

BUILDING SUPPLY CHAIN COLLABORATION: DIFFERENT COLLABORATIVE APPROACHES

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Abstract :

This research aims to examine the characteristics, requirements, benefits, barriers and applicability of various collaborative relationships. Research papers from various sources have been perused as secondary source of data. From these papers, a conceptual framework of various collaborative strategies has been developed. Three types of collaborative approaches (collaborative transaction management; collaborative event management; and collaborative process management) are proposed. The three collaborative approaches are compared and contrasted. Benefits and limitations associated with each type of collaboration are discussed.

Managers can use these approaches to assess current collaborations and seek ways to improve current collaborative efforts. Managers can also use the approaches to develop collaborative strategies across a broad spectrum of relationships in order to determine which type of collaboration best fits each individual business relationship. This research extends previous relationship typologies by focusing specifically on collaborative relationships. The research examines various types of collaborative relationships in order to categorize collaborative approaches in a manner useful to academicians and practitioners.

Keywords: Collaboration, Co-operative marketing, Information sharing, Supply chain, CPFR.

Introduction :

Collaborative supply chain initiatives continue to be developed and gain prominence based on the assumption that closer inter-enterprise relationships and enhanced information exchange will improve the quality of decision-making, reduce demand uncertainty, and, ultimately, improve supply chain performance. Recent research studies have shown that collaboration offers promise for improved supply chain performance in several core areas, including increased sales, improved forecasts, more accurate and timely information, reduced costs, reduced inventory, and improved customer service (Daugherty et al., 1999; Waller et al., 1999; Industry Directions, Inc. And Syncra Systems, Inc., 2000; Barratt and Oliveira, 2001; Angulo et al., 2004).

Despite promising results for inter-enterprise collaborative initiatives, it is generally considered that implementation of collaborative initiatives, in general, has been slow (Barratt, 2003; Frankel et al., 2002). One study reports that implementation of Collaborative Planning Forecasting & Replenishment (CPFR) a trademark of the Voluntary Interindustry Commerce Standards (VICS) Association, has been conservative and slower than expected due to factors such as costs, technological barriers, lack of an “easy, plug-and-play” format for Collaborative Planning Forecasting & Replenishment (CPFR), lack of documentation regarding the benefits/Return on Investment (ROI), and confusion about what CPFR really is (KJR Consulting, 2002). Given the limited progress of CPFR over nearly ten years in existence and the confusion surrounding such collaborative initiatives, the objective for this research is to examine various collaborative

relationships in order to compare and contrast different forms of collaboration and to understand the characteristics, benefits, and limitations of collaborative approaches.

The paper begins with the objective of the study followed by the description of the methodology used. A literature review focused on collaborative initiatives as well as a rationale for developing different collaborative approaches have been discussed. Managerial insights as well as future research directions have been provided.

Objective of the Study :

The objective of the study is to identify various types of collaborative relationships.

Methodology Adopted :

Research papers from various sources have been perused as secondary source of data. From these papers, a conceptual framework of various collaborative strategies has been developed.

Literature Review :

Collaboration is defined as occurring when “two or more independent companies work jointly to plan and execute supply chain operations with greater success than when acting in isolation” (Simatupang and Sridharan, 2003). Collaboration allows for synergy to develop among partners and encourages joint planning and real-time information exchange.

In the early 1990s, a collaborative initiative, called efficient consumer response (ECR), emerged in the grocery and consumer packaged goods (CPG) industries. ECR encouraged a philosophical shift from holding information internally to sharing strategic information, developing trusting relationships, and searching for efficiency improvements that would deliver enhanced customer value (Kurt Salmon Associates, Inc., 1993). ECR was expanded and adapted by other industries and served as the launch pad for additional collaborative approaches – including Vendor-Managed Inventory (VMI), Continuous Replenishment (CR), and CPFR. All of these collaborative approaches share a common focus on enhancing supply chain integration through better information sharing. CPFR is perhaps the more evolutionary of these approaches as it includes not only a thorough examination of factors that create uncertainty, such as promotional influences, but also focuses on greater coordination within and between retailers and manufacturers (Barratt and Oliveira, 2001). Each form of collaboration varies in its focus and objectives. Regardless of the collaborative approach taken, however, Simatupang and Sridharan (2003) suggest that the requirements for effective collaboration are mutual objectives, integrated policies, appropriate performance measures, a decision domain, information sharing, and incentive alignment. These requirements demonstrate a need for significant planning and communication to occur between partners, and can require significant resource commitment. Additional studies (Derocher and Kilpatrick, 2000; Mentzer et al., 2000) have affirmed that strong relationships increase the likelihood that firms will exchange critical information as required to collaboratively plan and implement new supply chain strategies. In order for this sharing of critical information to occur, a high degree of trust must exist among the collaborating partners (Frankel et al., 2002). Trust refers to the extent to which supply chain partners perceive each other as credible and benevolent (Ganesan, 1994; Doney and Cannon, 1997). Credibility reflects the extent to which a firm believes their relationship partner has the exper-

tise to perform effectively while benevolence occurs when a firm believes their relationship partner has intentions and motives that will benefit the relationship (Ganesan, 1994).

One important aspect of information sharing as it relates to collaboration is the delineation of the kind of knowledge, explicit or tacit, that results from the exchange of information. Collaborative arrangements involve knowledge transfer that is both explicit (e.g. transactional) and tacit, which resides in “social interactions” (Lang, 2004). More specifically, explicit knowledge is defined by Lang (2004), and referred to here, as knowledge that can be “articulated and codified” in order to be “transmitted easily.”

In this sense, explicit knowledge often involves the exchange of transactional data (e.g. daily sales). Tacit knowledge is more complex as it:

Resides in social contexts that depend on individual and organizational levels (Lang, 2004); is based on expertise that cannot always be completely expressed because it uses heuristics gained over time and through experiences (Blair, 2002); and is difficult to verbalize (Deng and Tsacle, 2003).

By collaborating, firms are able to exchange both explicit and tacit knowledge in order to combine different knowledge streams across contrasting partner capabilities such that new knowledge can be created for mutual benefit (Lang, 2004). This higher level of interaction, referred to by Lang (2004) as embeddedness, among collaborators encourages the exchange of tacit knowledge which coincides with the high degree of trust that accompanies collaborative relationships.

Collaborative Approaches :

Three Types of Collaborative Relationships have been Identified.

We term these as Type I: collaborative transaction management, Type II: collaborative event management, and Type III: collaborative process management.

Type I: Collaborative transaction management is characterized by high-volume data exchange and task alignment centered on operational issues/tasks. The relationships categorized as Type I included scorecard collaboration initiatives and VMI.

Type II : Type II is characterized by joint planning activities regarding events (e.g. new product introductions) and items of collaborative focus, such as promotions.

Type III: Collaborative process management is differentiated by a more strategic collaboration that relies on knowledge sharing as well as joint decision-making. It is characterized by joint problem solving, long-term joint business planning, and more fully integrated supply chain processes. Advanced CPFR, which incorporates order forecasting, is an example of Type III collaboration. Table 1 Highlights thematic characteristics associated with each type of collaboration. The text which follows examines each of the three types of collaboration, describes their distinguishing operating characteristics, and discusses the benefits and drawbacks associated with each collaborative type.

Table I : Different Collaborative Approaches Characteristics

	Type I: Collaborative Transaction Management	Type II: Collaborative Event Management	Type III: Collaborative Process management
People characteristics	Limited person-to-person interaction.	Person-to-person interaction focused on joint decision regarding events and items of collaborative focus	Person-to-person interaction focused on joint problem solving, long-term business planning and developing cross-functional processes. More embedded relationships
Process characteristics	Focus is on data exchange and task alignment. Creation of standardized data for inter-enterprise exchange purposes. “Hand over” then “hand back” process.	Focus is on joint planning and decision making processes associated with specific events and/or issues. Mix of tacit and explicit knowledge surrounding the process.	Fully integrated processes. Higher level of tacit and explicit knowledge surrounding the process. Simultaneity of exchange.
Technology characteristics	Technology configured to manage large volumes of transactional data being exchanged automatically.	Technology configured to combine data associated with events; sometimes outside of each individual trading partner’s enterprise management system.	Technology in place to facilitate flow through of information across trading partners regarding supply chain management activities.
Decision making- degree of involvement	Individual – dependent, monitored and managed generally by 1 or a very small number of individuals.	Departmental or organizational – structured interaction through the identified “team.” Bulk of team may reside within the supplying firm.	Social network or relational – multi-disciplinary team with senior level support within and across each organization. Active participation by the network as a whole.
Collaboration focus	Coordination of information with focus on problem solving generally at the supplier level.	Collaboration on supply chain disruptions – main focus on supply chain efficiencies between supplier and retail shelf.	Collaboration on supply chain efficiencies as well as strategic effectiveness Committed order buys. (continued)

	Type I: Collaborative Transaction Management.	Type II: Collaborative Event Management.	Type III: Collaborative Process Management.
Time horizon	Short-term –analytical in order to obtain problem resolution. Lower levels of front end planning/more task driven.	Medium Range – more problem solving focus that will create incremental impact at store level. More front end planning over specific event or time horizon.	Long term – focused on future planning for advanced supply chain performance. Highest level of front end planning that is information/decision driven.
Classification of return on Relationship.	Reduced problems and/or errors on tasks (e.g., on time delivery, fill rate to DC, inventory turns, adequately servicing promotions).	Improved forecast and trend data. Performances improvements are more impact oriented (e.g., focus on lost sales or improved promotional success). Includes more focus on store level impact by anticipating/adapting to environmental fluctuations.	Performance improvements to focus on future events (e.g., increased sales, new products/new solutions/new ideas, reduced working capital, category growth). Rationing activities to prioritize where the greatest results will arise.
Organizational level	Operational – meeting today’s needs.	Tactical/Managerial – focus on execution of the plan.	Strategic focus on long-term improvement plans.
Information domain	Large amounts of data often at dc level. More reactive/ less proactive data.	Data is generally exception-based. Focus is more proactive/ problem solving.	More future-focused and proactive. May include a central data repository where both parties can access.
Knowledge level	Explicit knowledge.	Explicit with some level of tacit knowledge.	Explicit and high levels of tacit knowledge
Examples	Scorecard collaboration VMI	Initial CPFR Event collaboration.	Advanced CPFR.

Type I: Collaborative Transaction Management :

As the first level of collaboration, Collaborative transaction management is focused on facilitating the exchange of transaction data and is the first step in building a strong base from which more advanced forms of collaboration can evolve. Success in collaborative transaction management is highly dependent upon the ability to standardize transactional data and utilize technology support tools to exchange data automatically. In essence, the level of knowledge gained through this form of collaboration is explicit in that it can be “articulated and codified” in order to be “transmitted easily” (Lang, 2004).

Additional characteristics that define Type I collaboration include limited person-to-person interaction as much of the exchange of information is “hand over” and then “hand back” (meaning that the parties often make decisions separately rather than jointly or simultaneously) across the individual(s) with oversight responsibilities for the relationship. Since, the level of information exchanged in Type I is operational (e.g. daily/weekly) and transaction-driven (e.g. per order, per delivery), the coordination of effort across collaborators is focused on problem solving and geared at developing immediate solutions (e.g. resolving backorders or late deliveries). As such, the returns on the relationship are generally error reduction/problem resolution on standard performance measures, such as on-time delivery, improved fill rate, and improved inventory turns.

The collaborative relationships classified as collaborative transaction management has two dimensions i.e. scorecard collaboration and VMI. Both initiatives serve as vehicles for the exchange of transactional data across trading partners and require only a limited level of human interaction between each organization compared to more advanced forms of collaboration which are explored in the following two sections.

(a) Scorecard Collaboration :

In the scorecard collaborations examined in this research, information is provided on a weekly or monthly basis (depending on the type of scorecard report) at the retail distribution centre level. The scorecard incorporates a host of measures, like on-time delivery, fill rate, lost sales, forecast accuracy, inventory turns, and promotion performance. The manufacturer reviews the reports and identifies KPIs where performance is below the pre-determined goal (e.g. delivery performance below expectations for a specific set of products). Next, the manufacturer works on problem resolution by sharing the data within its own firm to determine a root cause and by working with the retailer to review policies and practices.

In addition, the retailer provides a sales forecast and projected sales units. This is what differentiates scorecard collaboration from other scorecard programs that only provide performance data. The sharing of a sales forecast suggests a level of relational exchange based on trust and a more developed relationship that is not seen in scorecard programs that strictly review performance metrics. The manufacturer uses this forecasting information to prepare order shipments for the retailer. The sales forecast also includes promotional information. Often, all the manufacturers’ SKUs are a part of the scorecard collaboration.

(b) Vendor Managed Inventory :

A standard VMI relationship involves manufacturers and retailers sharing demand and replenishment data via electronic exchange to enable manufacturers to use the information to determine replenishment quantities at the retail distribution centre level (or, in some cases, as retail store level) and to generate purchase orders which are sent to the retailer. There is often a need for manual intervention, in the VMI relationship, even though data is programmed to run automatically. For example, in order for the manufacturer to forecast sales for 200 VMI items across multiple divisions, the manufacturer’s planner

must import POS data into spreadsheets to perform the needed analysis. This manual action encourages the “hand over” then “hand back” process whereby the planner manually analyzes the data and then responds to the customer’s demand planner if any foreseeable problems exist (e.g. lack of inventory to service a promotion).

In this VMI relationship, the retailer and manufacturer agree upon performance measures, including on-time delivery, service levels at the retailer’s distribution centre (no store level data is available), inventory turns and promotion performance – again feeding the culture of collaboration through exchange of transactions and the personal interaction/discussion limited to those transactions.

Benefits of Type I Collaboration :

One of the core benefits of scorecard collaboration and VMI is that the manufacturer is given more information than traditionally exchanged (e.g. monthly promotional plans) providing greater supply chain visibility which enables each party to reduce the number of problems/eliminate errors. This has led to cost reductions and improved in-stock performance which has, in turn, led to increased sales. Additionally, both scorecard collaboration and VMI compel the trading partners to develop a consistent set of data exchange elements and measuring tools. Furthermore, the information sharing begins to shift the mindset toward collaboration, both internally across functions in the organization and externally between trading partners.

This element of information sharing is also evident in instances of VMI studied here. VMI compels internal collaboration within the manufacturer among the VMI planner and production/logistics, warehousing/shipping, marketing/sales (e.g. new product introductions), and information technology/management information systems.

Limitations of Type I Collaboration :

A drawback to scorecard collaboration and VMI is that both are time consuming to set-up and maintain due to the level of detail and the volume of data involved.

Type II: Collaborative Event Management :

In collaborative event management, information exchange and relationship building are focused on joint planning and decision-making around key events/issues (e.g. creating a joint business plan, sharing information regarding new product introductions/new store openings) rather than focused predominantly on transactions (e.g. POS data) as in Type I collaboration. In this manner, both explicit and tacit knowledge is exchanged. The explicit knowledge transfer that occurs is more efficient in Type II collaboration (as compared to a Type I collaboration) because much of the transactional data exchanged is exception-based. As an example, rather than view performance data on 100 SKU’s, only SKU’s with performance outside of pre-negotiated ranges (determined in joint business planning sessions) are identified and reviewed. In other words, the up-front joint planning and decision-making can be used to reduce the level of transactional data exchange.

However, it is the exchange of a greater degree of tacit knowledge that enables a Type II collaboration to perform at higher levels than a Type I collaboration (e.g. tactical/managerial as opposed to operational) since front end planning occurs over longer time periods (mid-range as opposed to daily/weekly) resulting in greater levels of organizational learning. Collaborative event management activities tend to be more oriented towards problem prevention, identification and resolution than collaborative transaction management. The

collaboration at Type II proactively examines where supply chain disruptions, such as stock outs resulting from ineffective replenishment planning or inaccurate forecasting, may occur, and seeks solutions to minimize such disruptions.

The type II collaboration can be divided into two initiatives: Initial CPFR activities and event collaboration. Each of these initiatives is discussed in more detail in the following two sections.

(a) Initial CPFR :

The process begins with a front-end planning document that drives the process by establishing the business plan over a specific timeframe. A sales forecast is created for a pre-determined timeframe. The manufacturer and retailer may each create their own individual sales forecast or just one party may develop the initial sales forecast. The forecast(s) is reviewed jointly by each collaborating firm and any discrepancies are discussed and reconciled. The reconciled forecast is then fed into the manufacturer's production planning process. Retailers involved in initial CPFR activities in our study provide a sales forecast at the distribution centre level or store level depending on the distribution system and product mix at store level. Feed back and recommended revisions (e.g. based on category management/promotional plans) are welcomed by the retailer from the manufacturer. If the manufacturer knows in advance that it cannot fill an order for a particular reason, future orders can be reduced. In the case of new items, the manufacturer generally develops the sales forecast working with sales and category management. These are examples of the tacit elements of information exchange that separate collaborative event management from collaborative transaction management.

Generally, the retailer provides the manufacturer with performance data and an activity report, which compels the manufacturer's planner to look for exceptions (e.g. items that do not meet performance expectations), perform problem resolution, and develop a plan for corrective action. Performance data includes, but is not limited to, fill rate, in-stock performance, forecast accuracy, lost sales, and promotion performance. Regarding frequency, performance information is reviewed daily as well as week-to-week depending on the measure and product.

In Initial CPFR relationships, information exchange and relationship building appear more equally distributed than in Type I where there is a bias toward information exchange at the transaction level. Information can be exchanged electronically or via an internet-based system. The benefit is visible within the supply chain, particularly with store level data. Access to store level data provides the ability to focus on lost sales since that is generally an included measure. This, in turn, can lead to increased sales for both the manufacturer and retailer. In this sense, initial CPFR is oriented more toward preventing potential problems rather than resolving past problems.

(b) Event Collaboration :

Event collaboration grew from the recognition that out-of-stock problems become significantly worse during promotional events as out-of-stock rates can nearly double during consumer demand peaks (VICS, 2004 May). While both manufacturers and retailers cause promotional out-of-stocks, in part due to poor planning and communication problems, VICS (2004 May) estimated that as much as 25 percent of out-of-stocks occurred while the product was in the store, but not on the shelf.

Event collaboration begins with trading partners developing a joint business plan focused solely on events (e.g. promotions, new product introductions). This can be done on a quarterly or annual basis. Retailers and manufacturers work together to determine the impact the events may have on consumer

demand and plan the replenishment process required to execute the event. One of the many drivers of event collaboration is the shift with respect to new product introduction strategies. It has been observed that the new product introduction strategy has changed from a rollout process (e.g. introducing the new product in initial markets and then growing distribution as consumer acceptance increased) to a national introduction process. As many retailers operate nation-wide (or near nation-wide), new products cannot be as easily limited to one regional area (as required in a rollout process) particularly if the retailer has no way to differentiate their buying and ordering processes on a regional basis.

Benefits of Type II Collaboration :

Benefits from Type II collaboration activities observed include increased forecast accuracy, lower required safety stock levels, improved in-stock levels, improved promotional servicing, and increased sales. Another benefit is visibility within the supply chain, particularly to store level data which enhances the capability to analyze lost sales, improve the mix of inventory on the shelf, and ultimately generate additional sales for both parties. Finally, with Type II collaboration, there is greater cross-functional integration within the firm as well. This cross-functional integration occurs due to the front-end planning elements which require each firm in the collaboration to involve the necessary counterparts (e.g. sales, category management, and production) within their respective firms.

Limitations of Type II Collaboration :

Cross-functional integration (or internal collaboration across the internal functions of the firm) is among the largest barriers of Type II initiatives. Given the focus on interpersonal communication exchange, problems navigating the boundaries of internal collaboration become readily apparent when embarking on collaborative event management. Several research participants have discussed the difficulty of gaining internal buy-in for the collaborative initiative as an example of how internal cultural problems can quickly become an inhibitor to collaborative success. Internal collaboration challenges include a lack of trust between demand planners and CPFR teams, ownership issues between sales and supply chain groups, individuals looking at CPFR as the latest “program of the day” which creates an unwillingness to invest in learning about the process and technology tools, internal measurement discrepancies across functional areas (e.g. unit versus dollar sales measures), and a lack of concern for key performance measures outside an individual’s functional area.

In a related manner, another potential barrier is whether or not the order forecast/actual replenishment order matches the jointly determined sales forecast. It is crucial to note that the sales forecast triggered by demand planning activities and the order forecast, which triggers supply replenishment (e.g. via order placement), are two separate types of forecasts. In Type II collaboration, partners jointly determine the sales forecast, but do not collaborate on the order forecast/replenishment process. If, for example, the manufacturer geared up production to meet a higher sales forecast (e.g. due to a promotion) and the actual orders do not match that “ramp up,” it sends a negative signal that can hurt the collaboration and reduce trust among the partners.

Commitment of resources is another barrier associated with Type II collaboration. At one company, its VMI program, a Type I initiative, required one person per customer account, while its CPFR program, a Type II initiative, required 2-4 people depending on the complexity in managing the customer account.

A final limitation with Type II collaboration is operationalizing the requisite suite of technology to move the program to scale. Technological capability and data compatibility are two key issues, particularly given the fact that the proactive problem solving nature of Type II collaboration requires the exchange of both transactional and non-transactional information.

Type III: Collaborative Process Management :

Collaborative process management focuses the collaboration on both demand and supply processes so that true cross-enterprise/cross-functional integration occurs. The primary differentiator in Type III collaboration is that both the sales forecast and the order forecast processes are incorporated into the joint planning and decision-making mechanisms. Collaboration on demand processes (e.g. new product introductions, promotions, customer demand forecasts) occurs to create and enhance supply chain effectiveness (similar to Type II collaboration).

The key distinguishing features of Type III collaboration are the extensive joint business planning process, the generation of an order forecast, and, perhaps most importantly the execution of replenishment orders in accordance with the sales forecast and the order forecast. These factors require both trading partners to routinely agree on purchase commitments and operate according to those commitments. As such, a high level of trust develops through this commitment. This often leads to the creation of communication mechanisms that enable simultaneity of exchange.

Benefits of Type III Collaboration :

Performance improvements in Type III collaboration extend those improvements observed in Type II collaboration and include increased sales growth, improved fill rate, greater promotional planning and ensuring promotions serviced with product, growth on promotional items, enhanced event execution, and improved inventory turns. In addition, there are improvements at store level such as reduced out-of-stock due to greater visibility and enhanced communications.

Ownership for CPFR success is enhanced by the more strategic decision-making and longer planning horizon, and also comes from the security in Type III of more committed order buys. Additionally, the order forecast allows for improvements in various performance measures (e.g. significantly decreased freight rates).

Limitations of Type III Collaboration :

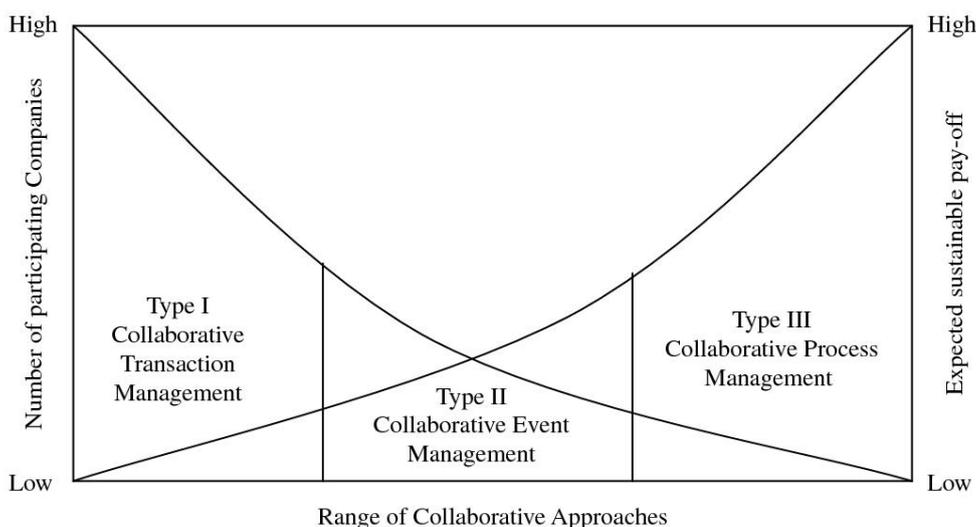
As with Type II collaboration, limitations of Type III generally revolve around technology and organizational barriers. One of the greatest barriers is finding technology that can keep up with the evolving collaborative relationship.

In terms of organizational barriers, issues surrounding internal structure and performance measurement complications have been discussed. For example, with consolidation in the food/CPG industries, a small handful of retailers may represent a significant portion of a manufacturer's sales. Historically, demand planning may have occurred on a national basis, but it is often now moving to a customer specific basis (e.g. key customer accounts may represent 10-30 percent of sales and, thus, require forecasting specific to that individual account). This creates problems in how to structure the organization (e.g. centralized demand planning at corporate or decentralized by customer account). There also remains the challenge of how to measure performance given that at Type III collaboration there is more internal cross-functional involvement. As such, there is a need to develop common measures (e.g. forecast accuracy) that can be used across sales, supply chain, demand planning for a particular CPFR relationship.

Managerial Insights :

From the above study it is clear that there are three types of collaboration and each has its respective benefits and challenges. These three types are presented in Figure 1. This is similar to the findings of Skjoett-Larsen et al. (2003) who suggest that there are three levels of CPFR – initial, expanded, and full scale – which have progressing levels of relationship strength, process integration, and information technology sophistication.

Figure :1 Collaborative Approaches



Collaborating on transactions is the most highly subscribed form of collaboration as it enables the longstanding goal of extracting inventory from the supply chain and manifests itself in initiatives such as scorecard collaboration and VMI. Collaborative transaction management does not require joint decision-making at the level of more advanced forms of collaboration. It is when collaboration moves its focus from transactions to events and activities that joint planning and decision-making occurs more readily among trading partners. In second type, collaboration generally focuses around joint consideration of a particular promotion or on a particular set of items where performance needs to be improved. It is in the collaborative event management that the transition to the development of more tacit knowledge to complement transactional data exchange and the transfer of explicit knowledge occurs. Moving from collaborating purely on transactions to jointly planning events requires a shift in thinking to incorporate trading partners’ input into the decision process. Collaborative event management paves the way to move to collaborative process management.

Each type of relationship implies a different management strategy.

Type I: Collaborative transaction management is best managed by focusing on operational zing information technology tools, building data integrity, and standardizing the information that is exchanged.

Type II: Collaborative event management requires a focus on characterizing the activity or event, standardizing the decision-making process, and encouraging the exchange of pertinent non-transactional information.

Type III: Collaborative process management requires building trust, setting joint business goals and designing inter-enterprise processes to meet those goals – while generating and committing to an order forecast.

Figure 1 is designed to complement Table I by illustrating that as collaborative activities become more advanced, the number of companies participating at that advanced level decreases while the potential, sustainable pay-off increases. As such, it is expected that the number of companies participating in Type III collaboration is much lower than in Type I. Further, as discussed previously the potential pay-off from each type of collaboration supports the hypothesized exponential increase in benefits as collaboration becomes more advanced.

Based on the insights gained from the study, the following propositions are offered :

- P1. There are three distinct levels or types of collaboration.
- P2. There are a greater number of companies participating in a collaborative relationship at the Type I level than at the Type II level.
- P3. There are a greater number of companies participating in a collaborative relationship at the Type II level than at the Type III level.
- P4. There is a greater pay-off for companies participating in a collaborative relationship at the Type III level than at the Type II level.
- P5. There is a greater pay-off for companies participating in a collaborative relationship at the Type II level than at the Type I level.

It has been indicated that progress on one type of collaborative relationship is progress on all types of collaborative relationships. In that any level of collaborative experience enhances capability to build other collaborative relationships. Thus, Supply chain managers can use this typology to baseline their relationships and evaluate the appropriate type of collaboration. Managers need to consider within their business context, questions such as: Does a particular product need to stay in one collaborative relationship type or another? What drives a shift from one type of collaborative relationship to another? How often do we re- evaluate the collaborative relationships and how they are managed? This analysis also needs to incorporate the firm's strengths as well as the strengths of its trading partners.

Managers may employ a mix of collaboration types across a range of products by determining which type of collaboration best fits their business model. Managers need to consider that while collaborative transaction management may be the best fit for standard items, collaborative event management may be the best option for promotional items and collaborative process management may be required for highly innovative items with high demand uncertainty.

Future Research Directions :

The propositions put forth in this work create a path for future studies. Managers could use this insight to make trade-off decisions regarding whether investing in developing advanced stages of collaboration would be justified by the potential benefits and accordingly, could use it as a guide for prioritizing investments in collaboration. Academics could use the information to further advance the study of collaborative structures between trading partners.

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