

Encyclopedia of Networked and Virtual Organizations

Goran D. Putnik
University of Minho, Portugal

Maria Manuela Cunha
Polytechnic Institute of Cávado and Ave, Portugal

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Concept of Collaboration

Luis M. Camarinho-Matos

New University of Lisbon, Portugal

Hamideh Afsarmanesh

University of Amsterdam, The Netherlands

INTRODUCTION

Although everybody has an intuitive notion of what collaboration is, this concept is often confused with cooperation. For many people, the two terms are indistinguishable. Even when a distinction is made, there are many different uses of the term *collaboration* in the current literature. The ambiguities reach a higher level when other related terms are considered such as networking, communication, and coordination (Denise, 1999; Grosz, 1996; Himmelman, 2001; Pollard, 2005). Although each one of these concepts is an important component of collaboration, they are not of equal value; neither one is equivalent to it.

BACKGROUND

In an attempt to clarify the various concepts and synthesize the various perspectives found in the collaborative networks literature, the following *working definitions* (Camarinha-Matos & Afsarmanesh, 2006) are proposed:

Networking: Involves communication and information exchange for mutual benefit.

A simple example of networking is the case in which a group of entities share information about their experience with the use of a specific tool. They can all benefit from the information made available/shared, but there is not necessarily any common goal or structure influencing the form and timing of individual contributions.

Coordinated networking: In addition to exchanging information, it involves aligning/altering activities so that more efficient results are achieved. Coordination, that is, the act of working together harmoniously, is one of the main components of collaboration.

An example of coordinated activities happens when it is beneficial that a number of heterogeneous entities share some information and adjust the timing of, for example, their lobbying activities for a new subject in order to maximize their impact. Nevertheless, each entity might have a different goal and use its own resources and methods of impact creation.

Cooperation: Involves not only information exchange and adjustments of activities but also sharing resources for achieving compatible goals. Cooperation is achieved by division of some labor (not extensive) among participants.

A traditional supply chain based on client-supplier relationships and predefined roles in the value chain is an example of a cooperative process among its constituents. Each participant performs her part of the job in a quasi-independent manner (although coordinated with others). There exists, however, a common plan, which in most cases is not defined jointly but rather designed by a single entity, and that requires some low-level co-working, at least at the points when one partner's results are delivered to the next partner. And yet their goals are compatible in the sense that their results can be added or composed in a value chain leading to the end-product or service.

Collaboration: A process in which entities share information, resources, and responsibilities to jointly plan, implement, and evaluate a program of activities to achieve a common goal. This concept is derived from the Latin *collaborare* meaning "to work together" and can be seen as a process of shared creation, thus a process through which a group of entities enhance the capabilities of each other. It implies sharing risks, resources, responsibilities, and rewards, which if desired by the group can also give to an outside observer the image of a *joint* identity. Collaboration involves mutual engagement of participants to solve a problem together,

which implies mutual trust and thus takes time, effort, and dedication.

A collaboration process happens, for instance, in concurrent engineering, when a team of experts jointly develops a new product. From this example, it can be noticed that although some coordination is needed, collaboration, due to its joint creation facet, involves seeking divergent insights and spontaneity and not simply a structured harmony.

As presented in the given definitions and depicted in Figure 1, each of the above concepts constitutes a “building block” for the next definition. Coordination extends networking; cooperation extends coordination; and collaboration extends cooperation.

As we move along the continuum from networking to collaboration, we increase the amounts of common goal-oriented risk taking, commitment, and resources that participants must invest into the joint endeavor. In the rest of this article, we focus on collaborative networks which subsume all other forms.

Even with these definitions, in practice, the distinction between collaboration and cooperation is not always very clear. In fact, in a collaborative network, collaboration in its strict sense does not happen all the time. For example, in the manufacturing alliances, very often there are phases of intense collaboration, for example, design and planning phases of a project, intermixed with periods when the participants work individually and independently on their assigned tasks. Then, from time to time, they “come together” (physically or virtually) to integrate their results and continue the joint problem solving. Therefore, a collaboration process clearly involves periods of only cooperation.

Understanding and supporting collaboration, which is the most demanding joint endeavor, also leads to understanding and supporting the other less demanding forms of interaction.

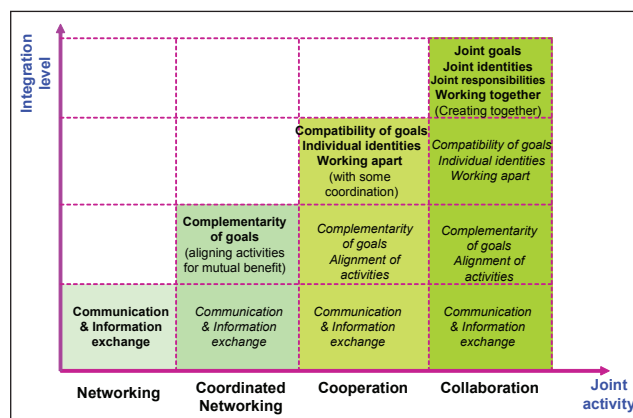
In collaboration, parties are more closely aligned in the sense of “working together” to reach the desired outcome, rather than that outcome being achieved through “individualistic” participation constrained by contextual factors such as those imposed by client-supplier relationships.

REQUIREMENTS FOR COLLABORATION

Collaboration is a difficult process and thus the chances for its success depend on a number of requirements:

- Collaboration must have a *purpose*, usually translated to a joint goal or problem to be solved. It is not enough that parties have their own individual goals.
- *Basic requirements* or preconditions for collaboration include (Brna, 1998; Giesen, 2002):
 - Parties mutually agree to collaborate, which implies accepting to share.
 - Parties keep a model of each other’s capabilities.
 - Parties share a goal and keep some common vision during the collaboration process towards the achievement of the common goal.
 - Parties maintain a shared understanding of the problem at hand, which implies discussing the state of their progress (state awareness of each other).

Figure 1. Examples of joint endeavor



Sharing involves shared responsibility for both participation and decision making, shared resources, and shared accountability for the outcomes, both in terms of rewards and liabilities, as well as mutual trust. However, we shall notice that sharing does not imply equality. Different parties might have different “amounts” of involvement according to their roles.

- As a *process*, collaboration requires setting a number of generic steps (Giesen, 2002):
 - Identify parties and bring them together.
 - Define the scope of the collaboration and define desired outcomes.

Concept of Collaboration

- Define the structure of the collaboration in terms of leadership, roles, responsibilities, ownership, communication means and process, decision making, access to resources, scheduling, and milestones.
- Define the policies, for example, handling disagreements/conflicts, accountability, rewards and recognition, and ownership of generated assets.
- Define the evaluation/assessment measures, mechanisms, and process.
- Identify risks and plan contingency measures.
- Establish commitment to collaborate.
- Collaboration requires a “*collaboration space*,” that is, an environment to enable and facilitate the collaboration process. The characteristics and nature of this “space” depend on the form of collaboration. Collaboration can take place at the same time (*synchronous collaboration*) or at different times (*asynchronous collaboration*). It may also occur in the same place (*collocated collaboration*) or in different places (*remote* or *virtual collaboration*) (Winkler, 2002).
- Some major points of difficulty in collaboration include (Wolff, 2005) resources, rewards, commitments, and responsibilities:
 - **Resources:** Ownership and sharing of resources is a typical difficulty, whether it relates to resources brought in by members or resources acquired by the coalition for the purpose of performing the task.
 - **Rewards:** Finding a fair way of determining the individual contributions to a joint intellectual property creation is a rather challenging issue. Intellectual property creation is not linearly related to the proportion of resources invested by each party. At the very base of this issue is the need to reach a common *perception* of the exchanged values, which requires the definition of a benefits model and a system of incentives, based on a common value system.
 - **Commitments:** Whenever there is an attack or any other obstacle to the collaboration, do parties respond as a whole, facing the consequences together, or does each one try to “save its neck”?

- **Responsibilities:** A typical phenomenon in collective endeavors is the dilution of responsibility. A successful collaboration depends on sharing the responsibilities, both during the process of achieving the goal and also the liabilities after the end of the collaboration.

Therefore, all these issues must be settled by a set of common working and sharing principles.

In spite of the difficulties of this process, the motivating factor is the expectation of being able to reach results that could not be reached by parties working alone.

COLLABORATION AND COMPETITION

To better understand collaboration, it is also useful to put it in contrast with competition. Competition has been seen, historically, as one of the most successful basic mechanisms used by entities in the struggle for survival, namely in the case of scarce resources. It is interesting to note that even economics is defined as the study of “the efficient allocation of scarce resources among competing uses,” and politics is understood as “the relations between special interest groups competing for limited resources” (Kangas, 2005).

In fact, the formation of cooperation and collaboration alliances has emerged to allow more efficient competition against other entities or groups. This is typically what leads small- to medium-sized enterprises (SMEs) to join efforts in order to survive in turbulent markets. Also, in nature, we find natural alliances that compete with others for survival—the species (Kangas, 2005). The stronger the threat, the higher the internal cohesion and sense of group identity.

But even inside a friendly group, we often find the interplay between collaboration and competition. Internal competition happens as the means to gain more power, status, or material resources. On the other hand, if we consider the creative facet of collaboration—creating together—we can also find the interplay among the two concepts (Denise, 1999). In fact, innovation very often results from healthy confrontation of different ideas and perspectives. A fruitful collaboration space shall allow for some degree of divergence. Often enough, creativity is resulted from challenges to the current directions, norms, or assumptions. It is however

fundamental that such divergences do not undermine the basic foundations of the group cohesiveness, such as trust, fairness, and sharing.

Finding the right balance between collaboration and competition in order to not only efficiently react to external threats or opportunities but also to excel individual capabilities and breed innovation is a major challenge for the definition of the governance policies, working/sharing principles, and supporting tools and infrastructures for collaborative networks.

FUTURE TRENDS AND CONCLUSION

With the fast development of the area of collaborative networks, showing in a diversity of application domains, it is becoming crucial to systematize and consolidate the knowledge in this area. Although many past research projects had important contributions in terms of exploiting new approaches and technologies, they had a mostly ad-hoc nature. The challenge for the near future is to elaborate a sound theoretical foundation for collaborative networks (Camarinha-Matos & Abreu, 2003; Eschenbaecher & Ellmann, 2004). Such a foundation will allow a more consistent development of this new scientific discipline (Barabási, 2002; Camarinha-Matos & Afsarmanesh, 2005). Some recent projects such as THINcreative and ECOLEAD have contributed in this direction (Camarinha-Matos & Afsarmanesh, 2004; 2006b). The attempt made in this article to clarify some of the base concepts shall be seen as a contribution to this very much needed systematization effort.

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KEY TERMS

Networking: Consists of establishing connections among people or organizations through ICT networks for communication and exchange of information.

Coordinated Networking: The act of working in joint harmony through the alignment of activities in order to achieve more efficient results.

Cooperation: Working apart in complementary activities but with some coordination and information

exchange towards the achievement of compatible goals; it might involve some resources sharing.

Collaboration: Working together/creating together towards the achievement of a joint goal, that is, a process in which participating entities share information, resources, and responsibilities to jointly plan, execute, and evaluate a program of activities to achieve a common goal.

Collaboration Purpose: A joint goal or problem to be solved in collaboration.

Collaboration Requirement: A precondition for collaboration.

Collaboration Process: A number of generic steps of collaboration.

Collaboration Space: An environment to enable and facilitate the collaboration processes.

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