Exploring chain, network and cluster collaborative practises: implications for SME's

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Abstract

Collaboration among enterprises has been rendered as one of the most important issues in the business agenda, either as a result of the globalization and deregulation of markets, or as result of the ICT revolution. Both factors have created a business reality where success in the collaboration practises followed, may result in improvements on the competitive position of enterprises. The paper starting from the basic business activity of the individual enterprise, looks into the chain, network and cluster collaborative practises and analyses their characteristics and the implications for SME's. In addition, it provides insights regarding the opportunities, the benefits, the requirements and the risks related to each collaborative practise. The article finally argues that different collaboration practises are required, as enterprises and the industrial sectors where they operate present distinctive characteristics.

Keywords: chains, networks, clusters, enterprises, collaborative practises, SME's

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Introduction

The globalization and deregulation of markets along with the Information and Communication Technology (ICT) revolution have influenced most of the business sectors all over the world, encouraging new forms of competition, as well as new forms of cooperation among enterprises. The changing nature of competition, from the traditional "enterprise vs. enterprise" model, to more complex competition models, where companies can be parts of supply chains or extended business networks, is continuously becoming reality (Christopher, 1998), influencing both Small-Medium Enterprise's (SME's) and large enterprises, and increasing the importance of collaboration. Even in cases where the "supply chain vs. supply chain" competition model is not applicable, the issue of collaboration still remains a fundamental one. The ability of enterprises to compete has been directly linked with their ability to collaborate with other enterprises. O'Keefe (1998) suggests that enterprises nowadays have to be first and foremost a good collaborator in order to become an efficient competitor.

Within this dynamic and changing business environment enterprises are often challenged to follow or not a specific type of collaborative practise. They need to decide whether they should create a new partnership, or whether they should modify their relationships and interactions with other enterprises or even whether they should abandon a collaborative practise. These decisions are of significant importance particularly for SME's where their limited resources in terms of personnel, finances and technology infrastructure do not allow unconsidered and rash choices which may reduce their competing ability. In order to take the right decisions, enterprises need to have a clear view of the opportunities, the benefits, the requirements and the risks associated with each alternative collaborative practise that they choose.

In this paper, starting from the basic type of business activity, the individual enterprise, specific characteristics of three different types of collaborative practises namely the supply chain, the network and the cluster are described and analysed. Next, based on a literature review, a number of critical collaboration perspectives that influence the decision of enterprises to follow or not a particular collaborative practise, is identified. By rating each collaborative practise to the aforementioned dimensions the paper aims to enable enterprises not only to recognize their current level of engagement but moreover to understand how suitable they are in meeting the requirements.

Collaborative practises

Collaboration is about organisations and enterprises working together. It results from enterprises' recognition that there are cases where working and operating alone is not sufficient to achieve the desired goals (Huxham, 1996). During the 1990s into the new millennium, there has been an increasing interest in the development of collaborative variants between enterprises of all sizes, industries and nationalities. The entrance of new global competitors, industry consolidation, alternative distribution or the evolution of technology may trigger this realization. Independent companies are working together based on shared values or a common goal of doing business to jointly exploit a particular business opportunity.

Collaboration is not an easy process and intrinsic difficulties exist either as a result of the specific and diverse characteristics of enterprises to collaborate or as a result of the business environment where an enterprise operates. In this paper, starting from the point of individual enterprise, where essentially no collaboration takes place, three different collaborative practises namely the chain, the network and the cluster are presented.

Individual enterprise

By individual enterprise we refer to the most basic type of business activity where enterprise's main emphasis is given on its activities related to the development of process maps of its internal supply chain (Harland, 1996). Enterprises belonging to this group are paying limited or none emphasis to the relationships with other enterprises, underestimating the value of collaboration. The focus here is on the integration of business functions involved in the flow of materials and information from the inbound to the outbound end of business. This approach represents the enterprise's effort of application of production and organization techniques by pursuing operational improvements in specific activities. Better quality, lower prices, inventory reductions, lower costs are accomplished in this level. Cross-functional and cross-business unit cooperation arises in order to achieve internal excellence. Business planning and execution decisions are taken enterprise-wide.

Chains

By chains we refer to the particular kind of collaborative practise, which is characterized by the sequential order of the interactions involved. The chain concept emphasizes vertical relationships of a dyadic form that exist between the upstream and downstream partners of a focal firm (Harland, 1999). It can be distinguished managing dyadic, i.e., two party relationships and a chain of business including a supplier, a supplier's supplier, and so on, and/or a customer, a customer's customer. Cooperative organizational relationships, effective business- business processes, and high levels of information sharing create high-performing value systems that provide chain members a sustainable competitive advantage.

Throughout the last decades the concept of chains has undergone significant changes (Evans and Danks, 1998). From a cost driven approach in the 1970's and the 1980's, dealing with supply, transportation, distribution issues and the restructuring of activities and the redesigning of processes more efficiently, the concept emerged to an adding value driven approach in the late 1980's and early 1990's. Enterprises recognized the need of having delighted customers and the importance of information sharing and of having efficient information flows in addition to efficient material flows. The chain concept became very famous in the management literature and in businesses' real life, however critics exist regarding the applicability of the concept in situations of competition. Rice and Hoppe (2001), argue that the "chain vs. chain" competition model works in some cases and some industries but it does not apply to every sector.

Networks

The recognition of networks, as a distinct organisational form and collaborative practise open to analysis and theory building is rather recent (Miles and Snow, 1986; Thorelli, 1986; Jarillo, 1988; Powel, 1990; Snow et al. 1992). The concept of networks expands the chain concept by emphasizing, not only in vertical relationships, but also lateral and horizontal relationships among independent entities (Farina and Zylberstain, 2003). Overall, networks are addressing all questions on inter-organisational relationships of more that two firms (Lazzarini et al, 2001). In networks in comparison to chains, the sequence of transactions and interactions is arranged not only by means of the market or through formal mechanisms, but also by the use of informal and reciprocal mechanisms (Diederen and Jonkers, 2001).

A number of network classifications exist in the literature. Aldrich and Glinow (1992) classify them into personal and social and perceive the role of networks as a broker within a set of relationships. Grandori and Soda (1995), differentiate networks by the extent to which the links between organizations are formalised whereas Cravens et al. (1996) relate the type of network relationship to the degree of unpredictability and risk in the environment. Brown and Locket (2004), based on the above and taking the SME's perspective perceive networks as a more highly developed form of cooperation, which exhibits both high degree of structure and high degree of integration.

Regarding network development, there are many approaches that explain it. Powell (1990) and Economides (1996), suggest that pure economic reasons foster enterprises to develop network relationships. Camps (2001), raises the issue of power asymmetry where an enterprise can compel another one into participation in a network. Sauvée (2002) suggests that enterprises in networks adopt common strategies, share the residual decision rights and are characterised by the lack of a dominant entity. The development of networks nowadays is continuously becoming more apparent, raising the issue of balancing dependency and autonomy for enterprises.

Clusters

While Porter's (1990) idea on industrial clusters was introduced in the beginning of nineties, the presence of this phenomenon can be traced back in history (Piore and Sabel, 1984; Putnam, 1993). A precise definition or at least a set of principles for delimitation of clusters appear to be somehow missing in much of the cluster literature, as also emphasized by Maskell (2001), due to multidimensionality and vague character of clusters which pose problems of theoretical and empirical definition, as well as, methodological investigation. According to Porter (1998), clusters can be defined as: "geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (for example universities, standards agencies, and trade associations) in a particular field, linked by commonalities and complementarities".

The cluster concept draws much from the theories of economic geography, transaction cost economics and the classical Marshallian externalities (Krugman, 1991; Dalum et al., 2002; Matopoulos et al., 2004). It focuses on the linkages and interdependencies among value chain actors, especially on the fact that clusters go beyond traditional vertical supply chains and horizontal networks, operating more as cross-sectoral networks consisting of dissimilar and complementary firms, which are specialized around a specific stage in the value chain (Roelandt et al., 2000; Maskell, 2001).

Clusters are based on complex relationships among the involved partners. These relationships can be built on common or complementary products /services, production and distribution processes, core technologies, resource requirements, logistics, education, training and outsourcing services support. Porter (1998) argues that there are four reasons responsible for the existence of clusters. Clusters can occur because of historical circumstances, because of geographical circumstances (industries already located in a certain place), because of innovations and accidentally.

Critical perspectives in collaborative practices

There are many perspectives upon which collaborative practises could be classified. Based on a literature review the following seven perspectives were selected as very important: time, membership, management control, drivers for agreement, major outcomes, shared business goals and technology infrastructure. *Time* refers to the duration of interaction and relationships among enterprises and it is has been recognised as one of the more important perspectives (Anderson et al., 1987; Anderson and Narus, 1990; Spekman, 1988). It can be distinguished to temporary, short-term, long-term and indefinite. Temporary, may include sporadic interaction and transaction with another party that do not have any regularity, while indefinite may refer to repeated transactions between parties by choice that take place over a very long period. A short-term perspective focuses on a single or limited set of transactions, while a long-term perspective includes repeated transactions between parties, either by choice or because of market conditions (Dabholkar and Neely, 1998).

Membership defines the flexibility and the commitment of the enterprises to the interaction process and it is strongly related to the investments undertaken in order to enter the collaborative practise. Indirectly, it is related to the easiness of joining or leaving a collaborative practice. No membership and full membership are the two ends of this perspective. No membership implies that enterprises find relatively easy to leave a specific collaborative practise and join another, as the investments undertaken are not significant. On the contrary, full membership implies that the commitment of the enterprise to the collaborative practise is strong and significant investments have taken place, reducing the possibility of leaving the collaborative practise. For example, exclusivities in products and services may be the characteristics of a full membership situation.

Management control is about the entity having the control over the collaborative practise. It is strongly associated with the issues of power dependence and power asymmetry among enterprises. In situations of collaboration there may be cases where the more powerful entity dominates other enterprises by exercising its power. However, there may be cases where the element of power may not be critical in collaboration.

Drivers for agreement refer to the basic element that acts as they catalyst in decision taking process where negotiations take place and arrangements need to be done. To a great extent it is related to the *management control* of a collaboration situation. Arrangements, mutual or not driven by a dominant entity, or by the majority of enterprises equally, may be the alternatives.

Major outcomes refer to the main benefits for enterprises arising from the collaborative practise followed. For example, joining a particular collaborative practice may result in cost reductions on the one hand, and a miss in the autonomy of the enterprise on the other hand.

Another perspective that is widely cited in the literature is *Shared business goals* (Clopton, 1984; Day and Klein, 1987; Lyons et al., 1990; Perdue et al., 1986). It refers to whether enterprises following a particular collaborative practise have a minimum of shared goals or not. Conflicting goals may depreciate the value and outcome of collaboration while shared business goals may result to synergistic situations and improvements.

Finally, *technology* refers to the ICT infrastructure needed in order to make a specific collaborative practise work. Obviously, different collaborative practises may require different ICT infrastructure as the nature and type of exchanges alters. This changing variety of ICT application in relation to the type of collaborative practise has been strongly cited in the literature (Robey and Sales, 1994; Kumar and Dissel, 2001). For example, long-term, membership-based relationships may require specific investments which characterised by compatibility, while short-term relationships may require more open platform systems

Positioning collaborative practices

The literature revealed a number of important perspectives in situations of collaborations. In figure 1, these perspectives are presented in the context of individual enterprise, chain, network and cluster collaboration practises. An analysis of each collaborative practise follows.

< Insert Figure 1>

Individual enterprise

Enterprises belonging to this group are often characterised by spot transactions with other enterprises. Power asymmetry that exists among enterprises, drives the business agreement process and its control. Autonomy in business activity is the major outcome for individual enterprises. Individual enterprises may have opportunistically and occasionally shared business goals with other enterprises. Technology infrastructure is not necessary and when available it facilitates inter-enterprise automation processes.

Chain

In this collaborative practise, which is characterised by long-term sequential and rather stable relationships, full membership is often required. Usually, chain formations are characterized by the existence of a dominant enterprise, which sets the rules of the interaction and the directions for action not always under the optimum level of agreement. The major outcome of this collaborative practise includes performance improvements and uncertainty reductions. Shared business goals although difficult, do exist at the intersection between internal improvement of the focal enterprise and external needs of other supply chain members. Considerable efforts are needed in order to balance business goals and to avoid conflicts which may arise in logistic activities. The operation of this kind of collaborative practises is facilitated by ICT infrastructure investments. In particular, for logistic activities, ICT applications, such as EDI, are absolutely necessary in order to coordinate and synchronise them.

Network

Network collaborative practise is characterised by short or medium-term relationships, often project based, where membership is sometimes required. In comparison to chains, management control expands the dominant enterprise, by equally involving all network members or alternatively the majority of enterprises. Mutual arrangements arising as a result of the management control are the main drivers for agreement. The major outcome of this collaborative practise is the ability to switch trading partners in a very flexible way in response to rapid changes that often occur in the business environment. Enterprises forming the network do not share business goals others than those arising from the particular task or project that they undertake. Technology investments in comparison to the chain formation are not only helpful but absolutely necessary. These ICT applications should be of more open platform in order to enable flexibility and compatibility among enterprises.

Cluster

The relationships of enterprises forming a cluster are rather characterised as indefinite and indeterminate with respect to their duration. No membership is required and regarding the control of this formation it is based on the single enterprise but often empowered by governmental policies (Martin and Sunley, 2001). Social norms and reciprocity are the main drivers for agreements. The major outcomes of this formation are information and knowledge-sharing/ diversity which energize innovation creation. Enterprises forming clusters do not have shared business goals, since they usually operate completely autonomously. Technology infrastructure must enable interoperability and compatibility at the same time in order to facilitate information and data sharing and exchanging.

Assessing benefits, opportunities, requirements and risks associated to each collaborative practice under the SME's prism

The development and growth of SME's is absolutely critical for the economies of many countries all over the world, since SME's are often constitute the predominant institutional type. In general, SME's follow the basic characteristics of large enterprises, however they are characterised by two main characteristics (Caldwell, 2000; OECD, 2000; Barton, 2001; ENSR, 2002; Quayle, 2002). In particular:

– SME's often have very limited financial resources which deteriorate their investing decisions, since affording the luxury of making mistakes is not feasible. In addition, the lack of financial resources usually prevents SME's from hiring the personnel with the appropriate skills.

– SME's have usually a conservative business culture that has not been oriented to high tech, and relies on personal face to face relationships. Moreover, their business activity is to a great extent driven by traditional transaction methods which are not characterised by trust and mutuality particularly when dealing with large enterprises.

Given the specific characteristic of SME's on the one hand, and the changes in the business environment on the other hand, SME's are facing enormous challenges regarding the collaboration strategies and practises that will follow. Different collaboration practises may have different benefits and opportunities, as well as requirements and risks. In figure 2, the benefits, the opportunities, the requirements and the risks related to each alternative collaborative, are presented. An analysis of the above issues follows.

<Insert Figure 2>

Operating as individual enterprise

The main benefit for enterprises operating this way is that they remain independent and autonomous to a great extent. This implies independent decision taking in every issue, better control over expenses and revenues and increased flexibility and adaptability in changes in the business environment. The opportunities that exist in this stage are mainly related to short-term issues, for example exploiting a particular market condition. The requirements that exist in this stage are mainly related to the fact that enterprises need to be in a situation of vigilance in order to catch market opportunities that arise. As a result, good knowledge of the market is required which is achieved by effective monitoring.

Enterprises operating this way are facing significant risks mainly related to the opportunistic behaviour that will face from other enterprises. Particularly, when it comes to transaction with large enterprises they are forced to accept their conditions, since the increased competition enables large enterprises to turn to other suppliers. In addition, the turbulent business environment may result in situations where enterprises alone are not able to respond.

Operating in a chain

The main benefit for enterprises operating this way is that they assure sales volumes of their products and services. This situation enables enterprise to operate in a more stable way in the long term avoiding taking risks. The opportunities that exist in this stage are mainly related to future. For example, there is an opportunity for SME's to become absolutely indispensable for the chain where they operate and the dominant entity which runs the chain. Although difficult to achieve it is possible, if enterprises become non-replaceable or difficult to replace by delivering a very specialized product or service both in terms of cost and value added. Once achieved, enterprises may achieve better terms in the mutual arrangements, since the cost for the dominant enterprise to change partner becomes significant.

The requirements for entering a chain refers to the decisions that SME's often will need to take in order to satisfy the dominant enterprise and to follow the norms and the standards stipulate by them. Significant risks exist under this collaborative practise. The more important ones are the transaction risks. Transaction risks are the costs associated with the exposure to being exploited in the relationship and are divided to transaction-specific capital, information asymmetries and loss of resource control (Clemons and Row, 1992; Kumar and Dissel, 1996). For example, transaction-specific capital may include investments in particular ICT infrastructure which are not going to be used in other, apart with the dominant enterprise, transactions. Information asymmetries refers to the optional sharing of only one part of the information available and deteriorating thus the full picture of the business market (demand and sales statistics etc.). Finally, there is the risk of loss of resource control where technical expertise and know-how information may be transferred to the dominant enterprise.

Operating in a network

Benefits arising from entering a network are mainly related to the flexibility that characterises this structure, which enables enterprises to join a partnership without deteriorating their future options, since after the completion of the project enterprises can decide their future actions. Given, membership is also not always required companies may optionally decide which situations are of economic importance for them and which are not. The opportunities that exist in this stage are mainly related to the exploitation of opportunities as they arise, avoiding formality and avoiding adding “friction” to the processes. The requirements in order catch the benefits and the opportunities are strongly related to those investments needed which will enable the interoperability of enterprises and the undistorted information sharing and exchanging. Standards to be used must be network-wide agreed. Transaction risks as those described in the chain formation still exist. In addition, there are risks related to the incompatibility problems that may arise in the ICT systems used, as a result of the “switching-partner” nature that often networks have.

Operating in a cluster

The main benefit from clusters arises from the proximity of all related industries and availability of resources. This minimises to a great extent transaction costs, as those described by Williamson (1975; 1991), both “ex ante” costs of preparing the transaction (e.g. find the appropriate supplier) and “post ante” costs of monitoring transactions (e.g. monitoring specification, standards etc.). The opportunities exist are mainly related to the capacity, to diversify products and processes, that a company generates in the effort to respond to the increased level of competition. Essentially, clusters formation drives specialization and diversification. The requirements are to a great extent driven by the opportunities. In particular, an innovation and competition culture is needed to the company which implies well-skilled workforce. The risks associated to cluster formation are to a great extent linked to the geographic, indefinite and temporal dimensions that they have. For example, the geographic character of clusters raises “tragedy of commons” issue, where certain risks arise from the common use of common resources which are of limited supply (Hardin, 1968; Hardin and Bader, 1977). Regarding the indefinite and temporal dimension of clusters, there are risks hidden in the disuse of product or services which a cluster produces, caused by changing consumer behaviours and preferences.

Conclusions

In today’s competitive environment collaborating with other enterprises has become absolutely vital for everyone but not necessarily a panacea. Given, the importance of collaboration, the paper presented the individual enterprise, the chain, the network and the cluster collaborative practise and classified them according to a number of critical perspectives that arise in situations of collaboration. Next, an assessment of the aforementioned collaborative practises followed, which revealed that different benefits, opportunities, requirement and risks associated to each collaborative practise exist. As a result, the particular strengths that enterprises have, along with the industry sector where it operates will be the two factors that need to be taken into consideration.

For example, if the SME operates in a very fragmented and competitive market, as the agri-food industry, which is characterised by relatively low levels of product innovation and diversification, probably a chain collaborative practise will be needed with the aim of assuring existence in the outcome of better future expectations. Analogously, in other industries different collaborative practises may be needed. This is a challenge for future research to present practical examples where specific collaborative practises have worked in specific industry sectors.

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FIGURE CAPTIONS

Figure 1: Classification of collaborative practises

Figure 2: Classification of collaborative practises according to benefits, opportunities, requirements and risks

FIGURES

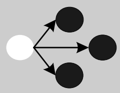
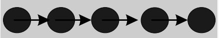
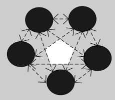
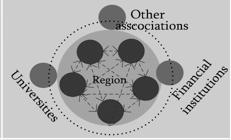
COLLABORATIVE PRACTISE / PERSPECTIVE	INDIVIDUAL ENTERPRISE 	CHAIN 	NETWORK 	CLUSTER 
TIME	Temporary (ephemeral relationships)	Mainly long-term (stable relationships)	Mainly short/mid-term (project based and dynamic relationships)	Indefinite and indeterminate
MEMBERSHIP	None	Very often, full required	Sometimes, partial required	Not required
MANAGEMENT CONTROL	Enterprise	Dominant enterprise	Equally shared-Dominant or majority of enterprises	Enterprise
DRIVERS FOR AGREEMENT	Power assymetry	Mutual arrangements (driven by dominant enterprise)	Mutual arrangements (equal basis or driven by dominant or majority of ent.)	Social norms and reciprocity
MAJOR OUTCOMES	Autonomy	Reducing uncertainty & improving performance	Switching partner capacity & shared resources	Information & knowledge sharing (Increased innovation capacity)
SHARED BUSINESS GOALS	Occasionally & opportunistically	Balanced between members	Task or project driven	Not required
TECHNOLOGY (ICT APPLICATIONS)	Not necessary (work-office automation)	Necessary to improve logistic processes (EDI applications)	Constitutive (central repositories-electronic markets)	Not necessary but supportive (Shared databases)

Figure 1

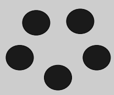
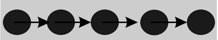
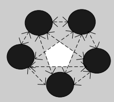
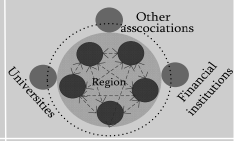
COLLABORATIVE PRACTISE / DIMENSION	INDIVIDUAL ENTERPRISE 	CHAINS 	NETWORKS 	CLUSTERS 
BENEFITS	Decision autonomy & better control	Assuring volumes	Flexibility (minimal mortgage of enterprise's future)	Resources availability-Transaction cost reduction
OPPORTUNITIES	Exploiting market conditions	Becoming indispensable to the dominant enterprise	Catch opportunities as they arise	Increasing diversification & competition ability
REQUIREMENTS	Vigilance	Following norms & standards imposed by dominant enterprise	Increased interoperability capacity	Innovation & competition attitude-highly qualified personnel
RISKS	Turbulent environment & opport. behavior	Transaction risks	Transaction risks-Compatibility failures	"Tragedy of commons" - temporal dimension

Figure 2