights for continuous improvements). Collaboration may focus on all or a subset of these activities. There are eight tasks associated with the four activities: collaboration arrangement and joint business planning (strategy and planning), sales forecasting and order planning/forecasting (demand and supply management), order generation and order fulfillment (execution) and exception management and performance assessment (analysis).

Challenges for CPFR Implementation in Practice

Parks [29] cites a number of examples of successes with CPFR. Wal-Mart was one of the earliest adopters of CPFR, and realized benefits even from its early pilots with Sara-Lee and Warner Lambert. The benefits included improved in-stock levels, reduced lead times and increased sales. Kmart’s first CPFR program with Kimberly-Clark also resulted in significant in-stock and sales improvements. Walgreens’ pilot with Schering-Plough resulted in increased forecast accuracy across all Schering-Plough items. However, the widespread adoption of CPFR would require overcoming significant hurdles [30]. These challenges posed may be technological or cultural. Praskey [30] quotes Elaine Smith, Senior VP at the Food and Consumer Products Manufacturers of Canada, who suggests that successful implementations of CPFR would require retailers to link point-of-sale data to the backroom and the warehouse and have the necessary trust and willingness to share point-of-sale information with trading partners.

Learning from CPFR Implementations

The implementation of CPFR can be a learning experience for the companies involved. Hewlett-Packard realized soon after their initial CPFR deployment, that their new processes were generating interactions around demand, not supply, and consequently expected benefits were not materializing. Overhauling their implementation meant implementing collaborative end-to-end planning. This led to smoother product launches and improved response times. [9] Motorola’s experience of successful CPFR implementation with a retailer suggests more evidence of learning along the way to developing a mature CPFR process. A deeper cultural alliance involving peer-to-peer relationships across organizational boundaries, common goals and measures and formal communication points and processes were found to be essential. Both participants had to focus on improving their supply chain visibility and adopting a common
calendar for planning. A phased approach to implementation and strong executive support were also found to be of great importance to success. [6]

V. Discussion - An Opportunity for Dialogue between Industry and Academia

Both from the perspective of the academic literature on configurational approaches ([25],[33]) and the experience of organizations implementing the VICS CPFR process framework there appear to be strong interlink between inter-firm strategy, structure and interaction processes. Neither the configurational approach nor the CPFR process framework provides adequate guidance for managers regarding learning and change. Motorola, for example, realized that coordinated changes to structure and processes of both participants in a successful CPFR effort [6]. A way forward could involve incorporating configurational approaches with other theoretical perspectives that take the resource and capabilities essential to interdependence and assist in generating predications and prescriptions of use to management. Experiences of practitioners from the implementation of industry frameworks like CPFR could also enrich the development of theory in this context. Ultimately, the goal needs to be one of developing theories that are of use to academics and industry practitioners alike.

References

Background of Authors

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