

THE INFLUENCE OF THE SUPPLY NETWORK IN THE COLLABORATIVE PRODUCT DEVELOPMENT PROCESS: A THEORETICAL APPROACH

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1 INTRODUCTION

Researchers have given greater attention to the effects of the relationships between companies and their suppliers, arguing that companies that establish a collaborative relationship with their suppliers have a competitive advantage (AZADEGA et al., 2008; KIM, HUH, 2015; KIM, 2009; KOUFTEROS; VICKERY; DROGE, 2012; KRAUSE, HANDFIELD, TYLER, 2007). This advantage may be even more relevant among those companies that integrate their suppliers in their Supply Networks with the objective of developing innovative tasks with their preferred partners (KIM, 2016). Collaboration between companies arises therefore as a competitive response as to share risks and costs, but mainly benefits as time to go-to-market and research & development costs, plus additional benefits such as increased market share and knowledge exchange (BÜYÜKÖZKAN; ARSENYAN, 2012; YEH; PAI; YANG, 2009). Collaboration and integration with suppliers occur for several reasons: for speeding up purchase, production and delivery processes; to increase agility in organizational and financial operations; for the development of power; for the development of information systems and e-business; for the creation and transfer of knowledge, risk sharing, and for innovation and product development (KAMAL and IRANI, 2014).

About the development of new products, more and more the Partnerships in the Supply Network (SN) have used strategies of organizational connections which facilitate the cooperative development (JEAN; SINKOVICS; HIEBAUM, 2014; WANG LI; CHANG, 2016). Co-development of products or Collaborative Product Development (CPD) appear as examples of these strategies, and in which value creation takes place, innovation and process improvement among companies in collaboration, important for the outcome of the process (BÜYÜKÖZKAN; ARSENYAN, 2012, JEAN, SINKOVICS, HIEBAUM, 2014, WANG, LI, CHANG, 2016). In Supply Networks as well as in Collaborative Products Development, there are several factors that influence their success, as the selection of partners, knowledge sharing and the process of shared decision-making. These factors separately can reveal how you can improve the performance of the Supply Network and Collaborative Product Development (WANG LI; CHANG, 2016 ARSENYAN; BÜYÜKÖZKAN, 2014), however, not much is found in the literature about a simultaneous approach related to these success factors in Supply Networks in the Collaborative Product Development Process, indicating a possibility of research on the topic. Based on these arguments, the following research question arises: What are the factors that influence the Supply Chain in the Collaborative Product Development Process? Thus, these article aims to present a theoretical model that can be used to improve the performance of the Supply Chain in the context of the Collaborative Product Development Process. The theoretical model considers simultaneously and in an integrated manner a set of critical success factors. Therefore, it was carried out a literature review and the subsequent formulation of theoretical propositions for the suggested model.

This paper is structured as follows: in the section 2 is presented the theoretical basis used in the elaboration of propositions; in section 3 the methodology is described; in section 4, results and discussion; in section 5, conclusion.

2 THEORETICAL FOUNDATION

2.1 SUPPLY NETWORKS

Supply Networks (*Supply Networks* - SN) can be classified as a type of interorganizational network, which main objective is the acquisition, use and transformation of resources to provide goods and services (CARTER; ROGERS; CHOI, 2015; HARLAND et al., 2002; LAMMING et al., 2000). But it has not been always like this; the concept of Supply Networks emerged in the late 1990, as an evolution, something more complex than the concept of Supply Chain (HARLAND et al., 2002). Meanwhile, the term Supply Chain Management (SCM) came through consultancies in the decade of 80 (OLIVER; WEBBER, 1982) and focused on something more linear, as one-way flow of materials and information, in a more logistic and less strategic perspective (HARLAND et al., 2002), in which the flows of products and services are synchronized in all other internal areas of the company (such as marketing, IT, finance, operations) and this also includes clients and suppliers (BALLOU; GILBERT; MUKHERJEE, 2000).

The fact is that Supply Chain was a widely studied theme, but from Lambert and Cooper (2000), there is clear distinction between Chains and Supply Networks, concepts that were later endorsed by more recent studies (BRAZIOTIS et al., 2013). In this way, it can be affirmed that Supply Chain is the integrated system through which all the activities associated with the transformation and flow of goods and services, including their flows of information, are related from the sources of raw materials and direction to end users (BALLOU; GILBERT; MUKHERJEE, 2000).

Following a global view of logistics processes and supply chain, prevails itself since the early 2000s the era of Supply Networks, which has emerged as an important concept due to the increased structural complexity, the interconnected relationships between members of the chain and the substantial work generated to researchers in the area (BRAZIOTIS et al., 2013), who understand that chains are structures inserted within the broader context of these networks (LAMBERT and COOPER, 2000).

And since these were concepts that were further developed from the years 2000 onwards, it was not long before new theories and conceptual models that analyzed the activities of the Supply Networks, including more intangible aspects such as the relationships between the members of the chain (HARLAND et al., 2004). Inspired by studies of the decade of 1990 of strategic networks models, researchers sought to understand what processes, tools and techniques were best suited to inter-organizational networks and conducted many studies on the dyad between customers and suppliers, until they noticed the influence of third parties that process aspects such as communication, negotiation, decision-making routines, roles, procedures, problem solving, among others. The study explored this understanding mainly in two strands: strategy and structure of supply chains and networks, leaving aside the questions of the operational model as a resource to leverage the value potential of a supply network (HARLAND et al., 2004).

Harland et al. (2002) proposed a taxonomy for the analysis of the supply networks which is moved in a subsequent study (HARLAND et al., 2004) proposed a conceptual model of analysis of factors which facilitate and restrict the creation and supply networks operation (Figure 1), in which, from an exploratory study, the authors were able to identify four different types of contextual factors: Market; Presentation of the Product or Service and Process; Supply Chain Structure and Supply Chain Strategy. And nine different types of constraint and influence variables in the creation and operation of a Supply Chain: Partner Selection, Resource Integration; Information Processing; Knowledge Capture; Social Coordination; Shared Risks and Benefits; Decision Making; Conflict Resolution and Motivation (Figure 1). In developing

this conceptual model, Harland et al. (2004) examined specific situations in Supply Networks and opted to explore how the Supply Network was created, how the product was manufactured and produced, and finally how the Supply Network was operated. The authors point out that the variable Selection of Partners is only appropriate when the Supply Network is being created or recreated and all other variables are present in both situations, creation or operation of Supply Networks. This model was selected for this study by providing a strong framework of influencing factors for network supplies.

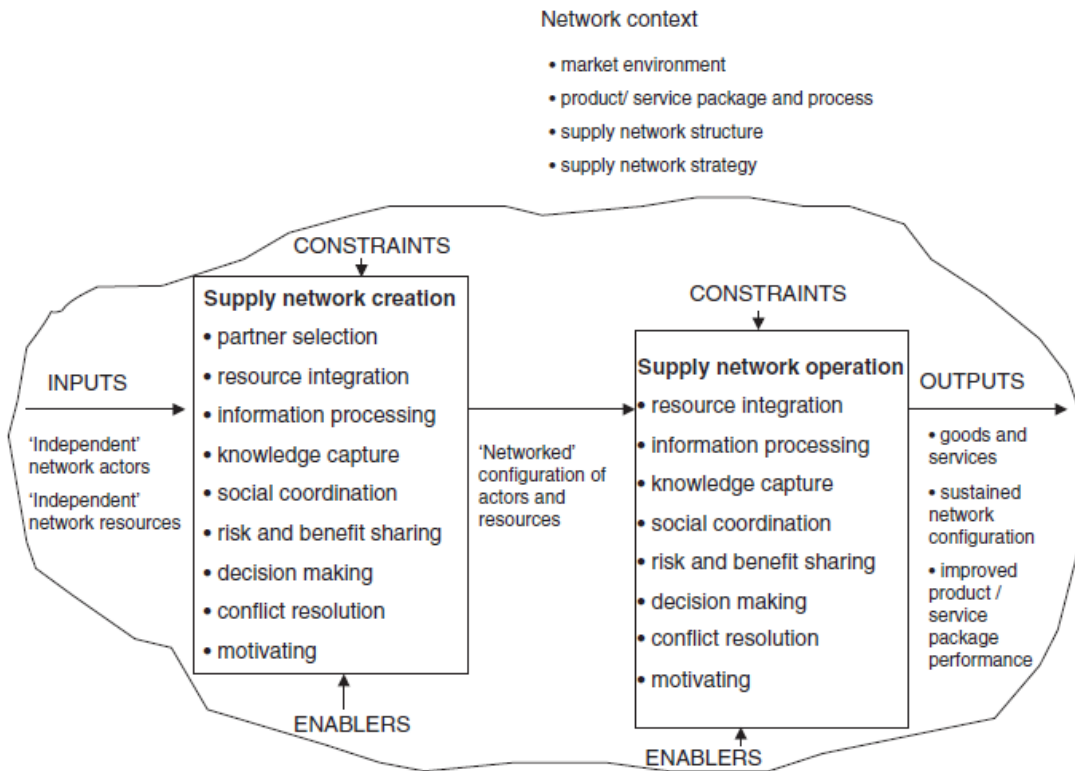


Figure 1 - Conceptual model (HARLAND et al., 2004).

2.1.1 Selection of Partners and Integration of Resources in Supply Networks

The selection of partners is considered a central activity in the creation of a Supply Chain (HARLAND et al., 2004; WU; BARNES, 2014). The term was used to refer not only to the individual selection of suppliers to be involved in a specific project of a product/service but also to define the structure strategy of which the Supply Network wishes to have, whether multiple or unique suppliers (HARLAND et al., 2004). Even in the 1990s, the literature has indicated that the purchasing function in the Supply Network would have a more strategic role, focusing on a few highly qualified partners with decentralized controls, aimed at long-term plans, making this task in the most qualified and professional Supply Network (COUSINS, 2002).

Many authors have devoted themselves to studying the Selection of Partners in Supply Networks and the literature has developed many classifications to analyze these relationships (HARLAND et al., 2004; WU; BARNES, 2014). Cousins (2002) relies on two dimensions, the level of certainty and the level of dependence, which results in four types of business relationships: traditional/adversarial, tactical collaboration, opportunistic behavior, and strategic collaboration. Other authors have been concerned with developing classification

models for the process of partner selection (WU; BARNES, 2014) with the purpose of generating a managerial contribution, besides the literary one.

These classifications demonstrate the importance of this step in the Supply Chain processes, allowing us to analyze the strength of the selection of partners, which ones to select, how many and what type of relationship is expected from each of them. After establishing their partners, companies organized in a Supply Network are often faced with the integration of resources among the members of the Network, which may involve physical resources, equipment and technologies, where suppliers can invest in equipment that is dedicated to a particular customer, just as the customer can be the financier of such equipment. This integration requires a human co-specialization of the companies' teams involved, with interactions among teams and cross-transfer between teams (HARLAND et al., 2004).

2.1.2 Learning and Information Exchange in Supply Networks

The shared inter-firm capturing is essential to the success of a Supply Network and depends not only on the focal company, but on the learning and development of the Network as a whole (MASON, OSHRI, LEEK, 2012). The exchange, and most importantly, the capture of knowledge (eg, processes, technologies or knowledge of the market), can be seen as a separate activity, focusing on innovation and long-term competitiveness for the Supply Network as a whole (HARLAND et al., 2004).

The "Organizational Learning" is recognized by imperative form since the 1990s (ARGYRIS, SCHON, 1996), a concept linked to innovation and the called "collective entrepreneurship", which its essence is the inter-organizational learning and innovation, also central concepts of lean supply (LAMMING, 1993), with emphasis on the importance of learning from suppliers. For learning to take place, the issue of information processing is inherent. The efficient and mutual exchange of information is also considered the heart of the lean supply concept (LAMMING, 1993). Lamming (1993) further emphasizes the importance of mutual exchange of information because, according to him, it leads to close cooperation and thus more efficient supply.

2.1.3 Decision Making, Shared Risks and Benefits in Supply Networks

Decision making in the Supply Network refers to the process of each choice in the Network, which can be a problem due to the wide dispersion of information and/or a lack of clear authority structure (HARLAND et al., 2004). The decision-making process in Supply Networks involves combining objectives and information, solving differences, establishing routines, rules and procedures, including contractual arrangements for sharing risks and benefits prior to the implementation of a collaborative agreement (KIM, 2016). The level of sharing of the decision-making process can be understood as an important element for the formation of the Supply Network as a way not only to build, but to maintain the partnerships established in the Network (HARLAND et al., 2004). The decision-making process at a network level is important because there are risks and shared benefits that are derived from the efforts of the members of the Network (GRANDORI, SODA, 1995). The nature of risk and shared benefit may vary according to the type of collaboration. In the case of partnerships and formal relationships, instruments such as contractual obligations, pay-as-you-result or ownership-control schemes can provide an important incentive for the parties to collaborate (GRANDORI; SODA, 1995; KIM, 2016).

The conceptual model of Harland et al. (2004) used in this study presents two other factors of influence in the creation and operation of Supply Networks: Conflict Resolution and

Motivation. Due to the social factors that allow for broad analyzes, they will not be approached in the present study.

2.2 COLLABORATIVE PRODUCT DEVELOPMENT

Collaborative Product Development can be defined when two or more partners share and complement resources and experiences mutually in a new product development project or improvements in existing products (BARNES; PASHBY; GIBBONS, 2006; BÜYÜKÖZKAN; ARSENYAN, 2012; DAVIS et al., 2004, KIM, 2016).

Recent studies have shed light on the importance of Collaborative Product Development and many researchers have discussed its application (BÜYÜKÖZKAN; ARSENYAN, 2012; DAVIS et al., 2004). In the high competitiveness market, companies are faced with demands for increasingly customized solutions, with high performance and quality in short time and budget spaces. To continue surviving, businesses must respond to these challenges with constant improvements in their products, processes and services (BÜYÜKÖZKAN; ARSENYAN, 2012; WANG; LI; CHANG, 2016). This dynamic allows us to analyze the innovation capacity that emerges as a process key to competitiveness and sustainability, which adds continuous pressure on teams of Research & Development (R&D) companies to produce a broad roadmap to develop new products or improvements, which considers managing all the risks associated with these processes from the beginning of the development to the launch of the product (BÜYÜKÖZKAN; ARSENYAN, 2012; OWENS; COOPER, 2001).

In this way, Collaborative Product Development (CPD) begins to gain not only greater importance in companies but also greater complexity, involving different areas of knowledge and expertise on markets and convergent technologies (CHAUDHURI; BOER, 2016; WANG; LI; CHANG, 2016). This complex scenario has led the R&D areas to work collaboratively to ensure both the best expertises (even geographically distant) and the time-to-market reduction (CHAPMAN; CORSO, 2005). Recent literature has shown that CPD and participation in collaborative development networks have been commonly used both to attribute value and benefits to those involved, including improving market survival, as well as the possibility of achieving common goals among participants (BÜYÜKÖZKAN; ARSENYAN, 2012).

On the other hand, the complexity of the CPD environment generates uncertainties about the efforts involved and despite all the motivations to join this form of network organization, the CPD process is difficult to manage and may not achieve its objectives (MARXT; LINK 2002). According to Marxt and Link (2002), less than 50% of CPD efforts are successful. This data stimulates studies to investigate the critical success factors in CPD. In this paper, Buyukozkan and Arsenyan (2012) proposed a model of analysis of the influence factors in the process of Collaborative Product Development (CPD), as shown in Figure 2. According to the Buyukozkan and Arsenyan (2012) model, CPD is composed of three fields of interactions that interact with each other, but each has its own dynamics: Processes of the Partnership, Processes of Collaboration, Processes of R&D. This model was selected because it best meets the conditions necessary for the study.

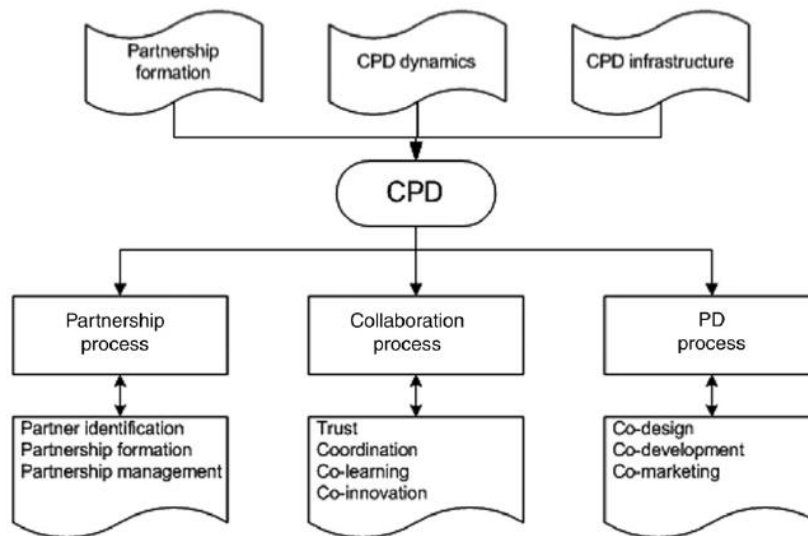


Figure 2 - Collaborative Product Development Model
Buyukozkan and Arsenyan, 2012.

2.2.1 Selection of Partners in Collaborative Product Development

Partner selection is a subgroup of collaborative product development (DCP) process studies, which is considered strategically important (BÜYÜKÖZKAN; ARSENYAN, 2012). Several studies have discussed the criteria that can define the selection of partners in DCP, for example, technological alignment with the project as well as the strategic and relational alignment of this partner with focal company (BÜYÜKÖZKAN; ARSENYAN, 2012; EMDEN; CALANTONE; DROGE, 2006). Having proximity to key actors, creative force and promote mutual knowledge (HIPKIN; NAUDÉ, 2006), as well as having knowledge of local markets and culture, with access to distribution channels and links with major customers (GLAISTER, BUCKLEY, 1997) are also mentioned as criteria for partner selection in CPD projects.

The selection of partners is also cited by other authors as an important criterion in the Collaborative Product Development Process (EMDEN; CALANTONE; DROGE, 2006; GLAISTER; BUCKLEY, 1997; HIPKIN; NAUDÉ, 2006; SHAH; SWAMINATHAN, 2008). Glaister and Buckley (1997) emphasize the importance of recognizing the mutual needs of partners and matching the appropriate partner. Shah and Swaminathan (2008) argue that partner selection goes beyond choice based on a list of skills and/or resources. The success of the Collaborative Product Development Process depends on how partners manage the governance of strategic objectives and their expertise (HIPKIN; NAUDÉ, 2006).

2.2.2 Learning and Information Exchange in Collaborative Product Development

Learning in the CPD is a universal factor for its success, considered something which its influence permeates all the elements and all stages of the life cycle of a collaborative project (BARNES; PASHBY; GIBBONS, 2006). Gaining knowledge, generating ideas, exchanging experiences and opportunities to reach a new market may be the major factors in the success of the Collaborative Product Development Process (MARXT; LINK, 2002).

In a learning phase, the task of CPD managers should be to reconfigure the value chain by changing structural and control mechanisms, and to learn what new information is needed, what knowledge to accumulate, and what management processes will facilitate these processes (HIPKIN and NAUDÉ, 2006). The capabilities of other partners critically increase as data is

gathered and the alliance enters a learning phase based on trial and error, experimentation and improvisation (HIPKIN; NAUDÉ, 2006).

In the Buyukozkan and Arsenyan (2012) model, as shown in Figure 2, the authors also argue that trust, coordination, learning, and innovation are essential in the success of a collaborative process.

2.2.3 Decision Making, Risks, and Benefits in Collaborative Product Development

Culture is a determining factor on how the organization makes decisions and shapes collective behaviors (EMDEN; CALANTONE; DROGE, 2006). When partners have compatible cultures, conflicts are easily overcome. To have effective communication and exchange of knowledge, there must be at least minimal agreement on norms and procedures, in other words, on how to do things (EMDEN; CALANTONE; DROGE, 2006). Therefore, a good conflict management system is needed to support a collaborative process to succeed. The system should allow people to collect information, to understand the context and participate in decision-making, increasing its ability to handle conflicts before climbing (CHIN; CHAN; LAM, 2008; CRAWLEY, 1992) which covers issues risks and benefits.

Risk sharing distributes risk between different parties. With high potential projects and investments, the risk increases. Risk sharing is key to enabling organizations to cooperate. Another advantage is loss minimization. In addition, risk sharing within a cooperative relationship can bring productive synergies (CHIN; CHAN; LAM, 2008; MORGAN; HUNT, 1994).

2.3 PERFORMANCE IN COLLABORATIVE PRODUCT DEVELOPMENT AND INNOVATION

Collaborative Product Development performance is considered a construct that covers different aspects, including financial and non-financial measures (NAJAFI TAVANI et al., 2013). Success in developing new products means something that must respond to markets. To succeed, companies must be internally capable and willing to exchange knowledge flow with the outside world and work closely with potential suppliers and markets to innovate new products (SHARIFI; ISMAIL; REID, 2006). Working closely with suppliers in the product development process also offers innovative ideas for design and production stages (BONCAROSSO; LIPPARINI, 1994; NAJAFI TAVANI et al., 2013), resulting in higher productivity, speed and product quality (PRIMO; AMUNDSON, 2002). The innovation process can also be improved by improving the knowledge transfer between the supplier's engineers and technicians, which indicates the value of the company's absorptive capacity in this process (NAJAFI TAVANI et al., 2013). In this study it is meant that the performance in Collaborative Development Process Products in the context of Supply Network means achieving your goal (create a new product in collaboration with the supply chain) with innovation.

To help the theoretical understanding, a table was elaborated that consolidates the concepts presented in the two theoretical models used in this reference. The criterion for this grouping of key success factors in both models is the similarity of the functions handled by each step, as approached in the framework.

Influence Factors in Supply Chain Operations		Success Factors in the Collaborative Product Development Process	
Factors	Authors	Factors	Authors
- Partner Selection	Cousins, 2002;	- Partnership process: Identification, training and management.	Emden et al., 2006; Glaister ; Buckley, 1997; Hipkin ; Naude, 2006; Shah ;Swaminathan, 2008
- Resource Integration	Harland et al., 2004; Wu; Barnes, 2014.		
- Information processing	Argyris; Schon, 1996; Lamming et al., 2000; Mason et al., 2012	- Collaborative process: Trust, coordination, co-learning and co-innovation.	Barnes et al., 2006; Hipkin & Naudé, 2006; Marxt & Link, 2002
- Capture of knowledge			
- Social Coordination			
- Decision Making	Grandori; Soda, 1995; Harland et al., 2004; Kim, 2016.	- R&D process: design, development and marketing.	Chin et al. 2008; Emden et al., 2006; Morgan & Hunt, 1994
- Shared Risks and Benefits			

Table 1 - Theoretical consolidation
(Prepared by the authors)

3 METHODOLOGY

The present study presents a theoretical construction on the Collaborative Product Development process in the context of Supply Networks. The creation of theoretical propositions is fundamental for research in the organizational field (EISENHARDT, 1989). They should be formulated using terminological uniformity and logical arguments in their construction (MAANEN, 2012). Propositions emerge from the literature, evolve concepts and contribute to the operationalization of research, focusing on something to be examined within its scope (YIN, 2010).

Figure 3 shows the path covered in the present study: 1) Review of the scientific literature on the themes Supply Networks and Collaborative Product Development focusing on studies on the influence factors in both processes. During the review were identified few studies on the influence factors of Supply Networks in Collaborative Development Process Products. 2) After identifying the articles on the themes, the most appropriate models were selected to support the theoretical basis of this study (HARLAND et al., 2004 and BUYUKOZKAN; ARSENIAN, 2012), as presented in the subsections of the Theoretical Foundation. 3) Sought out other authors who also studied the influence of factors in Supply Networks and Collaborative Development Products Process for further analysis and better description of the models analyzed and presented in the proposed theoretical model of this study (described in Table of theoretical consolidation). 4) For the analysis and organization of data produced is a cross matrix of the main concepts present in both models that analyzes the influence of factors in Supply Networks and Collaborative Development Process Products, and finally 5) From the cross-referencing of the models we arrive at three theoretical propositions arranged in a model.

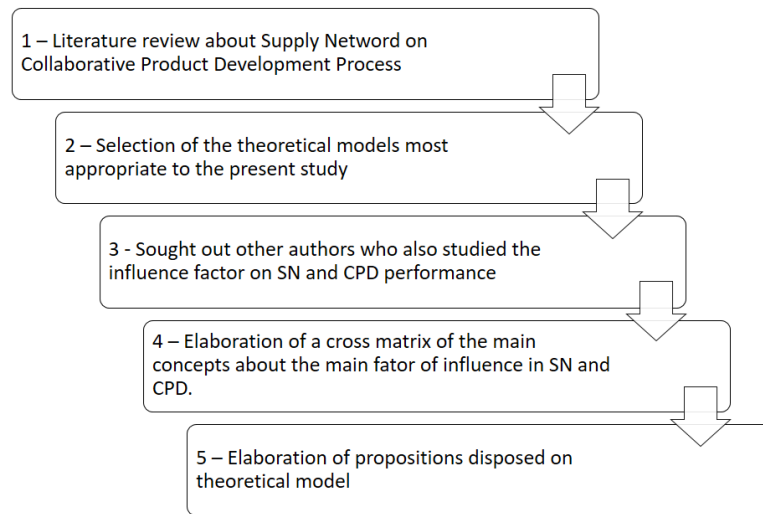


Figure 3 - Methodological process of construction of the theoretical model
(Prepared by the authors)

Studies that present theoretical propositions or discuss existing theories are very useful because they invite the author to reflect on the concrete application of his propositions and contribute to the future research being done for the purpose to test and validate the main arguments of the authors (WHETTEN, 2003).

4 DISCUSSION

In the two models chosen as the theoretical basis of the present study, influence factors are present that complement and resemble each other, especially if analyzed in an integrated way. In the matrix shown in Figure 4 it is possible to understand that there is a correspondence between the influence factors of one model with the other. For example, when it comes to "Selecting Partners and Resource Integration", the model of Harland (2004) can establish correspondence with the factor "Process Partnership" of Buyukozkan model and Arsenian (2012), because it discusses the importance of the set of tasks related to "partner selection" and all the issues that involve it. The same correspondence and association can be established between the other factors in both the models as shown in Figure 4 when associating and crossing the factors of each model.

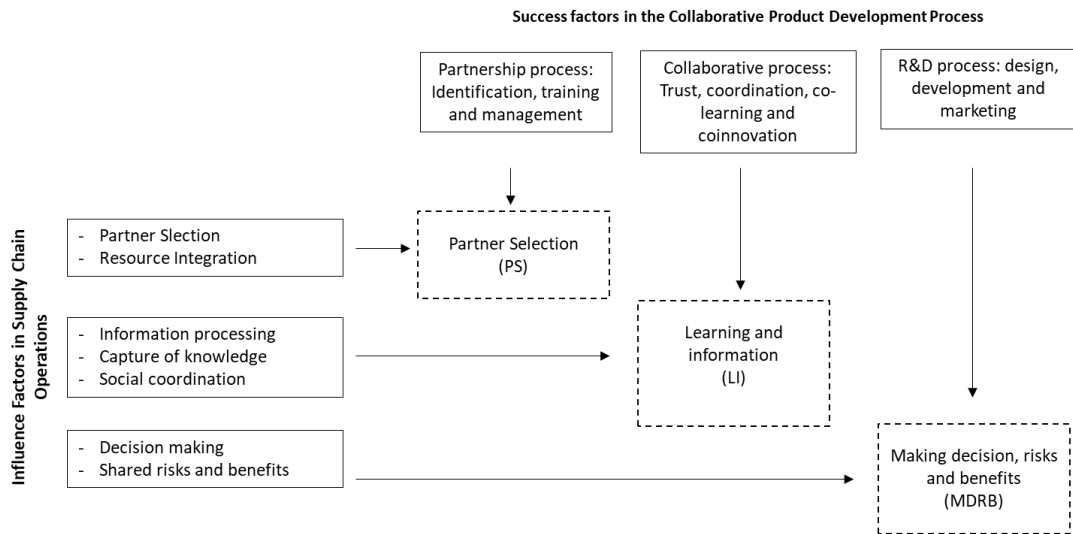


Figure 4 - Matrix of crossing concepts
(Prepared by the authors)

As the present study aims to broaden the theoretical understanding of the influence of the Supply Network on the performance of the Collaborative Product Development Process, it is possible to obtain as a result the elaboration of a conceptual model which can be observed in Figure 5. The conceptual model is composed of three propositions developed based on the theoretical foundation.

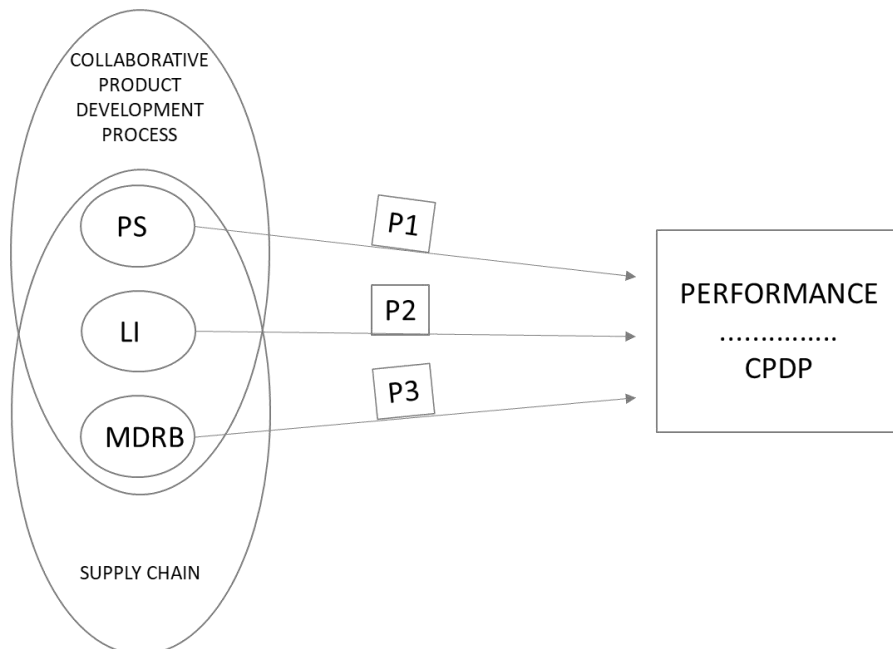


Figure 5 - Theoretical model
(Prepared by the authors)

Proposition 1 (P1): *The Partner Selection Factor (PSF) influences the quality and strategy performance of the Supply Chain in the CPD process.* The supplier selection activity occurs from the managerial decision to subcontract supplies or services necessary for the operation of the company. The proposition 1 follows the understanding that the practice of partner selection is critical to the performance of collaborative development process in the context of supplies in the network to choose suppliers who meet the characteristics needed in the construction of partnership so that the collaboration strategy can be successful, which makes it imperative to select companies that are competent, trustworthy and committed and aligned with the objectives and results of the whole chain, directly influencing the quality of the project. Companies that choose to work collaboratively are aware that their teams will work together which reinforces the importance of having cultural alignment and organizational thinking that the strategy of organizations disappear in the same direction purposes (BÜYÜKÖZKAN; ARSENYAN, 2012; COUSINS 2002; EMDEN; CALANTONE; DROGE, 2006; GLAISTER; BUCKLEY, 1997; HARLAND et al., 2004; HIPKIN; NAUDÉ, 2006; SHAH; SWAMINATHAN, 2008; WU; BARNES, 2014).

Proposition 2 (P2): *The Learning and Information Factor (LIF) influences the performance of the coordination of the Supply Network from the perspective of the CPD process.* Collaborative relationships between companies can enable access to a wealth of knowledge for innovation processes (HUIZINGH, 2011), allowing the companies participants becomes receptive to new ideas from the external environment (REED, STORRUD-BARNES; JESSUP, 2012) and move towards joint R & D development models and new value-creation practices for participating organizations. Thus, Proposition 2 follows the principle that the information exchanges and all the social coordination of the process, which also involves trust, influence and can determine the success of a Product Collaborative Development Process in the context of the Supply Network (ARGYRIS; SCHON, 1996; BARNES; PASHBY; GIBBONS, 2006; HIPKIN; NAUDÉ, 2006; LAMMING et al., 2000; MARXT; LINK, 2002; MASON; OSHRI; LEEK, 2012).

Proposition 3 (P3): *The Shared Decision, Risk and Benefits Factor (SDRBF) influences m in the performance of the Supply Chain in the CPD process.* Making joint decisions and sharing risks involve cultural aspects related to the behavior of the people involved in a collaborative project. What points to the importance of a discussion of risk sharing and how decisions will be taken and may even include formal instruments to regulate this factor, if necessary? Proposition 3 follows the understanding that in the operational process of product creation and development there are decisions to be made in a shared way that involve shared risks and benefits. These decisions, risks and benefits are embraced from project development, through implementation and market decisions that involve taking shared risks as well as sharing benefits. They need to be well aligned with the organizations participating in the project which may, even, have their regulation through formal instruments between the parties (CHIN; CHAN; LAM, 2008; EMDEN; CALANTONE; DROGE, 2006; GRANDORI; SODA, 1995; HARLAND et al., 2004; KIM, 2016; MORGAN; HUNT, 1994).

Based on the proposed model and the theoretical propositions presented in it, this study aims to contribute to the understanding of the influence of the Supply Network in the Processes of Collaborative Product Development, providing an integrated view of concepts that are more commonly treated separately in the literature in each phenomenon (SN and CPD). It is observed that many authors deal with the topic of Partner Selection, which denotes the importance of this influence factor in SN as well as in CPD. Meanwhile the questions on Learning and Information Exchange between companies is a topic on which has been debated which are the best ways to enhance this factor that has been gaining more and more relevance in the literature. The Joint Decision-Making Factor between companies, as well as Risk and Benefit Sharing, has been seen in the literature in a modest way and in a more aligned approach to cultural alignment

among the organizations involved, an aspect not addressed in this study that can serve as departure for future studies.

5 CONCLUSIONS

This study sought to verify and understand theoretically the influence of the Supply Network in the Collaborative Product Development Process through the factors influencing its performance. It can be verified, through the proposal of the theoretical model presented in the present study, that there are factors of influence in the success in the CPD from the point of view of the Supply Network. This study contributes to the theory of both Collaborative Product Development and Supply Network theories by providing insights to better understand the success factors of these processes.

Also, the study provides managerial contributions with practical implications for managers, drawing attention to the various factors influencing the SN in CPD. The development of theoretical propositions helps to explain the practice and/or provides a framework for the study to be applied empirically, seeking the validation of the arguments presented by the authors. The need for practical application of the theoretical model in different organizational segments aiming to validate the theoretical concepts presented is a limitation of the present study.

As a theoretical limitation, the study presents a limited number of factors influencing SN in CPD according to the selected models, and it is important to remember that even in the model proposed by Harland (2004), two variables with deep social characteristics were not addressed here, also representing a limitation of the present study. Thus, it is suggested to extend the study to other influence factors as a way of confirming the conclusions obtained, as well as the application of the model through empirical research, with the purpose of testing the propositions presented in the present study.

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