INNOVATIVE APPROACHES TO COLLABORATION IN THE SUPPLY CHAIN

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ABSTRACT

Innovation within logistics organisations does not occur in isolation. Most innovation occurs in response to environmental factors outside the direct control of management. The logistics function is increasing in its strategic importance as more and more firms in developed economies such as Singapore and Australia are forced to compete globally to survive. In such a dynamic environment, logistics business must innovate; and to benefit from innovative technologies, systems, processes and practices, organisations must consider the nature and extent of inter-firm relationships with customers and suppliers. In seeking to develop a portfolio of relationships that minimise risk and maximises returns, logistics organisations need to develop innovative practices and processes of managing this portfolio.

The key objective of the study was to investigate how collaborative relationships enhance innovation in the supply chain. The study adopts an iterative process of data collection by conducting ten case studies (5 in Singapore and 5 in Australia) comprising interviews with twenty-three managers and visits to observe the operations of Distribution Centres. This study provides important lessons for managers in logistics organisation in Australia and Singapore and demonstrates how differing relationships can impact on the operation of firms and their capacities to innovate.

1. INTRODUCTION

Organisations are required to relentlessly restructure and re-engineer to increase their effectiveness and satisfy customers. In the midst of this pursuit of excellence, they also need to measure their competencies needed to achieve competitive advantage. This realisation requires firms to span beyond their companies' organisational boundaries to evaluate how the resources of suppliers and customers can be utilised to create exceptional value. Integration, cooperation and collaboration require aligned objectives, open communication, sharing of resources, risk and rewards. These are mandatory for innovative and leading firms in the logistics sector. Chapman, Soosay and Kandampully (2002), advocate that firms have been forced to restructure both internal and external relationships to respond flexibly, innovatively and rapidly to shifting and splintering market demand. This recognition has created a major increase in importance of the value chain, inherently linked to the idea of relationship networks. Firms need to successfully collaborate and strategically align their work processes with supply chain partners. Authors have supported the benefits of cooperative relationships, integration of processes and information systems, and inter-organisational problem solving in logistics (Glaskowsky, Hudson, and Ivie, 1992; Cooper and Ellram, 1993; Pfohl, 1994; Cooper, Lambert and Pagh, 1997). Collaboration implies cooperation and some form of strategic alliances between two or more organisations. There is a variety of economic reasons for the formation of inter-firm collaborations. These collaborations are formed for sharing the costs of large investments, pooling and spreading of risk, and access to complementary resources.

Establishing and maintaining genuine partnerships requires a considerable investment of time and resources. It is important for companies to identify those key relationships for which partnering would create exceptional advantages and to manage supplier and customer relationships with appropriate expectations. The decision to partner will be influenced both by the attractiveness of mutual benefits and by facilitating factors such as cultural compatibility. For example, the partnership between Coca-Cola and McDonald's is enhanced by the fact that both are the leaders in their industries. Coca-Cola is McDonald's largest supplier, and McDonald's is Coca-Cola's largest customer (Fiksel et al, 2004). Not every relationship will be a true partnership. It frequently requires robust communication and collaboration with customers and suppliers. In certain cases where industry standards are desirable, broader collaboration may be warranted among a group of companies within an industry segment (Fiksel et al, 2004).

2. Collaborative Relationships

Collaboration seems to be the highest level of relationships in which different levels of trust and commitments are required and expected to lead to different outcomes. Collaboration is viewed as a type of horizontal integration amongst companies involved in related activities that agree to exchange technology and information (Smith, Dickson and Smith 1991). Likewise, Nielsen et al. (2004) assert that collaboration can be seen as partners' interdependence with eagerness to share goals and vision and combine activities and exchange resources (such as technology, information).

Collaboration implies working more closely with a shared vision and trust as it is seen in effective supply chain management (Lee and Billington, 1992). Long term working and seamless linkages (Krause and Ellram, 1997) and the united seeking of synergies and goals, joint efforts (Nielsen et al, 2004) joint planning and processes supported by high degree of trust and commitment are some other factors that differentiate collaboration from cooperation. Sheppard and Sherman (1998), argue that trust is the recognition of the risks associated with the interdependence inherent in each relationship. Trust involves the faith or belief in the partner's honesty (Spekman, Kamaulf & Myhr, 1998; Anderson and Narus, 1990), and the reliance that it will fulfil its obligations. Trust is indispensable in collaborative process, and can result in lower transaction costs, easier conflict resolution, or a lower need of formal contracting (Das and Teng, 1998).

2.1 Strategic Alliances

Although there is a large and growing volume of literature on strategic alliances, the research is fragmented and the definitions vary (Vyas, Shelburn and Rogers 1995). Strategic alliances are broadly viewed as a particular mode of interfirm relationships, intended to be long term, in which two or more partners share resources, knowledge and capabilities with the objective of enhancing the competitive position of each partner (Spekman and Sawhney (1990). Lorange and Roos (1991) assert that strategic alliances can be effective ways to quickly disseminate new technologies, to penetrate new markets, avoid governmental controls, or to quickly gain knowledge from industry's leaders. Different but complementary theories can be used to explain why companies form strategic alliances. Williamson's (1979) Transaction cost theory focuses on the minimization of costs and risk to adapt to an uncertain environment. Resource dependency theory concerns obtaining resources (Glaister, 1996) and therefore a shortage in one or more strategic resource forces organisations to form strategic alliances. This is also a means of minimising uncertainty and managing dependency (Hynes and Mollenkopf, 1998). Organizational learning is viewed as a means of companies gaining and retaining competencies and therefore be able to either adapt to the uncertain environment (Kogut 1988). Finally, under the strategic behaviour theory organisations seek to enter strategic alliances if their strategic objectives (i.e., profit maximization) can be better met through them (Kogut 1988). Strategic alliances differentiate from other interfirm arrangements on several dimensions (Cravens and Shipp, 1993). First, strategic alliances go beyond a passive investment in another company. Second, the relationship is aimed at a long term view. Third, the organisations involved complement each others contribution not only motivated by efficiency increases but also by equitable outcomes and trusting behaviours (Anderson and Narus, 1991). Finally, a strategic alliance is seen as a horizontal agreement between members of different channels in which commitment is widely acknowledged.

2.2 Joint Ventures

Terms such as joint venture, alliance and network, are used almost interchangeably in related literature (Buttery and Buttery, 1994). This section is concerned with the characteristics of joint ventures which, according to authors such as Baradacco (1991), take the context of shared ownerships. A joint venture consists of the legal formation of a new entity where ownership and management are shared by two (and sometimes more) organisations (Geringer, 1991). Joint ventures are increasingly used to develop new market opportunities, access a new market, share rewards and risks or gain knowledge for the core business (Collins and Doorley, 1991). Oliver (1991) asserts, interestingly, that some determinants (contingence influences) are present in cooperative relationships such as joint ventures, being asymmetry, reciprocity, efficiency, stability and legitimacy. It can be identified under these determinants that joint ventures are used for increasing market power and barriers, sharing information and obtaining synergies in technology, increasing economies of scale, sharing risks in accessing new markets, enhancing profiling industry. Similarly, Cravens and Shipp (1993) argue that the formation of cooperative linkages is driven by some influences such as environmental turbulence and risk and skill-resource gaps. In the case of joint ventures the former is considered the main driver.

Many organisations are urged to seek cooperative arrangements with other organisations as a result of the pressures of fast changing technology, competitive environment, widening of sourcing capabilities and companies strategies (Ring and Van De Ven, 1992). The rationale behind these cooperative efforts is focused on the collaboration and sharing of resources either tangible or intangible as well as the pursuing of some others business goals (i.e., competitive advantage, survival, efficiency) through redesigning of process and products (Cousins 2002). Cooperative efforts are seen as ways to keep pace (Ring and Van De Ven, 1992). They differ on attributes such as the level of trusts, commitment, support from top management and vision (Mentzer et al. 2001). Moreover, Landeros and Monckza (1989) referred to cooperative efforts as interorganisational linkages. They found that, there are some attributes present in those interorganisational linkages, such as joint problem- solving activities, an exchange of information between organisations, credible commitment between the organisations, and joint adjustment to market place conditions among others. The objective of cooperative efforts is to shift from merely contractual arrangements to more trusting relationships with the parties (Kumar, 1996). This shift can encourage the parties (i.e, manufacturers and supplier) to rely upon each other to be helpful and build up trust by taking a long term view of the relationships and dealing constructively with the possible conflicts that arise (Hines, 1995).

Deciding the appropriateness of a relationship for a specific situation seems to be a complex process (Ring and Van De Ven, 1992). The complexity relies on the middle ground position that cooperative relationships cover which some times makes it difficult to distinguish the characteristics, features and limitations of each of the forms of interfirm cooperation. Therefore, it is important to gain an understanding of the significant differences among the cooperative relationships and the conditions when they can be formed to ensure their effectiveness.

3. METHODOLOGY

The qualitative approach and exploratory nature of the research question gave rise to an iterative process of data collection. Research conducted within the qualitative paradigm is characterised by its commitment to collecting data from the context in which social phenomena naturally occur and to generating an understanding that is grounded in the perspectives of research participants (Bryman, 1988; Lofland, 1971; Marshall and Rossman, 1995; Miles and Huberman, 1984). A qualitative approach according to Bygrave (1989) encourages the development of practical and theoretical understanding, as well as the generation of new and alternative theories or concepts. In this case, the data was collected from participants in their working environment using semi-structured interviews. This method allowed the capture of data rich in detail about the research problem; and gave the researcher the flexibility to explore additional issues raised by participants.

The study adopted an iterative process of data collection by conducting ten case studies consisting of interviews with twenty-three managers at Distribution Centres in Singapore and Australia. The case study research according to Yin (1989) may be strictly to describe a situation, but more often it is to understand how or why events occur. As adopted in this study, data came from primary sources by direct interviews with managers in the selected organisations, with the main intention being to comprehend how these firms engaged in collaborative relationships and their importance for successful innovation. The research questions were what forms of collaboration were evident in the firms studied? What is the nature and outcome of the collaboration? Did they promote innovation as a result? The firms have been identified as Firms A-E in Australia and Firms F-J in Singapore.

4. FINDINGS

The findings show that the above concepts affirmed the capability for firms to benefit from such collaboration. The managers interviewed explained that collaboration was carried out through sharing information and resources such as strategic information, forecasts, sales, inventories and promotional plans. It was essential to rely on partners' trust and creditability when collaborating with them. There was some form of joint financial ventures, decision making and strategic planning when integrating operations with partners. In addition, the basis of trust facilitated the collaborative linking externally with partners in the supply chain. The strategic collaboration with partners in the supply chain is important for all members to work together to be successful. They should pool and utilise resources together efficiently such that each party reaps benefit from the collaboration. It concerns the intelligent use of combined resources which enables both the customer and the supplier to not only share cost and risks, but to also reduce overall costs through the elimination of duplicated effort, and to improve quality. The findings discovered six initiatives evident in the firms studied. These are further illustrated as follows.

4.1 MAINTAINING STANDARDISED OPERATIONS

The firms studied had standardised operations in their dealings with most customers and suppliers. In the literature, White (1999) states that a company which implements collaborative supply chain planning must thoroughly integrate the new process into its existing operations, processes and culture. The managers interviewed maintained standardised operations by documentation. Most of the operations and dealings were kept as Standard Operating Procedures (SOP) on paper or computerised. There were regular meetings conducted with suppliers and customers to update or reflect changes in the documentation. The managers stated the need to consider the environment or technological improvements in updating the SOPs. However, Firms F and H faced problems with the smaller customers who had different requirements, and needed to have modifications day to day, depending on their production type. These smaller customers have difficulty interfacing with their system or working with different operating systems and it was difficult to standardise for all. There was variation for reporting, invoicing, closing of accounts, and special personnel involved. The warehouse manager in Firm E expressed concern that smaller customers' agreements were mainly verbal, and may change from day to day.

The findings showed that the ten firms studied had different practices in standardising processes and procedures. For instance, Firm A was a small company and kept processes as simple as possible for their customers. However, there was a requirement to stay abreast with large suppliers for automation and computerisation. Firm B on the other hand, maintained standardised operations with all of their customers and suppliers. Being in the automotive industry, all of their suppliers and customers had computerised systems, and most operations were carried out electronically. Firm E being in the refrigeration business, had a different set of accredited operations known as Hazardous Analysis of Critical and Control Points (HACCP). The operations manager stated that customers normally would like to know if the company has a HACCP certificate. When they include this HACCP Plan in the paperwork, the customer would be aware that the organisation was strictly monitoring their equipment. Everything was documented and coded into the computer. This indicated if their products were working within a temperature range (i.e. -20 to -10 degrees Celsius). The customers had the right to check or inspect such documentation to reassure their confidence in Firm E. The HACCP certification also allowed the firm to export to various countries.

4.2 JOINT PLANNING WITH CUSTOMERS AND SUPPLIERS

All firms (except Firm E) had some form of joint planning with their customers and suppliers. They planned with customers on marketing, promotion and advertising of products. They were able to gauge sales forecasts, plan on new product launches and ensure appropriate stock levels. Firms G and J that involved manufacturing planned for production schedules and forecasts. The production managers in these firms mentioned that they planned with suppliers on the materials requirement for production, and with customers on the marketing of new products. Planning can facilitate the use of VMI (Vendor Management Inventory) and JIT (Just In Time delivery).

By joint planning with customers, firms could design ways to carry out operations with minimum interference, and effectively manage inventory at the Distribution Centre. For instance if there was a promotion campaign anticipated, provisions could be made for huge volumes or excess capacity storage. Firms B, C and D jointly set benchmarks and Key Performance Indicators with their suppliers. This indicated a strong interaction and communication among them. The operations manager in Firm F stated planning with suppliers on interfacing with each other, how to improve and be more efficient. With the customers, they joint plan on ways to carry out operations with minimum interference, as well as the management of inventory at the warehouse.

Nine out of the ten firms had joint planning with partners in the supply chain, and the managers supported this with examples. The literature also viewed that cooperative planning between partners facilitated better matching of supply and demand, and inventory levels. The estimated level of stock planned can be used to guide business operations and prevent the cost of holding too much inventory (Stank, Daugherty and Autry, 1999). The company needs to identify its problem areas, or areas where it seeks improvements, and clearly map out what it wants to achieve through collaborative planning (White, 1999).

4.3 SHARING INFORMATION WITH CUSTOMERS AND SUPPLIERS

All the firms except for Firm H, shared information and knowledge with their suppliers and customers. There were different content and modes of information shared by the firms. In Firm A, this exchange of information and knowledge was with selected suppliers only. They included aspects of promotional events, buying group seminars and conferences, and written communication. The firm was also able to access some supplier databases through their internet websites. In turn, they shared strategic information with suppliers on customer orders, to let them know how much stock to produce. Firm B exchanged information freely with suppliers and customers on the SOPs that included installation notes, rates chargeable for fitting accessories to vehicles (such as installing a CD player, various models of stereo system, or an aerial on the vehicle). Firm C shared information and knowledge through a Balance Scorecard system. It entailed information from the company vision, strategies, critical success factors and measures on how to achieve them. Information was also shared on performance measurement system for strategies (which were derived from the vision and strategy, reflecting the most important aspects of the business), financial information, customer information, processes, learning and innovation perspectives.

Firm E shared information and knowledge to smaller customers by providing advice and assistance. They shared on areas of transportation, despatch issues and technology application. The operations manager in Firm F stated that information was made available only to subscribed customers and suppliers with special access to their website. The website contained information related to their Distribution Centre management system, inventory system, and operations. Strategic and financial information was limited to published material in annual reports, press conferences, magazines and newsletters. The managing director at Firm J reported that certain strategic information was shared only at annual conventions, conferences, and seminars, where they were invited to present and impart their experiences with other organisations.

The findings show that some firms were more protective of their information based on how much they shared. Each had its own strategies and reasons for the exchange of information. Frankel, Goldsby and Whipple (2002) state in the literature that one of the keys to collaboration is enhancing communication between partners in the supply chain. However, readily sharing information is not an easy proposition for most people or firms. Traditionally, information has been a source of power in the supply chain and as such, it is often hoarded and protected (Frankel, Goldsby and Whipple; 2002). As a result, a high degree of trust is required in sharing information.

4.4 SHARING PROCESSES WITH CUSTOMERS AND SUPPLIERS

The finings showed that only Firms A, C, E, I shared processes but to a small extent only. Three of them were Australian firms, whilst Firm I was the only Singaporean firm. Firm A integrated training with its customers. The management organised and coordinated training courses. This was to enable customers gain full understanding of what their requirements are, and use the right terminology in future orders. Firm C shared processes on purchasing and some management aspects, whist Firm E engaged in quality management process and HACCP with their suppliers. Firm I alternatively, collaborated with partners on recycling. The IT manager explained the incentive programmes where customers get a discount on the service charge for pallet returns. This is because they help the firm to save costs. Other incentives were given to customers for reverse logistics such as the refurbishment and minor rework of damaged products. This was to get them back into saleable condition. These schemes enabled customers to be more proactive in observing policies and procedures that they have set, as explained by the managers.

There was no sharing of processes in the other six firms because all the operations and functions were clearly defined. Processes were clear-cut and contractually agreed at the beginning such that there was no overlap of responsibilities. These managers gave other instances where they shared costs such as in Firm H, and sharing information on how to process stock orders and run operations as in Firm J. The findings show that there was little sharing of processes among the firms. This is also stated in the literature by McAdam and McCormack (2001). In their study, they discovered that there is little evidence of organisations actually exploiting the integration of business processes in their supply chains. They contend that even other authors did not write much about this issue. Business process management techniques were applied to a single firm, although the concept was not bound by company limits, while supply chain research tended to focus on the relationships between organisations (McAdam and McCormack, 2001). They further concluded that to have process integration throughout members in the supply chain, there cannot be a fixed boundary between partners. The supply chain must be managed as a single organisation.

4.5 *JOINT INVESTING WITH CUSTOMERS AND SUPPLIERS*

The findings show that half the firms studied joint invested with suppliers and customers. The types of investments are illustrated in the following table.

Areas of investment	Percent of firms
Technology	30%
Capital investment	30%
Research and development	20%
Vendor Management Inventory	10%
Marketing	10%

Table 1 Areas of joint investment by selected firms

The highest areas of investments with suppliers and customers are in Technology and capital investment. Some firms saw the need to keep abreast with technology for better communication, and coordination of processes. Interfacing with partners in the supply chain maximised efficiency and sped up processes. Firm A had jointly invested with some suppliers in the installation of Electronic Data Interface. Other firms pronounced the important aspects in technology and expertise. Firm I invested in a new software (SAP) with their customers. The IT manager explained that they initially financed the software installation, SAP implementation and customisation costs, and then amortised it over the contractual period, so that customers can pay back in instalments. Capital investment was evident in Firms B, C and I; and included long-term projects, equipment and storage facilities.

Firm A jointly invested in marketing projects. They rendered assistance to suppliers for advertising building materials and new product launch. Only Firms G and J that dealt with production and manufacturing, had some joint investment in R&D. These managers mentioned sharing costs with some customers on innovation projects, new product development and production methods. Firm G invested with some customers on Vendor Management Inventory (VMI). This method offered many benefits including substantial cost savings due to more efficient control of inventory levels, inventory receipts, shipments, returns and adjustments. In addition, it provides extensive screen enquiry and reporting functions to give the detailed, current information about quantities, prices, item movements and sales history that is crucial for effective inventory management. Other authors have also supported the joint investment strategies of partners in supply chains. Most of them share costs in the area of ICT for improving processes and communication between firms. Westervelt (2002) even states that in the logistics industry, there has been massive joint investment in the area of IT over the past few years. However the findings show that even in a small sample, innovative collaboration is poorly developed with only 20 percent of firms investing in research and development. All the firms studied generally appeared to be risk averse.

4.6 *SYNCHRONISING AND INTERFACING WITH CUSTOMERS AND SUPPLIERS*

All firms (except Firm D) had some form of operational synchronisation and interface with their suppliers and customers. Firm D still maintained the traditional method of receiving orders through telephone and facsimile and administered paperwork. The other nine firms linked up ICT to operate and communicate through web-based, intranet, the internet, or EDI. However not all customers or suppliers were able to interface this way. The information for those smaller firms ones had to be keyed in manually. The managers interviewed in Firm J explained the need to use two different software packages for different processes. For instance, customer service operations deployed an in-house system. It was different for the distribution system, warehouse management system, factory manufacturing planning system and transportation system which used another system and was linked to supply chain partners. In their dealings with international customers, the logistics manager expressed the view that a few of them had different and incompatible systems. As a result they had to rely on other forms of data exchange such as facsimile and letters. Apparently, this was manageable and not considered a big issue, as the number was small.

5. DISCUSSION

The findings in this study show that there was collaboration in the ten firms in the supply chain. The managers gave examples and explanations of how their firms integrated with suppliers and customers. They were able to set procedures in their dealings with partners, sharing information and processes, and subsequently joint-planning and investing with them for better operations, systems and processes in the supply chain. Similarly, the literature supports the strategies and objectives shared by the firms interviewed. La Londe and Powers (1993, p.11) propose that "the logistics executive of the future will require both horizontal (cross-functional) and vertical (supply chain) information capability to effectively contribute to the competitiveness of the firm." Logistics executives at integrated firms reported significantly better performance with respect to improved customer service, productivity improvements, reduced costs, improved strategic focus, cycle time reductions and quality improvements (Daugherty, Ellinger and Gustin; 1996). Similarly, Keller (2002) states that the competitive market pressure within today's contemporary business environments has encouraged the partnership of many supply chain members. Of particular interest is the development of successful relationships between firms in an effort to gain product and service quality and efficiency. There is a need for supply chain members to foster healthier relationships to realise success and obtain the benefits associated with external partnerships (Keller, 2002) Similarly, collaboration with partners in the supply chain can expect to realise reduced overall costs for the firms (Stank, Daugherty and Autry; 1999). In a partnership, the customer and supplier commit to Continuous Improvement and shared benefits by exchanging relevant information and by working together to resolve problems (SMMT and DTI, 1994).

The open exchange of information and coordinated decision- making in supply chain partnerships can increase efficiency as reported by the firms interviewed. This collaboration is characterised by the level of investment and mutual trust. Longer-term commitment to the partnership encourages members to invest in further improvement of the joint supply chain to mutual advantage (Corbett, Blackburn and Van Wassenhove; 1999). This was evident with Firms A, B, G and I jointly investing in technology. The nature of interaction and the interface with partners had an important influence on supply chain activity. The firms realised that by working together, they were better able to serve the end customer, and at the same time enhance their own profitability. This collaborative strategy according to Bommer, O'Neil and Treat (2001), enhances their position for maintaining and improving their competitive advantage. All the six initiatives discussed in the paper provide management with some insight for future decisions and relationships to engage in with different suppliers and customers. They may contend to work on the basis of contractual agreements (e.g in Firm F), cooperative partnerships (sharing inventory, processes or information) or entering into alliances (s.g. joint strategic planning and joint investing).

It is acknowledged that there are some limitations to the study. The research into the initiatives to integrate internal operations in logistics firms was essentially exploratory and as such, only investigated how these firms collaborated with their suppliers and customers. Examples were given to illustrate their application. The responses from managers were difficult to quantify or gauge the extent of these factors. They tended to give a somewhat optimistic and possibly biased view most of the time, portraying their firms to be successful and innovative. It was also difficult to compare across organisations in some aspects because the scope of a particular collaboration was not well known and hard to assess which firms were more innovative or successful as a result. The challenge facing Distribution Centres is strategically integrating their operations such that they are able to meet the demands of this dynamic industry. Management was conscious of the need to determine and prioritise efforts to save costs and satisfy customers and at the same time collaborate for efficient allocation of resources throughout the supply chain. This study nevertheless provides useful information and important lessons for managers in logistics organisation in Australia and Singapore and demonstrates how such relationships can impact on the operation of firms and their capacities to innovate.

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