

SUPPLY CHAIN COLLABORATION (SCC) – A PILOT STUDY OF SMALL AND MEDIUM ENTERPRISES (SMES) IN DANANG



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ABSTRACT

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Supply Chain Collaboration (SCC) is still a new definition in Vietnam, where a small number of enterprises formed or participated in supply chains. This leads to the need of a distinct study, depict the real situation of supply chain and especially SCC in Vietnam. The purpose of this study is to examine the feasibility of a collaboration index based on previous findings, and give the pre-estimation of the level of collaboration in present supply chain. We propose and preliminary test the collaboration index, which fits Vietnam economy context, using data gathered from 46 local firms. The result will open up venues for further empirically researches as well as provide some clues to help firms in improving their supply chain performance in general, and SCC, in particular.

Contribution/ Originality: This study is one of very few studies which have investigated the main pillar of SCC and determined to measure the depth of collaboration relationship between supply chain partners, which in turns may help to improve the performance of the whole supply chain.

1. INTRODUCTION

In the 1980s, most of the company found out that strategy and manufacture techniques might enable them to cut down cost, and improve competitive advantages in different markets. Once just – in –time (JIT), kanban, lean manufacture and total quality management (TQM) have successfully been applied within the company, attention shifted toward the supply chain – as a next step to enhance market share and profit. Supply chain or supply network comprised of many participants incorporate in making product, including suppliers, manufacture, carriers, distributors, wholesaler and retailer. Within the bounds of the supply chain, these independent participants interact with each other through information, finance and product flow, and be in charge of one or a few work phrases such as manufacturing, marketing, distributing, supplying. These independent participants use their core competencies to make the final product that meet the demand of the end customer and maximize the total profit of the supply chain. Supply chain management is the work of giving optimal decisions about designing the supply chain, location planning, material and inventory management, purchasing, transporting and distributing. Nevertheless, before

deeply engaging in this complex relationship, participants should build and continuously maintain the collaborative relationships between them, due to the supply chain feature of a lot of participants, intricately context. Each feature pursues a different goal, with different strategy. It is clear that collaboration is the key to achieve supply chain management. Increasingly, firms are building collaborative relationships with their supply chain partners in order to achieve efficiencies, flexibility, and a competitive advantage (Nyaga *et al.*, 2010) by adopting a long-term approach with joint efforts by each partner create unique value that neither partner can create independently (Corsten and Kumar, 2005). Collaboration is vital for firms in supply chain (Su *et al.*, 2008) because of the fact that the ability to compete has been directly linked with their ability to collaborate with other enterprises. In contrast with the traditional business model, which focuses on internal processes, in modern perspective, SCC is much more necessary than an option (Togar and Ramaswami, 2005) it is an antecedent factor to build a successful supply chain.

The dynamic and multi-functional nature of supply chain results in often varied network partners with multiple relationships patterns, organizational culture and level of inter-connectedness (Chakraborty *et al.*, 2014). As a result, there have been many studies about the SCC, such as Togar and Ramaswami (2005); Kumar and Nath (2014); Simatpung (2006) who formed collaboration indexes, factors have significant impact on SCC of Hartmann (2009) and studies mentioned about the consequence of SCC on the performance of enterprises written by Betts and Tadisina (2009). These papers were almost conducted in developed countries, with enormous multinational enterprises and large, sustainable supply chains. In Vietnam, collaboration has not been a familiar definition, besides, most of the Vietnamese companies are small and medium-sized enterprises, and have not been engaging in a large and formal supply chain before. Therefore, it is not quite suitable to apply those findings in Vietnam. Also, there is a lack of reports about the level of collaboration in present supply chains as well as specific empirical paper focusing on constructing the collaboration index.

At present, just a small number of Vietnam enterprises, which have formed or participated in supply chains. To improve that figure, there is a need of distinct study, deep investigation to depict the real situation of supply chain and especially SCC in Vietnam. The purpose of this study is to examine the extent of collaboration in supply chain through the estimation of collaboration index based on previous findings, and analyze the level of collaboration in present supply chain. The result will help companies to know the depth of collaboration which in turn will help them improve collaboration through various dimensions highlighted in this study.

2. LITERATURE BACKGROUND

2.1. Supply Chain Management

Talking about Walmart, Unilever or Toyota, we cannot forget to mention their fantastic supply chains. Having many of the features associated with a 'fifth generation innovation' (Saad *et al.*, 2002) it is reasonable to consider supply chain as the outstanding competitive advantage, which has a considerable contribution to the success of these giant empires. The supply chain is defined as a business process, in which participants are all individuals or organizations, from end-user to original suppliers, providing products, services, and information, that add value for customers and other stakeholders (Rota *et al.*, 2012). These implicated relationship networks require a scientific management, known as supply chain management, which is the concept of systematic and strategic coordination of the traditional business functions within a particular company and across businesses within the supply chain, with the aim of improving the long-term performance of the individual companies and the supply chain as a whole (Vallet-Bellmunt *et al.*, 2011)

2.2. Supply Chain Collaboration

To achieve the paramount goal above, the organisations in a supply chain need to collaborate with each other, actually, SCC plays a crucial role in a complex manufacturing environment (Inaam *et al.*, 2016) which is simply defined by Rota *et al.* (2012) as organisation that works together and goes beyond normal B2B relationships, instead

of just executive its own business and pursuit its own business goals. Collaboration in context of supply chain is defined as a partnership process where two or more autonomous firms work closely to plan and execute supply chain operations toward common goals and mutual benefits (Cao and Zhang, 2011) by integrated solutions for lowering cost and increasing revenue (Hudnurkar *et al.*, 2014) greater profitability of satisfying end customer needs than acting alone (Anbanandam *et al.*, 2011) through sharing crucial information, benefits, and making joint decisions, by doing so chain participants can create a competitive advantage (Janvier-James and Didier, 2011). At the same time, Kohli and Jensen (2010) determined SCC as a win-win arrangement that is likely to provide improved business success for both parties. Based on collaborative paradigm, it can be envisioned that the supply network is a collection of interdependent relationships aimed at gaining mutual benefits and be considered as an antecedent to value co-creation by deriving benefits from each other's value propositions and competences (Chakraborty *et al.*, 2014).

From that definition, in the academic world, countless authors have spent time, conducted surveys to investigate what factors are considered as the pillars of SCC through theoretical studies as well as empirical researches to identify these in a bid to better practice collaboration in supply chain. Cao and Zhang (2011) defined SCC as seven interconnecting components: information sharing, goal congruence, decision synchronization, incentive alignment, resources sharing, collaborative communication, and joint knowledge creation. These seven dimensions are expected to be intercorrelated and covary with each other although there might be causal relationships among them. On the other hand, Kohli and Jensen (2010) consisted that the effectiveness of SCC is driven by information sharing, joint planning, goal congruence, personal interaction, and trust. However, the last two have no significant impact on this subject. Meanwhile, the attribute of collaboration was also identified by three important constructs; relationship interaction, behaviors, and culture. These revealed the characteristics of joint planning, shared information, joint performance measurement, joint problem solving, and leveraging resources and skills Janvier-James and Didier (2011). Matopoulos *et al.* (2007) supposed that trust, power, dependence, and risk/reward sharing are importance elements in establishing and maintaining supply chain relationships. From perspective of Simatupang and Sridharan (2005) collaborative supply chain framework is composed of five connecting features, which are collaboration (namely collaborative performance system), information sharing, decision synchronization, incentive alignment and integrated supply chain processes which are re-defined as collaborative practices in information sharing, decision synchronization and incentive alignment (Simatpung, 2006). Besides, these factors are also defined as collaboration culture, joint planning, joint problem-solving & performance measurement, and resource sharing. These factors are the four components of hierarchical collaborative model (Kumar and Nath, 2012) joint actions, sharing of logistic and commercial information, interpersonal collaboration, sharing of logistic costs and gains and strategic collaboration (Vieira *et al.*, 2009) strategies, shared goals, relational embeddedness, and inter-organizational trust on inter-organizational knowledge sharing and collaboration (Chen *et al.*, 2014).

It was evident that the integration of all these factors in studying the overall and operational effectiveness of the SCC context was lacking in the literature.

3. RESEARCH METHODOLOGY

In Vietnam economy context, SMEs accounts for a majority of enterprise, with a comparatively small size and limited managerial level, most of them have just focused on dealing with the internal issues, therefore supply chain management is still an unfamiliar definition to them. This causes a lot of difficulties in investigation and data-gathering processes. Whether the managers of these SMEs are accustomed to SCC concepts? Whether they are enabled in understanding the survey? Whether the international index is suitable to be used as a measurement in Vietnam context? To figure out the answers, we decided to use quantitative pilot study to verify the suitability of the index used with Danang SMEs.

3.1. Pilot Study

Despite the extensive levels of planning involved in the design of a study, experience shows that unforeseen problems can and typically will arise during the conduct of a study that must be handled with care. This is the reason why we decided to handle a pilot study (Viechtbauer *et al.*, 2015) which was defined as a small-scale study. We used a specific pre-testing of a particular research instrument such as a questionnaire or interview schedule (Van Teijlingen and Hundley, 2001) that helps to examine the practicality and feasibility of the methods to be used in a subsequent larger and more comprehensive investigation, in form of a standard scientific tool for 'soft' research, preliminary analysis before committing to a full-blown study or experiment (Viechtbauer *et al.*, 2015).

Conducting a pilot study does not guarantee success in the main study, but it does increase the likelihood. Furthermore, it fulfills a range of important functions, such as provide valuable insights for other researchers, assess the feasibility and workability of research protocol (Van Teijlingen and Hundley, 2001) provide an excellent opportunity to uncover such problems ahead of time, as well as minimizing the need to adopt procedures or to develop contingency plans on short notice when the larger study is being conducted (Viechtbauer *et al.*, 2015).

3.2. Measures

Taking a broader snapshot of the literature, through information synthesis, an instrument to measure SCC was conceptualized using seven dimensions, namely information sharing, goal congruence, decision congruence, incentive alignment, resource sharing, collaborative communication and joint knowledge creation.

Information sharing (include the attitude toward information sharing and specific actions) is a basic form of collaboration. Sharing private data among collaborative partners is necessary to make an efficient supply chain. Especially, market-based information sharing, the reflecting of customers' fast changing tastes are valuable assets which enable firms to quickly identify customer requirement and attend their needs and wants (Kumar and Nath, 2012). Information sharing refers to the extent to which a firm shares a variety of reliability (Simatupang and Sridharan, 2005) relevant, accurate, complete, and confidential information in a timely manner with its supply chain partners (Cao and Zhang, 2011) that is necessary for the creation of value (value-in-use) (Chakraborty *et al.*, 2014). When repeated through exchanges over time, information sharing inner supply chain would result in desirable outcomes of the relationship and good communication solidifies trust (Jeong and Oh, 2017)

Goal congruence between supply chain partners is the extent to which supply chain partners perceive their own objectives which are satisfied by accomplishing the supply chain objectives. It is the degree of goal agreement among supply chain partners. In the case of true goal congruence, supply chain partners either feel that their objectives fully coincide with those of the supply chain, or, in case of disparity, believe that their goals can be achieved as a direct result of working toward the objectives of the supply chain (Cao and Zhang, 2011). The goal conflict may have a ruinous on the performance of the whole chain, as the fact that each party gives its best shot to maximize their own benefits; as a result, it is important to have in place a measurement system that can capture the benefits of collaboration (Janvier-James and Didier, 2011).

Decision congruence Ramanathan and Gunasekaran (2014) supported the hypothesis that collaborative planning, execution and decision-making have positive effect on the success of collaboration. Joint decisions may include material requirement, purchasing, budgeting (Kumar and Nath, 2014) sales and order forecasts, inventory, replenishment, order placement, order delivery, customer service level, and pricing. The interaction of decision synchronization with other features of the framework is very important as it enables the chain members to orchestrate their decisions that contribute to the achievement of overall performance (Simatupang and Sridharan, 2005; Leat and Revoredo-Giha, 2008). The earlier the suppliers are involved in the product/process design and quality planning, the more quickly, and efficiently they can identify buyers' need effectively, and create a harmonious atmosphere, reduce the limitation of investment specialization and avoid being at a disadvantageous position in cooperation (Su *et al.*, 2008).

Incentive alignment motivates the members to act in a manner consistent with their mutual strategic objectives, including making decisions that are optimal for the overall supply chain and revealing truthful private information. It covers the calculations of costs, risks, and benefits as well as the formulations of incentive schemes such as pay-for-performance and pay-for-effort. Incentive alignment can be viewed as an enabler that motivates the chain members to reinforce the attainment of overall performance targets (Simatupang and Sridharan, 2005).

Resource sharing include the act of sharing capabilities and assets and investing in capabilities and assets with supply chain partners (Cao and Zhang, 2011)

Collaborative communication is the contact and message transmission process among supply chain partners in terms of frequency, direction, mode, and influence strategy (Cao and Zhang, 2011).

Joint knowledge creation refers to the extent to which supply chain partners develop a better understanding of and response to the market and competitive environment by working together (Cao and Zhang, 2011).

3.3. Data Gathering – Participants in the Pilot Study

Enterprise related data gathering is always a pressing problem, so that we determined to call the help of college students and master students as interviewers. At present, University of Danang – university of economic has almost 600 graduate students, whose major are business administration, accountancy, banking, economic management and economic development. Among these graduate students, we only chose samplers who are working at SMEs, holding at least the position of junior manager and the like. After the selection process, 130 students fulfilled our criteria.

These collaborators then were invited to a SCC workshop, which presented a number of fundamental definitions of supply chain, supply chain partners, collaboration in the context of supply chain, the brief purpose of the research and some requirement need abide thorough the data gathering process. After that, interviewers were provided a survey (as Appendix 1), for each question, the informants were required to give a short answer (about 5 - 10 lines in length) describing the collaboration state of his/ her company. In one week, these interviewers would collect relevant information and update it on an online database. As a result, we collected 95 responses. However, among these collected responses there were incompleting responses. After eliminating these responses, we gained 46 valid responses.

3.4. Data – Analyzing

Because of the responses were qualitative data, the data – analyzing process took a lot of time to be completed. At first, we went through all responses to have a preliminary view about the content of them, then eliminated the off-topic or irrelevant answer and imagined some keywords that we might come across. For example, with the question coding At1 “Our firm and supply chain partners exchange timely information”, we paid attention to adverbs of frequency such as: always, often, sometimes, seldom, never... (as Appendix 1). After that, we carefully read all responses of each question one by one to and and collect those keywords, as mentioned above, which are relevant to the question to group them into similar category. After having the number of occurrences of each group, we summarized the result in to a two or three-line-in-length passage, which can generally capture the result. In addition to this, we also made it be more precise by providing the detail percentage along with each group of similar responses.

4. RESULT

Overall, among 46 information providing companies, trading companies occupy a significantly high proportion, a 50%, the figure for manufacturing and service company are 40% and 8%, respectively. Finally, firms which are in the agriculture line of business are just 2 out of 46. As the initial requirements of the research, all informants are holding high positions (76%) or operation staff, such as sale or purchasing staff, to name but a few.

Table-1. Overview the participants in the pilot study.

Line of business	Quantity
Service	4
Agriculture	2
Manufacturing	17
Trading	23
<i>Total</i>	46
Role in the company	Quantity
Board of directors	15
Head of sale, purchasing, manufacturing... department	15
Manufacturing manager	10
Sale, purchasing staff	6
<i>Total</i>	46

Source: Overview the participants in the pilot study analyzed from the survey result

4.1. Information Sharing

The level of sharing information between supply chain participants depend on the degree to with the information is directly relevant to partners operation and the strategic importance of a specific partner. However, majority of enterprises, which account for 81%, shared relevant new information, which including confidential information (64%), with their partners. The shared information is often delivery quantity, quality and schedule (100%), pricing policy – price adjustment related information (96%), end-customers feedbacks on product or service (83%), demand forecast (74%), product promotions (64%). However, the information on POS data (56%) and manufacture planning (96%) are almost keep confidential, believed that some information is their asset, and by sharing this can cause a detrimental effect on their business.

Most of the MSEs share and exchange related information immediately (81%), accurately (64%), and completely (51%), as soon as it arises, using email or telephone. Just a small number of enterprises, which are large sized companies or a branch of a multination corporations have their own information inter – exchange systems.

4.2. Goal Congruence

All firms have no idea about the goal of their supply chain, however, these firms still share their goal with their direct suppliers and their partners in downstream, which take 62%, but still cannot reach congruence in term of goal. Most of them just value their own goals, and take actions for the purpose of achieving their individual ones. This may due to the fact that 95% is the figure for informants who believe that they cannot attain the business target through the joint goal achievement. Similarity, 57% of firms completely do not cooperate in layout collaboration implementation plans to achieve the shared goal, just 30% firms do well in this aspect; and the other 4% firms would decide whether they should cooperate or not, depending on the kind and the strategic importance of a specific partner.

4.3. Decision Congruence

To maximize the benefits received from supply chain, many firms cooperate with their partners in many faces, such as jointly planning on promotional events (53%), to be more precise, these collaborations often occur between the manufacture and their downstreams, and just be limited in term of running promotional events, not planning. At the same time, most firms cooperate well in jointly developing new products by providing market or demand information as well as propose new, creative idea (53%); additionally, there is a great percentage of firms also jointly working out solutions and tackling conflicts, which are 91% and 85%, respectively.

On the other hand, these firms have not been good at collaborating in some sides of decision making, such as demand forecasting, material requirement, purchasing, budgeting and pricing, managing inventory. Because of the thought that these activities are internal functions of a business entity, especially product assortment and pricing, which is considered as the exclusive decisions of the manufacturer only. In term of managing inventory, 43% of

firms have collaborated with their downstream partners in periodic inventory management, in form of formal informs. None of these firms collaborate with their upstream partners in inventory control. In term of product assortment, all MTO companies have collaborated with their counterparts in deciding product assortment, whereas in contrast, most MTS companies just base on market information exchanged among partners to decide what kind of product would be manufactured, which means these partners are just considered as the member of a reference group rather than a key marker of product assortment.

4.4. Incentive Alignment

On the whole, mainly local firms and their supply chain partners (70%) share benefits, risks that can occur in transporting or product storage, as well as some costs such as delivery cost, market development cost (45%) but not the holding inventory cost, which accounts for 53%. These level of benefits/ risks are well defined through the negotiating stage of contract. All risks that occur above the limit of the commercial contract would not be included, and do not require any coordinated actions.

In term of general evaluation systems, most of the firms (51%) still have not collaborated with their partners to develop and keep track of each other's performance. Just 32% enterprises supposed that their partners and themselves have collaborated in built up a shared evaluation systems, which mainly based on sale, market coverage or product display.

4.5. Resource Sharing

Many firms share, or use cross-organizational teams frequently back their downstream partners up in design and complete the working process (selling, inventory managing process...). Similarity, these firms (49%) also provide both financial or non-financial resources such as sharing technical supports and pieces of equipment, enable credit buying or provide loan for investment use. However, personal dedication to manage collaborative processes is the only aspect displays as a considerate higher proportion, of 70%.

4.6. Collaborative Communication

Most firms (97%) frequently contact on a regular basis with their counterpart to exchange relevant information such as ordering information, quality, quantity of the product, the inventory level or customer feedbacks by using multi-channel, direct or indirect methods, like face-to-face meeting, mail, fax, video conference. For most of firms, these communications open two-way exchange, which accounts for 76%, and 15% of firms open two-way level of communication which is varied depended on situation, or partner. Among the shared information, 56% is formal information. These firms are quite reserved in sharing informal information (price shrinking, change in state policies or future development orientations, etc.), just 35% of firms share this kind of information, and 4% of firms just share in some specific situations. Besides, most of firms (91%) influence each other's decisions in a positive constructive way through discussion.

4.7. Joint Knowledge Creation

Most of firms still have limited achievement on collaboration with their partners, neglect jointly searching and acquiring new and relevant knowledge, 54% and 52%, respectively. Noticeably, most of the knowledge jointly created is new knowledge relate to material or information technology. The result shows a significantly high incidence of firms which jointly identify customer demand, which is 60%; however, there are no positive figures for the number of firms discovering new or emerging markets, and learning the intentions and capabilities of competitors. 65% and 74% are the percentages of firms, which completely do not have any collaboration with their supply chain partners in the two aspects mentioned above, respectively.

5. CONCLUSION

The work presented in this paper has proved the feasibility and workable of applying an international protocol in researching a newly concept- SCC in Vietnam. In addition to this, the finding has also revealed the preliminary measurement of collaboration between partner within the supply chain – which is believed quite loose. Besides, this study makes a significant contribution to the supply chain management and SCC literature by system- synthesize the previous findings, and provide guidelines to further research about SCC in Vietnam, especially among SMEs as well as some clues about improving supply chain performance in general, and SCC, in particular.

Despite having considerable contributions, there are several limitations. First, the interviewers in this research might have limited understanding about the idea expressing or investigation skills, so that they were unable to fully, correctly gain value information. Secondly, the informants might do not entirely familiar with some SCC definitions. These difficulties cause some misunderstanding answers, which shrank the collected database of the research.

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Appendix-1. Instruments and Citations

Factor		Coding	Dimensions/items Incentive	Citations	Keywords
Information sharing	Attitude	At1	Our firm and supply chain partners exchange timely information	(Cao and Zhang, 2011)□	Always, often, sometime, never, relevant, strategic, phone, email, intra-enterprise information system.
		At2	Our firm and supply chain partners exchange accurate information	(Cao and Zhang, 2011)□	Accurate, fairly accurate, inaccurate.
		At3	Our firm and supply chain partners exchange complete information	(Cao and Zhang, 2011)□	Complete, fairly complete, depend on situation, incomplete.
		At4	Our firm and supply chain partners exchange confidential information	(Cao and Zhang, 2011)□	Yes, no, depend on situation, strategic partner, relevant, important information.
	Actions	Ac1	Our firm and supply chain partners share POS data and manufacturing planning	(Kumar and Nath, 2014; Kumar <i>et al.</i> , 2017)□	POS data, manufacturing planning, share completely, accurately, fairly accurately, confidential, asset.
		Ac2	Our firm and supply chain partners share delivery schedule	(Simatpung, 2006; Kumar and Nath, 2014; Kumar <i>et al.</i> , 2017)□	Delivery schedule, delivery quantity, means of delivery definitely, required information
		Ac3	Our firm and supply chain partners share end customers feedbacks on products and services	(Kumar and Nath, 2014; Kumar <i>et al.</i> , 2017)□	Partly, relevant feedback, positive feedback, detrimental feedback, keep it confidential.
		Ac4	Our firm and supply chain partners share information about product promotions	(Simatpung, 2006; Kumar <i>et al.</i> , 2017)□	Promotion policy, discount rate, distributor partners, downstream partner, definitely, always.
		Ac5	Our firm and supply chain partners share information about demand forecast	(Simatpung, 2006; Kumar and Nath, 2014; Kumar <i>et al.</i> , 2017)□	In advance, confidential information, depend on partner.
		Ac6	Our firm and supply chain partners share information about pricing policy	(Simatpung, 2006; Kumar <i>et al.</i> , 2017)	In advance, definitely, depend on partner.
Goal congruence		O1	Our firm and supply chain partners have agreement on the goals of the supply chain	(Cao and Zhang, 2011)□	Goal congruence with the whole chain, only some strategic, downstream partner, in some aspect, pursuit

					individual goal, do not know supply chain goal.
		O2	Our firm and supply chain partners have agreement on the importance of collaboration across the supply chain	(Cao and Zhang, 2011)□	Definitely, depend on partner, disagreement.
		O3	Our firm and supply chain partners have agreement on the importance of improvements that benefit the supply chain as a whole	(Cao and Zhang, 2011)□	Definitely, depend on partner, disagreement
		O4	Our firm and supply chain partners agree that our own goals can be achieved through working toward the goals of the supply chain	(Cao and Zhang, 2011)□	Definitely agree, disagree, depend on partner.
		O5	Our firm and supply chain partners jointly layout collaboration implementation plans to achieve the goals of the supply chain	(Cao and Zhang, 2011)□	Fully achieve, partly achieve, can not achieve, only true for the focal or bis enterprise in chain.
Decision congruence		P1	Our firm and supply chain partners jointly plan on promotional events	(Simatpung, 2006; Cao and Zhang, 2011; Kumar and Nath, 2014; Kumar <i>et al.</i> , 2017)□	Jointly planning, Budget, promotion policy, depend on promotion program, independently planning, downstreams, promotions running.
		P2	Our firm and supply chain partners jointly develop demand forecasts	(Simatpung, 2006; Kumar and Nath, 2014)□	Jointly planning, depend on partner, independently planning, market demand information, proposal,
		P3	Our firm and supply chain partners jointly manage inventory	(Simatpung, 2006; Kumar and Nath, 2014)□	Jointly manage, independently manage
		P4	Our firm and supply chain partners jointly plan on product assortment	(Cao and Zhang, 2011)	Jointly planning, act as a references, depend only on firm production strategic.
		P5	Our firm and supply chain partners jointly develop new products	(Simatpung, 2006)□	Jointly development, technology, raw material, component, depend on partner., MTO, MTS
		P6	Our firm and supply chain partners jointly	(Kumar and Nath, 2014)□	Jointly solve, depend on situation,

			work out solutions		selfly manage by firm.
		P7	Our firm and supply chain partners jointly plan for material requirement	(Simatpung, 2006; Cao and Zhang, 2011; Kumar and Nath, 2014) (Simatpung, 2006)□	Jointly planning, depend on partner, selfly planning.
		P8	Our firm and supply chain partners jointly plan in purchasing	(Kumar and Nath, 2014)□	Jointly planning, depend on partner and situation, selfly planning.
		P9	Our firm and supply chain partners jointly plan in budgeting	(Kumar and Nath, 2014)	Jointly planning, depend on partner and situation, selfly planning.
		P10	Our firm and supply chain partners jointly plan in pricing	(Kumar and Nath, 2014)□	Jointly planning, depend on partner and situation, selfly planning.
		P11	Our firm and supply chain partners jointly tackle conflicts	(Simatpung, 2006; Kumar and Nath, 2014)	Jointly planning, depend on partner and situation, selfly planning.
Incentive alignment		C1	Our firm and supply chain partners co-develop systems to evaluate and publicize each other's performance	(Simatpung, 2006)	Co-develop, self evaluate.
		C2	Our firm and supply chain partners share costs	(Kumar and Nath, 2014)	Share, delivery cost, promotion cost, market development cost, risk, do not share.
		C3	Our firm and supply chain partners share holding inventory cost	(Kumar and Nath, 2014)□	Yes, depend on partner, no.
		C4	Our firm and supply chain partners share benefits	(Kumar and Nath, 2014)	Yes, as negotiation in the contract, no.
		C5	Our firm and supply chain partners share any risks that can occur in the supply chain	(Simatpung, 2006; Kumar and Nath, 2014)□	Yes, depend on situation (transporting, storage), no.
Resource sharing		S1	Our firm and supply chain partners use cross-organizational teams frequently for process design and improvement	(Cao and Zhang, 2011)□	Use, do not use, downstreams
		S2	Our firm and supply chain partners dedicate personnel to manage the collaborative processes	(Simatpung, 2006; Cao and Zhang, 2011; Kumar and Nath, 2014)□	Permanent personem, seasonal employee, no.
		S3	Our firm and supply chain partners share technical supports	(Cao and Zhang, 2011)□	Yes, no, depend on situation.
		S4	Our firm and supply chain partners share	(Cao and Zhang, 2011)	Yes, completely no, POS materials.

			equipments		
		S5	Our firm and supply chain partners pool financial and non-financial resources	(Cao and Zhang, 2011)□	Financial, non – financial, time, capital, training programs, means of delivery.
Collaborative communication		Com1	Our firm and supply chain partners have frequent contacts on a regular basis	(Kumar and Nath, 2014)	Daily, often, weekly sometime, seldom.
		Com2	Our firm and supply chain partners have open and two-way communication	(Cao and Zhang, 2011)□	Definitely yes, depend on partne, relevant information, inventory level, customer feedback.
		Com3	Our firm and supply chain partners have informal communication	(Cao and Zhang, 2011)□	Formal, informal, depend on situation.
		Com4	Our firm and supply chain partners have many different channels to communicate	(Cao and Zhang, 2011; Kumar and Nath, 2014)	Telephone, fax, email, social networks, intra-firm information system, communication apps, meet in person...
		Com5	Our firm and supply chain partners influence each other's decisions through discussion	(Kumar and Nath, 2014)□	Constructive, discussion, negotiation, destructive.
Joint knowledge creation		K1	Our firm and supply chain partners jointly search and acquire new and relevant knowledge	(Cao and Zhang, 2011)□	Yes, only in some aspects, no.
		K2	Our firm and supply chain partners jointly assimilate and apply relevant knowledge	(Cao and Zhang, 2011)□	Yes, material and technology relevant information, depend on partner, no.
		K3	Our firm and supply chain partners jointly identify customer needs	(Cao and Zhang, 2011)□	Yes, depend on partner, selfly identify.
		K4	Our firm and supply chain partners jointly discover new or emerging markets	(Cao and Zhang, 2011; Kumar and Nath, 2014)□	Yes, no, depend on partner.
		K5	Our firm and supply chain partners jointly learn the intentions and capabilities of our competitors	(Cao and Zhang, 2011)□	Yes, no, depend on partner or competitor.

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