

Enablers and Inhibitors of Collaborative Supply Chains: An integrative framework

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Abstract

While the merits of Collaborative Supply Chains (CSCs) are broadly appreciated, studies on *sine-qua-nons* in the formation of CSC are relatively limited. This paper systematically reviews the extensive CSC literature to extract critical success factors and challenges, and proposes a generic framework to establish and sustain various levels of CSCs.

Keywords: Collaborative Supply Chain, Critical Success Factors

Introduction

Collaborative Supply Chain (CSC) is not a newborn concept; it never grows old either. In fact, in the struggle against the increasingly dynamic market and customer demand, collaboration appear to be an effective mean for the contemporary firms to leverage the resources and knowledge of their customers and suppliers (Cao and Zhang, 2000), be more responsive (Baratt, 2004), productive (Horvath, 2001), deliver significantly improved performance (Stank et al., 2001), and capacities to innovate (Soosay et al., 2008). That being said, the implementation of CSC seems to be easier said than done (Sabath and Fontenella, 2002; Boddy et al., 2000). Several studies have underlined the barriers, conditions and requirements of CSC (e.g., Baratt, 2004; Fawcett et al., 2008), although in a fragmented way throughout the literature. In fact it appears that the literature largely lacks structured reviews of *sine-qua-nons* in the formation of new and maintenance of established CSC, with help of which, the essential building blocks of SC collaboration can be identified.

It can be observed that CSC collaborations occur in various intensities (Holweg et al., 2005; Spekman et al., 1998). As such, the extent of the ‘chosen’ collaboration commensurate with the extent of interactions, interdependencies and responsibilities between and within the SC partners. Typically, in the CSC literature the pros (of collaboration) are praised and the cons are considered as barriers that should be conquered. In other words, collaboration is the way to go, where some nuances in the possibility of overcoming barriers stem from contingencies and maturity of organizations. However, in this paper it is argued that SC partners might deliberately choose for ‘lower’ levels of collaboration for solid strategic reasons, i.e. that the ‘optimal’ level of collaboration is not always the most intense one. In other words, being lower or higher on the collaboration spectrum is not “good or bad” per se. The SC partners need to consider several trade-offs when determining their ‘optimal’ level of collaboration. Given their contextual peculiarities and organizational idiosyncrasies, including the strategic and tactical needs, different SCs are likely to make different decisions regarding such trade-offs.

Accordingly, the aim of this paper is threefold. Firstly, a theoretical discussion is provided on how various levels or types of collaboration can be described and understood, and what each type entails. Secondly, this paper discusses the factors that drive the success of CSC.

Thirdly, the factors and types of collaboration are integrated into a generic framework that distinguishes several archetypes of SC collaboration along with a set of corresponding Critical Success Factors (CFSs).

The remainder of the paper is organized as follows. First, various types of CSC are discussed. Next, the research method is explained. Based on the results of a structured literature review and the theoretical discussion in next section, the Vehicle framework is proposed. At the end, a synopsis of this research, its theoretical and practical implications, and a research agenda are presented.

Classification of Collaborative Supply Chains

The body of knowledge on CSC is massive (cf., the literature review provided by Burgess et al., 2006; Gunasekaran and Kobu, 2007; and Power, 2005), and a consensus among scholars with regard to CSC definition and classification is lacking (Muckstadt et al., 2001, Stank et al., 2001). Following Christopher (1992, p.17), in this paper CSC is defined as a collaboration within the “network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumers”. According to Simatupang and Sidrihanan (2002, p.19), a CSC is commonly differentiated in terms of its structure: *vertical* (two or more organizations share their responsibilities, resources and performance information to serve relatively similar end customer), *horizontal* (two or more unrelated to competing organizations cooperate to share their private information or resources), and *lateral* (combining and sharing capabilities in both vertical and horizontal manners). Moreover, the intensity of collaboration depends on the impact horizon on chain performance: *short term* (effects on operational performance within one year), *mid-term* (effects on operational performance over one to three years), *long-term* (effects on operational performance over two to five years) (Simatupang and Sidrihanan, 2002). Based on the differences in inventory control and the planning collaboration, Holweg et al. (2005) identify four types of CSC:

- i. Type zero or the *traditional SC* (each level in the SC issues production orders and replenishes stock without considering the situation at either up- or downstream tiers)
- ii. Type one or *information exchange*, (retailer and supplier still order independently, yet exchange demand information and action plans in order to align their forecasts for capacity and long-term planning.),
- iii. Type two or *vendor managed replenishment* (the task of generating the replenishment order is given to the supplier, who then takes responsibility for maintaining the retailer's inventory, and subsequently, the retailers' service levels),
- iv. Type three or *synchronized supply*, (eliminating one decision point and merges the replenishment decision with the production and materials planning of the supplier. Here, the supplier takes charge of the customer's inventory replenishment on the operational level, and uses this visibility in planning his own supply operations).

Spekman et al. (1998) point out that a full-blown CSC requires a transition in suppliers' mind-set and strategic orientation, from open-market negotiations (price-based discussions, adversarial relationships), co-operation (fewer supplier, longer-term contracts), co-ordination (information linkages, WIP, EDI linkages), to collaboration (SC integration, joint planning, technology sharing). From a genealogical viewpoint, Attaran and Attaran (2007) identify an intensified trend of collaboration of SCs in the past decades. In line with Spekman's et al. (1998) classification, Attaran and Attaran (2007) stress that SC solutions have evolved from using EDI and Vendor-Managed Inventory (VMI) to Continuous Replenishment Program (CRP), Efficient Consumer Response (ECR), and more recently, Collaborative Planning, Forecasting, and Replenishment (CPFR). CSCs can also be classified based on the firm's prospective roles into manufacturing/supplier collaboration (e.g., NPD, order fulfillment, and

prospective roles into manufacturing/supplier collaboration (e.g., NPD, order fulfillment, and capacity planning), manufacturer/customer collaboration (demand planning, inventory replenishment) and collaboration with third and fourth party logistics providers (e.g., joint planning of logistics activities) (Sahay, 2003). Wipple and Russell (2007, p.179) propose a typology of CSC, which entails, *collaborative transaction management* (characterized by high-volume data exchange and task alignment centered on operational issues/tasks), *collaborative event management* (incorporates decision-making at the tactical/managerial level rather than just at the operational level), and, *collaborative process management* (which is a more strategic collaboration that relies on knowledge sharing and joint decision-making).

With all that said, CSC (in its various shapes) is not always encouraged as the most appropriate choice for the buyer under all circumstances (Cox, 2001). According to Cox (2001, p.43) successful management of CSC is only possible “by properly understanding of the contextual (power) circumstances that exist between buyers and suppliers, and the range of relationship management choices available to them”. As such, the weaker actors in the SC may not always benefit from collaboration (Turnbull et al., 1993) due to power and dependence imbalance (Matopoulos et al., 2007).

Following the standpoint of Cox (2001), and inspired by various CSC classifications, discussed above, four generic archetypes of collaboration in a given SC can be distinguished in the so-called *4C-Model*, namely:

- C1. *Information-driven collaboration*, SC partners seek to create value by merely sharing (operational) data and information;
- C2. *Operations-driven collaboration*, SC partners improve their operational efficiency by focus on the make-source-deliver (logistics) subject matters;
- C3. *Market-driven collaboration*, SC partners extend their resources and capabilities and improve their market effectiveness by jointly undertake commercial activities;
- C4. *Strategy-driven collaboration*, SC partners operate as a virtual single organization with a single strategy to enable new or novel, often impactful, undertakings.

Although each of the archetypes inherits the attributes of the previous archetype (hinting at a linear evolutionary transformation or degree of maturity), each archetype *de facto* has its own merits and limitations. One archetype is not superior to the other; instead, driven by the individual and collective strategic needs and considerations and consistent with circumstantial power regime (among buyers and suppliers), firms opt for an ‘appropriate’ archetype of collaboration. On this account, the form of collaboration may even vary for different product-market combinations within a single set of SC entities. Although each archetype involves distinctive attributes, the scale, impact or intensity of the attribute differ in each archetype (see Table 1). The ‘discussion’ section elaborates further on the CSC archetypes.

Table 1. An example of the archetypes instantiations

	C1	C2	C3	C4
Data sharing	Sales data, Inventory data	Promotional data, Forecast data, Inventory policies	Know-how on product development	Strategic and financial information sharing
Decision sharing	Defining data query/format	Ordering, Demand forecast, Production planning	Promotion and events, Category decisions	Synchronized policies
Resource sharing	<i>N.A.</i>	IT systems and infrastructure	Human resources, Joint customer support	Factories, warehouses, distribution centers
Risk/reward sharing	<i>N.A.</i>	Stock control, Inventory Management	New Product development	New markets exploration and penetration

Research Method

In response to the second part of this research (i.e., factors that drive the success of CSC), a systematic literature review is applied. The aim was to collect the enablers and inhibitors identified in the previous studies. Presumably, by promoting enablers and preventing inhibitors SC collaboration can be developed and sustained. Largely in line with the Cochrane review approach (Higgins and Green, 2011),

- i. First, several major publishers and databases are scrutinized, including the Social Science Research Network (SSRN), Emerald, ScienceDirect, Wiley Interscience, as well as, search engines Scholar and Scopus. The search aimed at collecting papers that include “Collaborative Supply Chain”, “Networked Supply Chain”, “Cooperative Supply Chain”, “Supply Chain Collaboration”, “Supply Chain Alliance”, and “Supply Chain Partnership”, in their title, abstract and/or keywords.
- ii. Then, the authors read the title, abstract, keywords of the collected papers to assess the relevance of the papers. Any paper that was not focusing on the formation, maintenance or management of collaboration was left out (e.g., publications with focus on specific aspects of collaboration including collaborative forecasting, planning, negotiation).
- iii. The bibliographies of the selected publications were screened (i.e., snowball-sampling), yielding a total sample of 30 publications.
- iv. The final collection of publications was subjected to a full-length review with the aim of collecting a long list of key enablers and inhibitors. In doing so, the authors independently labeled all the enablers and inhibitors (in accordance with open-coding, cf., Strauss and Corbin, 1998).
- v. Once all the inhibiting and enabling factors were extracted, the authors clustered the factors (in accordance with pattern-coding, cf., Miles and Huberman, 1994). In this process, the authors iteratively compared, combined and condensed the induced codes into a set of generic CSFs. In the context of this paper, CSFs can be defined as “a limited set of conditions that SC managers must give special and continual attention to bring about high performing, sustainable collaboration” (adapted from Boynton and Zmud, 1984). In total 19 generic CSFs (classified into four dimensions) were identified, which, in turn, served as the attribute space of an integrative framework (see the discussion section below). The process of clustering was a collective effort, which has continued until a consensus was reached among all the four authors of this paper. In this regard, the authors strived to preserve (or remain close to) the labels and descriptions as presented in the original sources.
- vi. Finally, the 19 CSF's and the earlier discussed 4C-Model were integrated into a generic framework. The framework (i.e., the vehicle framework) is the result of the authors' iterative discussions on alternative ways of integration. In total four sessions of averagely three hours were needed.

For the sake of space limitation, Table 2 presents a part of the output of the literature review. The full table is available upon request.

Discussion

The review of the CSC publications helped to identify 19 CSFs that were frequently emphasized in the previous studies, see Table 3. The CSFs are clustered in four dimensions; namely, strategy, leadership, organization, and practices; together building what has been called the ‘vehicle framework’. As discussed in the second section, CSC can be viewed from four different levels of analysis and, therefore, the extracted CSFs are not equally important at for all four archetypes of collaboration, see Table 4. Below the four dimensions are shortly reviewed.

Table 2 – The Collaborative Supply Chains' Enablers and Inhibitors (partly presented)

Ref	Enablers	Inhibitors (and challenges)	
[1]	<ul style="list-style-type: none"> • Trust • Reliability of supply • Top management support • Mutual interest 	<ul style="list-style-type: none"> • Lack of top management commitment • Poor understanding of the concept • An inappropriate organization structure to cope with the concept • Low commitment from partners 	
[2]	<ul style="list-style-type: none"> • Information sharing is needed to reduce the bullwhip effect. • Collaborative Planning, Forecasting and Replenishment (CPFR) is a promising model to facilitate supply chain collaborations, especially given the growing emergence of e-marketplaces. 	<p><i>Fundamental:</i></p> <ul style="list-style-type: none"> • Trust between buyers and suppliers • Incentive to trust and drivers for collaboration <p><i>Technical:</i></p> <ul style="list-style-type: none"> • Common language for identifying products and making decisions • Linking business processes • Security protocols to safeguard proprietary information 	
[3]	<p><i>Cultural</i></p> <ul style="list-style-type: none"> • External and internal trust • Mutuality (mutual benefits should arise from the collaboration) • Information exchange in SC • Openness and communication • Cross-functional activities • Process alignment • Joint decision making • Sharing performance metrics 	<p><i>Strategic</i></p> <ul style="list-style-type: none"> • Resource and commitment from all participants • Intra-organizational support • Corporate focus on the SC collaboration • Business case • Technology 	<ul style="list-style-type: none"> • Not only developing closer relationships or integrating processes between supply chain-related functions, but also include marketing-commercial, and R&D activities • Not only developing closer information exchange at an operational level, but also at tactical and strategic levels in the organizations across the supply chain
[4]	<ul style="list-style-type: none"> • Given the context people can try collaboration • Reconstruct the context to encourage cooperative behavior • Revised context encourages more collaboration • Informal cooperation experiences will construct formal institutions to support further cooperation 	<ul style="list-style-type: none"> • Collaboration emerges (does not follow from a 'big plan'); in the process unforeseen difficulties will arise 	

[1] **Akintoye et al. (2000)**, [2] **Attaran and Attaran (2007)**, [3] **Baratt (2004)**, [4] **Bobby et al. (2002)**, [5] Cao and Zhang (2011), [6] Cheng et al. (2008), [7] Christopher and Peck (2004), [8] Fawcett et al. (2008), [9] Forrest and Martin (1990), [10] Handfield et al. (2000), [11] Holweg et al. (2005), [12] Horvath (2001), [13] Hoyt and Huq (2000), [14] Kampstra et al. (2006), [15] Matopoulos et al. (2007), [16] McLaren et al. (2002), [17] Monezka et al. (1998), [18] Muckstadt et al. (2001), [19] Myhr and Speckman (2005), [20] Pramatari (2007), [21] Sahay (2003), [22] Serapio and Cascio (1996), [23] Simatupang and Sridharan (2002), [24] Skjøtt-Jørgensen et al. (2003), [25] Soosay et al. (2008), [26] Speckman et al. (1998), [27] Stank et al. (2001), [28] Vereecke and Muyllaert (2006), [29] Welty and Becerra-Fernandez (2001), [30] Whipple and Russell (2007)

*Table 3. The generic Critical Success Factors in CSC
(The numbers in brackets are the references used in Table 2)*

Headlight (strategy)	
1. Collective policy/decision making	[2][3][5][10][18][24]
2. Customer centric added-value	[8][11][13][18][22][26][27]
3. Long-term strategic vision	[10][14][21][26][27][30]
4. Common (strategic) objectives	[3][5][6][8][10][11][22][23][24][25][26][30]
Steer (leadership)	
5. Commitment and participation	[1][3][6][8][10][14][17][20][21][24][26][27][28][29]
6. Collaborative mindset	[1][4][6][8][9][10][15][21][24][26]
7. Open and continuous communication	[3][4][5][6][8][11][19][24][25][26]
8. Project management	[8][20][24][26]
Engine (organization)	
9. Trust	[1][2][3][6][8][9][10][13][14][15][17][19][21][24][26]
10. Collective learning	[4][5][6][7][8][21][24][29]
11. Mutuality	[1][2][3][4][6][9][10][11][14][16][20][21][22][23][24][26][27]
Wheels (practices)	
12. Channels and infrastructure for information exchange	[2][3][5][7][8][11][12][14][15][16][18][19][20][25]-[26]
13. Collective planning and forecasting	[2][7][8][10][23][24][25][27][28][30]
14. Performance System and Quality Management	[3][8][12][14][25][27][30]
15. Business Process Integration	[2][3][5][6][12][16][18][20][25][27][30]
16. Resource sharing	[8][10][11][19][21][23][24][25][26][27][28][30]
17. Cross-organizational teams	[3][8][10][12][24][26]
18. Collective rewarding system	[2][5][8][23]
19. Collective investment and risks	[7][8][15][16][21][25][27]

The Headlight: Strategy

Most CSCs seem ineffective without a strategic vision on collaboration amongst SC partners. For a collaboration to succeed, the partners involved should have decided that collaborative relations are a strategic choice, i.e., that they are willing to invest in the long-term success of the partnership. Inherently, partners share their decisions and policies, place emphasis on the customer's value, and strive to reach a consensus on their collective business goals and constraints (consistent with the partners' individual corporate strategy). Metaphorically, the strategy of a CSC is a 'headlight of a car'; it sheds light on the path along which partners should proceed to achieve their collective objectives.

It is important to note that strategic considerations are not a prerequisite for any form of CSC. In fact, the C1 and C2 collaboration can be established without much emphasis on strategic alignment. However, strategic alignment becomes a necessity at the exchange of critical resources or confidential data, which are part of C3 and C4 collaboration. To further nuance the picture, other part of strategic thinking, like the focus on customers value deserves a focal position in almost all forms of collaboration (all except for C1) and joint decision-making is, at least in some level, for all forms of collaboration.

The Steer: Leadership

Leadership stands out as an essential medium for guiding and steering the CSC undertaking (which has a connotation of 'the steer of a car'). Consistent with the higher-level strategic vision, the top-management should undergo a mind-set shift from individual pecuniary benefits towards joint benefits, and create a shared sense of willingness (without fearful pressure) to collaborate. Management willingness is essential but ineffective if it is not

with committed participation: they need to match their words and thoughts with deeds. In this respect, an open, transparent and continuous communication towards partners and employees is an effective stimulus to collaboration. It also means that leaders need to be capable of managing and coordinating trans-organizational multi-actor projects.

Without commitment and participation of all partners even C1 collaboration is doomed to fail. The need for commitment and participation, however, is higher when more intense types of collaboration are chosen. A collaborative mindset is essential from C2 onwards, wherein the concept of sharing becomes more tangible (in contrast to C1 that is associated with the exchange of rudimentary operational data). Inherently, the need for more openness, formal and informal communication and contacts grows as the intensity of collaboration increases. The leaders capabilities to run trans-organizational projects are reserved for the most interactive forms of CSC, namely, C3 and C4. It would be worthwhile to note that the higher the level of collaboration, the higher hierarchical management support is required. C2 can be handled by logistics managers, for C3 the combined operations and marketing management is needed, and at C4 obviously the CFO and CEO are involved also.

Table 4. The Vehicle framework with various archetypes of CSC (scale: irrelevant to highly relevant)

	C1	C2	C3	C4
Headlight (strategy)				
Collective policy/decision making	◐	◑	◑	◑
Customer centric added-value	○	◐	◑	◑
Long-term strategic vision	○	○	◑	◑
Common (strategic) objectives	○	○	◐	◑
Steer (leadership)				
Commitment and participation	◐	◑	◑	◑
Collaborative mindset	○	◐	◑	◑
Open and continuous communication	○	◑	◑	◑
Project management	○	○	◐	◑
Engine (organization)				
Trust	◐	◑	◑	◑
Collective learning	○	○	◑	◑
Mutuality	○	○	◐	◑
Wheels (practices)				
Channels and infrastructure for information exchange	◐	◑	◑	◑
Collective planning and forecasting	○	◐	◑	◑
Performance System and Quality Management	○	○	◑	◑
Business Process Integration	○	◑	◑	◑
Resource sharing	○	○	◑	◑
Cross-organizational teams	○	○	◐	◑
Collective rewarding system	○	○	◑	◑
Collective investment and risks	○	○	◐	◑

The Engine: Organization

Many studies have underlined the importance of inter- and intra-organizational culture and behavior in establishing a sustainable CSC. In this respect, trust between and within partners is considered as the fundament of any collaboration, as well as, a decisive factor even prior to the formation of a CSC (e.g., in the process of partner selection). The literature tends to consider trust as a firm's joint belief that its SC partners will perform actions in a fair, honest, benevolence fashion. Although the existence and impact of trust is not always evident, lack of it seems to result in a fearful and skeptical relationship between partners, particularly in periods of economic downturn. Besides trust, collective problem solving and learning are at the core of this dimension. Not only to help participating firms to create knowledge, but also

to capture and appreciate knowledge resources. Overall, the presence and preservation of mutuality (i.e., common needs and spirit, language, norms and values) throughout the SC organization and among the employees, is frequently emphasized. After all, in a metaphoric sense, the engine of any organizational relationship can only be fueled with a broad and solid organizational support.

Although trust need to be nourished over time, it seems to be a pivotal ingredient of any form of CSC. Collective learning requires a larger extent of teamwork that is more present in C3 and C4. In a same vein, sense of mutuality is relevant to a full SC collaboration with joint efforts and responsibilities.

The Wheels: Practices

The in the literature probably most broadly discussed dimension of CSC are the practices, where the collaborative visions, thoughts and feelings are operationalized into actions, processes and procedures. Figuratively put, collaboration runs on these practices. This dimension includes aligned channels and infrastructure that enable and facilitate the exchange of data, information and knowledge between SC partners (e.g., to prevent the bullwhip effect, reduce uncertainty, optimize flow, reduce inventory). Once interconnected information and communication systems and technologies are established, SC partners can decide to share more critical data and know-how. As such, collective planning and forecasting can take place. Partners can build and manage collective performance and quality management systems, and gradually work towards an optimized integration of inter- and intra-organizational business processes and systems (e.g., Integrated CRM systems, common data platforms). From an operational viewpoint, also the formation of cross-organizational teams, collective rewarding system and aligned incentives, as well as, collective investment and risks are emphasized.

Once at a strategic level of SC collaboration is the chosen way, firms need to streamline their data and information systems. Collective planning and forecasting, performance system and quality management, and business process integration are tied up with a higher intensity of interaction, underpinned with a stronger unanimity among partners on the overarching business objectives. In C3, partners share more critical resources and capabilities, for instance, in the form of cross-organizational teams. In C4, partners take it a step further and share the incentives, investments and risks, while maintaining their entity (in contrast to a merger or a joint venture).

Conclusion

The contemporary supply chains can barely survive without collaboration. Not only to be able to adequately respond to the rapidly and unpredictably changing market, but also to jointly create new opportunities and innovate. While the merits of Collaborative Supply Chains (CSCs) are broadly appreciated, studies on *sine-qua-nons* in the formation of CSC are relatively limited. This paper systematically reviews the extensive CSC literature to extract the enablers and inhibitors, and proposes a generic framework to establish and sustain various types of CSCs. In contrast to some studies such as Kampstra et al. (2006) who propose “the ladder of collaboration”, encouraging a linear evolution or maturity of CSC, this paper emphasizes that CSCs should not be considered along a dichotomous scale (i.e., no-collaboration versus full-collaboration). Instead, it should be regarded along a continuous spectrum from which firms –congruous with their given context and strategic considerations– deliberately opt for an optimum level of collaboration. As such, a mature collaboration does not imply evolving from a basic interaction to full-fledge collaboration *per se* (horizontal maturity), it means optimizing the collaboration within the confined boundaries of collaboration (vertical maturity). To this end, the Vehicle framework proposed in this paper

provides a generic set of CSFs with various degrees of relevance for different degrees of intensities of CSC.

Although in a preliminary stage, from a theoretical perspective, this paper contributes to a non-trivial debate on CSC formation, measurement collaboration maturity, and how it is related to the SC's overarching strategy that prescribes to embark on collaboration (or not) and with what intensity. More from a practical viewpoint, given a chosen type of collaboration, the proposed framework can be applied to prioritize the steps needed in formation of a CSC or to qualitatively evaluate how well an established SC is collaborating.

Clearly, there are several limitations to this study. Firstly, more publications, and therefore, more collaboration enablers and inhibitors can be extracted from literature, which may lead to more CSFs. To this end, more search keys, publishers, and various streams of literature (such as strategic alliance and partnership literature, virtual collaboration, merger and acquisition) can be used. More importantly, the development of the Vehicle framework is partly based on the literature, and partly on the authors' experience and agreement. Hence, the authors consider the paper as a preliminary step only and as the start of a broad discussion amongst scholars and practitioners rather than an end product.

Secondly, there is a need to empirically validate the proposed framework. Also for this purpose, the framework's theoretical underpinning needs to be further explicated. With qualitative case studies the relevance of the proposed factors can be evaluated. Furthermore, a quantitative study can help validating the classification of factors (e.g. through factor analysis), combined with mediators and moderators. The mediators and moderators can be the SC's given *contexts*, such as, high/low market contingencies, volume-variety, demand fluctuation, governance complexity, service-product dominance, and size. Equally interesting is exploring the collaboration *determinants*, to which the formation or selection of an appropriate intensity of collaboration is dependent. Possible determinants adjunct to collaboration include knowledge protection, market responsiveness, innovation, growth and strategic power.

Bibliography

Akintoye, A., McIntosh, G., Fitzgerald, E. (2000). A survey of supply chain collaboration and management in the UK construction industry. *European Journal of Purchasing & Supply Management*, 6(3), 159-168.

Attaran, M., Attaran, S. (2007). Collaborative supply chain management: the most promising practice for building efficient and sustainable supply chains. *Business Process Management Journal*, 13(3), 390-404.

Barratt, M. (2004). Understanding the meaning of collaboration in the supply chain. *Supply Chain Management: An International Journal*, 9(1), 30-42.

Boddy, D., Macbeth, D., Wagner, B. (2000). Implementing collaboration between organizations: an empirical study of supply chain partnering. *Journal of Management Studies*, 37(7), 1003-1018.

Burgess, K., Singh, P. J., Koroglu, R. (2006). Supply chain management: a structured literature review and implications for future research. *International Journal of Operations & Production Management*, 26(7), 703-729.

Boynton, A. C., Zmud, R. (1984). An assessment of critical success factors. *Sloan Management*, 25(4), 17-27.

Cao, M., Zhang, Q. (2011). Supply chain collaboration: impact on collaborative advantage and firm performance. *Journal of Operations Management*, 29(3), 163-180.

Cheng, J. H., Yeh, C. H., Tu, C. W. (2008). Trust and knowledge sharing in green supply chains. *Supply Chain Management: An International Journal*, 13(4), 283-295.

Christopher, M. (1992). *Logistics and Supply Chain Management: strategies for reducing costs and improving services*. Pitman, London

Christopher, M., Peck, H. (2004). Building the resilient supply chain. *International Journal of Logistics Management*, 15(2), 1-14.

Cox, A. (2001). Managing with power: strategies for improving value appropriation from supply relationships. *Journal of Supply Chain Management*, 37(1), 42-47.

Fawcett, S. E., Magnan, G. M., McCarter, M. W. (2008). Benefits, barriers, and bridges to effective supply chain management. *Supply Chain Management: An International Journal*, 13(1), 35-48.

Forrest, J. E., Martin, M. J. (1990). Strategic alliances: lessons from the new biotechnology industry. *Engineering Management Journal*, 2(1), 13-21.

Gunasekaran, A., Kobu, B. (2007). Performance measures and metrics in logistics and supply chain management: a review of recent literature (1995–2004) for research and applications. *International Journal of Production Research*, 45(12), 2819-2840.

Handfield, R. B., Krause, D. R., Scannell, T. V., Monczka, R. M. (2006). Avoid the pitfalls in supplier development. *MIT Sloan Management Review*, 47(2), 37-49.

Higgins, J. P. T., Green, S. (2011). Cochrane Handbook for Systematic Reviews of Interventions. Available at: <http://handbook.cochrane.org/> (accessed date February 1, 2015)

Holweg, M., Disney, S., Holmström, J., Småros, J. (2005). Supply Chain Collaboration:: Making Sense of the Strategy Continuum. *European Management Journal*, 23(2), 170-181.

Horvath, L. (2001). Collaboration: the key to value creation in supply chain management. *Supply Chain Management: An International Journal*, 6(5), 205-207.

Hoyt, J., Huq, F. (2000). From arms-length to collaborative relationships in the supply chain: an evolutionary process. *International Journal of Physical Distribution & Logistics Management*, 30(9), 750-764.

Kampstra, R. P., Ashayeri, J., Gattorna, J. L. (2006). Realities of supply chain collaboration. *International Journal of Logistics Management*, 17(3), 312-330.

Matopoulos, A., Vlachopoulou, M., Manthou, V., Manos, B. (2007). A conceptual framework for supply chain collaboration: empirical evidence from the agri-food industry. *Supply Chain Management: An International Journal*, 12(3), 177-186.

McLaren, T., Head, M., Yuan, Y. (2002). Supply chain collaboration alternatives: understanding the expected costs and benefits. *Internet Research*, 12(4), 348-364.

Miles, M. B., Huberman, A. M. (1994). *Qualitative data analysis: an expanded sourcebook*. Sage Publications, 2nd Ed.

Monczka, R. M., Petersen, K. J., Handfield, R. B., Ragatz, G. L. (1998). Success Factors in Strategic Supplier Alliances: The Buying Company Perspective. *Decision Sciences*, 29(3), 553-577.

Muckstadt, J. A., Murray, D. H., Rappold, J. A., Collins, D. E. (2001). Guidelines for collaborative supply chain system design and operation. *Information Systems Frontiers*, 3(4), 427-453.

Myhr, N., Spekman, R. E. (2005). Collaborative supply-chain partnerships built upon trust and electronically mediated exchange. *Journal of Business & Industrial Marketing*, 20(4/5), 179-186.

Power, D. (2005). Supply chain management integration and implementation: a literature review. *International Journal of Supply Chain Management: An International Journal*, 10(4), 252-263.

Pramatari, K. (2007). Collaborative supply chain practices and evolving technological approaches. *Supply Chain Management: An International Journal*, 12(3), 210-220.

Sabath, R. E., Fontanella, J. (2002). The unfulfilled promise of supply chain collaboration. *Supply Chain Management Review*, 6(4), 24-29.

Sahay, B. S. (2003). Supply chain collaboration: the key to value creation. *Work Study*, 52(2), 76-83.

Serapio, M. G., Cascio, W. F. (1996). End-games in international alliances. *The Academy of Management Executive*, 10(1), 62-73.

Simatupang, T. M., Sridharan, R. (2002). The collaborative supply chain. *International Journal of Logistics Management*, 13(1), 15-30.

Skjoett-Larsen, T., Thernøe, C., Andresen, C. (2003). Supply chain collaboration: theoretical perspectives and empirical evidence. *International Journal of Physical Distribution & Logistics Management*, 33(6), 531-549.

Soosay, C. A., Hyland, P. W., Ferrer, M. (2008). Supply chain collaboration: capabilities for continuous innovation. *Supply Chain Management: An International Journal*, 13(2), 160-169.

Spekman, R. E., Kamauff Jr, J. W., Myhr, N. (1998). An empirical investigation into supply chain management: a perspective on partnerships. *Supply Chain Management: An International Journal*, 3(2), 53-67.

Stank, T. P., Keller, S. B., Daugherty, P. J. (2001). Supply chain collaboration and logistical service performance. *Journal of Business Logistics*, 22(1), 29-48.

Strauss, A., Corbin, J. (1998). *Basics of qualitative research: techniques and procedures for developing grounded theory*. Sage: Thousand Oaks, CA. 2nd Ed.

Turnbull, P., Oliver, N., Wilkinson, B. (1992). Buyer-supplier relations in the UK-automotive industry: Strategic implications of the Japanese manufacturing model. *Strategic Management Journal*, 13(2), 159-168.

Vereecke, A., Muylle, S. (2006). Performance improvement through supply chain collaboration in Europe. *International Journal of Operations & Production Management*, 26(11), 1176-1198.

Welty, B., Becerra-Fernandez, I. (2001). Managing trust and commitment in collaborative supply chain relationships. *Communications of the ACM*, 44(6), 67-73.

Whipple, J. M., Russell, D. (2007). Building supply chain collaboration: a typology of collaborative approaches. *International Journal of Logistics Management*, 18(2), 174-196.