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Towards Performance Measurement in Collaborative Contexts

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Abstract

In the last few years, there has been an increasing interest in pursuing collaboration relationships within interorganizational environments; that is to say, among members of a Supply Chain/Network. The aim of collaborative relationships is to obtain competitive advantages. However, if this type of relationship is not properly managed, it may not always be successful. In this sense, it is necessary to understand the main aspects that compose interorganizational relationships within these contexts so that these aspects can be managed. In this paper, a literature review of works that expose the main aspects of relationships within interorganizational environments is presented under a twofold perspective: works that expose the main characteristics of interorganizational relationships and Performance Measurement Systems (PMSs) for interorganizational environments.

Keywords: performance measurement, collaboration, supply chain, networks

1. Introduction

During the last few years, numerous works have exposed the importance of establishing and maintaining collaboration relationships among the partners of the Supply/Distribution Chain/Networks (S/DC/N) (Barrat, 2004; McLaren et al., 2002). According to Mentzer (2001), some of the financial and non-financial objectives pursued by organizations for establishing collaboration relationships are: reduced inventory; improved customer service; better delivery through reduced cycle times; faster speed to market of new products; stronger focus on core competencies; increased sharing of information, ideas and technology; improved shareholder value; and competitive advantage over other supply chains. However, this type of relationship is not always successful. If **relationships** are not properly **managed**, conflicts and disadvantages could arise. In this sense, Performance Measurement Systems (PMSs) are tools that could aid to define and collect the necessary information for S/DC/N management, i.e., they are a management tool.

In this work, a literature review of works that expose the main aspects of relationships within interorganizational environments is presented. The objective of this paper is to provide the main aspects of interorganizational relationships that are to be managed under a twofold perspective. The first perspective is composed by works that present the main characteristics of interorganizational relationships and the second perspective includes PMSs for interorganizational environments.

The structure of this paper is as follows. Firstly, an overview of interorganizational environments is provided. Secondly, a review of works that identify the main characteristics of interorganizational relationships is presented. Then, performance measurement systems for interorganizational environments are shown. Finally, conclusions of this work are exposed.

2. Interorganizational Environments

Competition, global markets, demanding customers and reduced product lifecycles are changing the way of functioning and organizing enterprises. In the last years, enterprises are establishing new work procedures. These procedures comprise moving towards coordinated manners of working by configuring Supply Chains/ Networks (SC/N).

Lambert et al. (1998) define a **supply chain** as "*the alignment of firms that brings products or services to market*". In this definition, the customer is included as part of the supply chain. Mentzer et al. (2001) define supply chain as "*a set of three or more entities (organizations or individuals) involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer*". In this last work, the authors note that there is a definite distinction between supply chains as phenomena that exist in business and the management of those supply chains due to the fact that supply chains exist whether they are managed or not. In this sense, Stadtler (2005) defines **supply chain management** as "*the task of integrating organizational units along a supply chain and coordinating materials, information and financial flows in order to fulfil (ultimate) customer demands with the aim of improving competitiveness of the supply chain as a whole*".

In addition to managing material, information and financial flows, another important aspect to be considered within these interorganizational contexts is the management of the relationships among the members of a supply chain/network. As companies are establishing **closer or collaborative relationships** with their interacting partners to gain competitive advantage, the management of these relationships has to be addressed. In this sense, a broader overview of interorganizational environments includes not only the management of the hard aspects of the supply chains/networks but also the soft (behavioural) features in which the management of relationships is a fundamental activity (Mohr and Spekman, 1996; Handfield and Betchel, 2004).

3. Characteristics of Interorganizational Relationships

There are different characteristics that contribute to the success of relationships between members of a supply chain/network. Mohr and Spekman (1996) present a list of characteristics and success factors for partnerships. The three success factors include satisfaction with the other partner support activities, satisfaction with profits, and sales volume. The characteristics are presented in three groups: 1) partnership attributes, 2) communication behaviour, and 3) conflict resolution techniques. Each group comprises different attributes.

1) The four partnership attributes are:

- **Coordination** is related to the definition of each member responsibilities and makes reference to the tasks that are to be taken for linking activities performed by different members in a seamless manner. In this way, successful working partnerships are guided by coordination actions towards the achievement of mutual objectives. If coordination is

given, then there is a reduction/improvement in duplication of work and costs, and therefore, an increase in efficiency of the supply chain/network is obtained.

- **Commitment** refers to the willingness of the partners to perform effort on behalf of the relationship. It is the establishment of the foundation of the relationship and it is based on being supportive in solving problems together. A high level of commitment provides the context for the achievement of individual and mutual goals.

- **Trust** is based on the belief that the partner is reliable and will fulfil its responsibilities acting fairly. A partner trusts another partner if considers that decisions made by this last one will be in the interest of both parts. Therefore, it indicates the extent to which each part of the relationships will behave non-opportunistically.

- **Interdependence** is related to fact that one firm needs to rely on others to perform tasks on its behalf.

2) The four attributes of communication behaviour are:

- **Participation** refers to the joint involvement in planning and goal setting for establishing mutual expectations and specifying cooperative efforts.

- **Communication quality** considers the timeliness, accuracy, adequacy and completeness of the information exchanged.

- **Shared information** comprises to the extent to which critical private information is communicated between partners.

3) The five conflict resolution techniques are:

- **Joint problem solving** has a positive impact on relationship success. It provides a context for expressing the issues of each partner in order to verify the course of the relationship.

- **Severe methods** is related to using domination to resolve conflicts what tends to increase the fundamental differences that exist between the partners.

- **Smoothing over or avoiding the issue** concerns with choosing to avoid conflict instead of solving it. This attitude is likely to diminish the quality of the relationship.

- **Arbitration** comprises the use of an external part to the relationship in order to mediate between the partners. The use of arbitration for solving problems has to be evaluated because it is possible that this fact may decrease the partner's attitudes towards changing their beliefs. It seems that internal resolution is more effective.

- **Persuasion** is concerned with the communication intended to induce a belief or an action. If the persuasive discourse focuses on mutually beneficial gain then, it is an effective technique for conflict resolution. However, if one partner observes opportunistic behaviour, it will be detrimental for the relationship.

Handfield and Bechtel (2004) identify eight elements of interorganizational relationships that may influence the evolution on supply chain management, taken from different disciplines

(marketing, economy, strategy and management). The eight elements are: 1) trust, 2) power, 3) dependency, 4) economy, 5) collaboration, 6) assets, 7) risk and 8) communication.

- **Trust** is one of the most commonly cited elements. It can be grouped into eight approaches depending on the author consulted. The eight conceptual meanings are trust as: reliability on another party; the competence of a party as a component of trust; an altruistic (affective) faith or goodwill toward another party; vulnerability; loyalty-based trust; a combination of reliability and affective trust; a combination of vulnerability, affective and reliability; and finally, a combination of all the approaches.

- **Power** is normally understood as counteracting of trust. Among the types of power are: referent, legitimate and coercive power.

- **Dependence** has two meanings. One meaning is related to the relationship between two parts. The second meaning refers to the power one party has over another due to the dependence such as to the high percentage of sales.

- **Economy** has been related to the prisoner's dilemma and the transaction cost analysis. However, these approaches do not consider the cooperation and trust concepts respectively. Other more recent economic theories include trust as incidentally occurring in a starting relationship that after cooperation evolves towards trust.

- **Collaboration** is referred to as mutually shared alliances or collaborative relationships through alliances. Trust, generosity, feedback and repair are some of the principles that collaboration provides. Other elements of collaboration are: expected time of the relationship, goal congruence, and unconditional constructiveness.

- **Asset specificity** relates to the investment each part contributes in assets for a specific relationship. It may be comprised by four types of assets: dedicated asset (capacity), human asset, site asset and physical asset (specific equipment).

- **Risk** relates to the extent to which the partner is willing to invest due to the relationship. Different levels of trust and risk may appear during the evolution of the relationship.

- **Communication** relates to the information shared and not shared among the partners. High levels of trust demand fundamental information sharing.

Barratt (2004) develops a conceptual framework for supply chain collaboration. It is composed by three main blocks (see Figure 1): strategic, implementation and cultural elements. The first block includes the strategic collaboration elements: technology role, business case, corporate focus, intra-organizational support and resource commitment. If collaboration is to be sustainable, these elements are to be present. The second block comprises the collaboration elements; that is to say, activities that need to happen if collaboration is to succeed through the supply chain: inter-functional activities at intra-enterprise and inter-enterprise levels, process alignment, joint decision making and existence of supply chain performance indicators. Finally, the third block comprises the collaborative culture elements: internal and external trust, mutual benefit and shared risk, information exchange (transparency and information quality), and openness and communication.

Figure 2 illustrates the collaboration elements through the different organizations in the context of the Supply Chain. It can be deduced that aligning all the implementation elements within two organizations, demands an important effort so that, it is even more complex to

perform when the number of collaborative members increases. That is the reason why establishing collaboration relationship has to be **focused on key/strategic partners**. Organizations have to select the strategic partners and clearly differentiate the way of interacting with them.

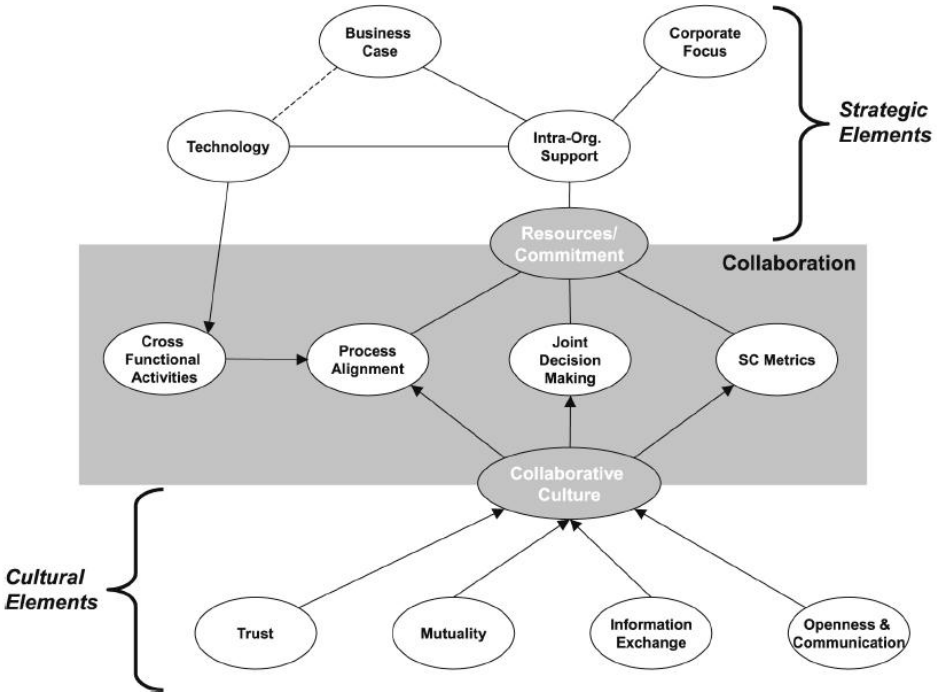

Figure 1. Supply Chain Collaboration Elements (Source: Barratt (2004))

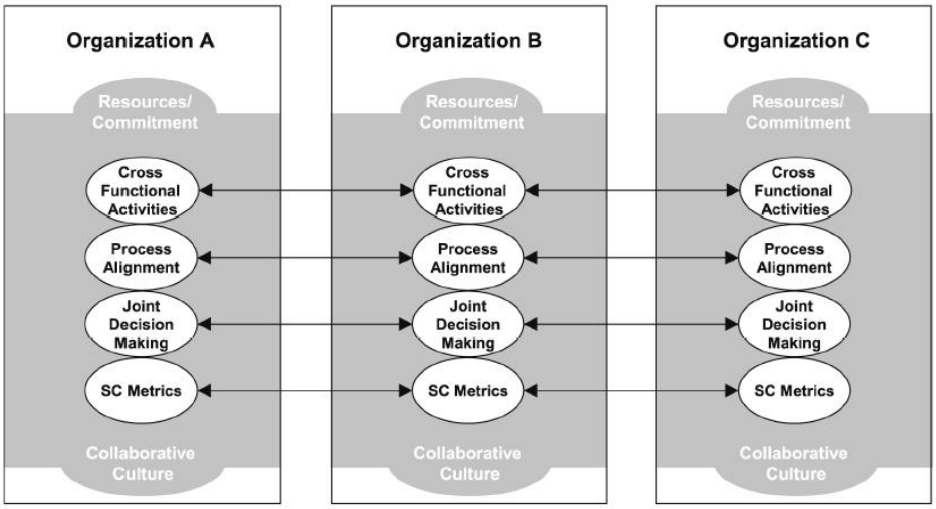

Figure 2. Collaboration Implementation Elements through the Supply Chain (Source: Barratt (2004))

4. Performance Measurement Systems for Interorganizational Environments

In the last years, different works have presented PMSs for interorganizational environments. Brewer and Speh (2000) present the application of the Balance Scorecard (Kaplan and Norton, 1992) for performance measurement of supply chains. The Balance Scorecard for supply chains considers: 1) four perspectives (internal, financial, customer, and innovation

and learning) and their inter-relationships, 2) generic goals for each perspective of the supply chain, and 3) measures corresponding to these generic goals.

Alfaro et al. (2007) develop a PMS for enterprise networks that includes a methodology and a framework. The methodology defines three phases: 1) Definition of the strategic framework, 2) Definition of the process framework and 3) Follow-up and monitoring of the defined performance elements. Figure 4 illustrates the generic framework of the phases 1 and 2 of the methodology. It is structured in three levels: enterprise network, supply chains that take part in the supply network and individual companies that integrate each supply chain. Figure 5 illustrates the detail of the generic framework. It comprises three dimensions: functional levels (Enterprise Networks, supply chain and individual Enterprise), perspectives (financial, customer, process, and learning and growth) and performance elements (structure).

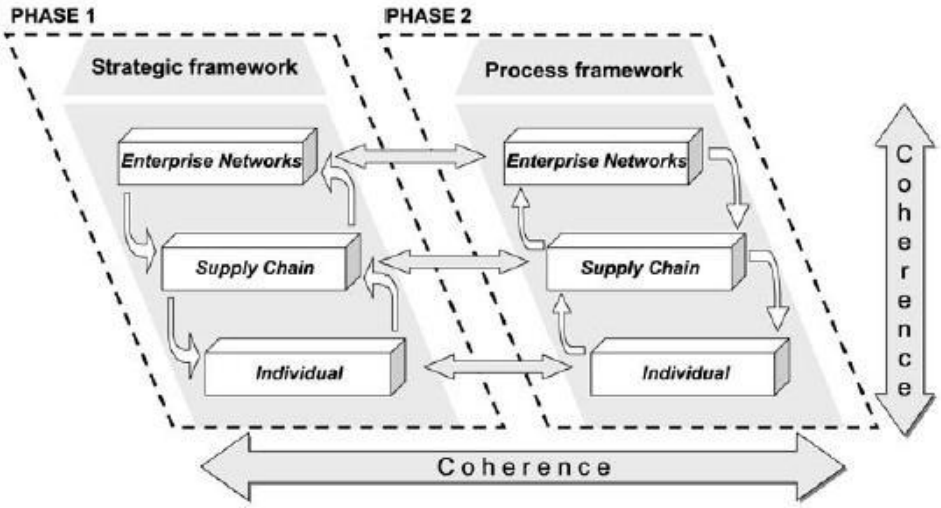

Figure 4. Generic Framework PMS-EN Methodology: Phases 1-2 (Source: Alfaro et al. (2007))

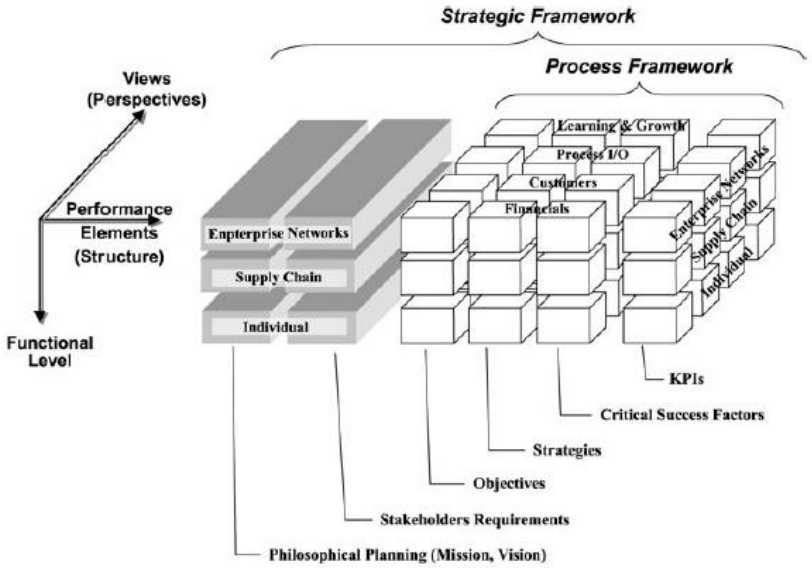

Figure 5. Detailed Generic Framework PMS-EN Methodology: Phase 1 (Source: Alfaro et al. (2007))

Blanc et al. (2007) present a PMS for the evolution management of interoperable supply chains. Their work is based on the Grai Evolution Method (GEM) and considers two different

PMSs. One PMS is for managing the evolution (PMSE) towards interoperable supply chains that means establishing a PMS to measure how heterogeneity is reduced when technical solutions are implemented in the systems. The other PMS is for managing the supply chain (PMSSC) which includes interoperability indicators. PMSE is used to guide the interoperability solution evaluation and is transformed into the PMSSC when collaboration becomes effective. The work also presents a method, called ECOGRAI method, to evaluate interoperability between two enterprises in a supply chain. This method comprises six phases: 1) modelling the control and controlled structure, 2) identification of objectives and coherence analysis by performance aggregation, 3) identification of decision variables and analysis of conflicts between them, 4) definition of performance indicators and internal coherence analysis, 5) design of information system and 6) integration of performance indicators in an enterprise information system. Figure 6 shows an example of a PMS for a manufacturing company that considers interoperability performance indicators of a maintenance company.

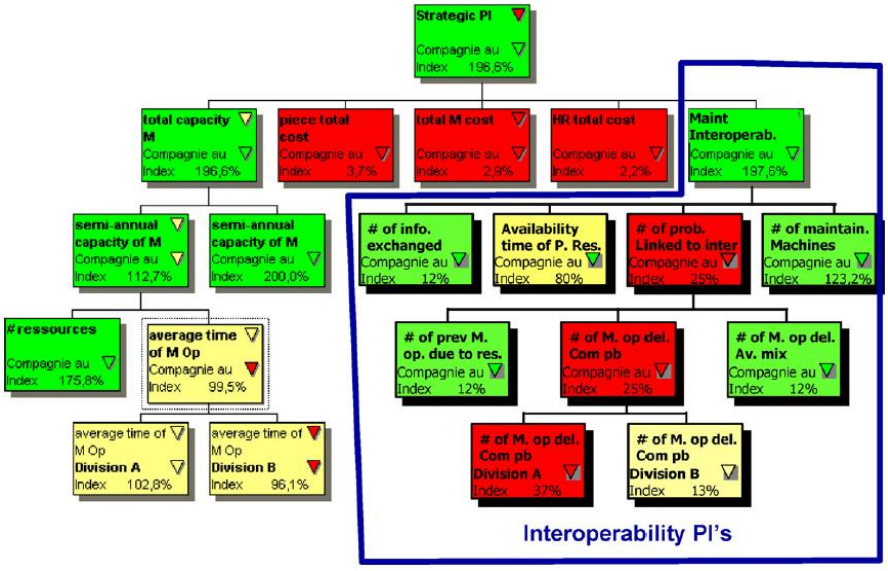

Figure 6. Hierarchical Structure of PMS (Source: Blanc et al. (2007))

5. Conclusions

Companies are changing the way they interact with other companies looking for more cooperative models. Establishing collaboration relationships within Supply Chain/Network contexts are a potential source for increasing competitiveness. From a strategic point of view, since it is not possible to collaborate with all the companies that a company interacts; key suppliers are to be selected.

Collaborative relationships are based on common objectives for the SC/N. From a supply chain management perspective, achieving these objectives depends on managing the material, information and financial flows. Furthermore, there are behavioural aspects related to this type of relationships that have to be managed if these relationships are to be sustainable. That is to say, these aspects are to be addressed to avoid that they act as barriers for the collaborative relationship. In order to understand further the main aspects to be managed within collaborative environments, some relevant works that present the main characteristics of interorganizational relationships and Performance Measurement Systems for interorganizational environments have been reviewed.

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