

# VARIOUS KINDS OF NETWORKS OF PARTNERS: A PROPOSAL FOR A CLASSIFICATION SCHEME

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In order to be competitive in the current industrial context, companies need to refocus their efforts on key activities and skills where they have an edge over competitors. For all the component parts of their overall performance, they must support close relationships with other firms. In this paper, we present and characterize the various organization modes allowing companies to assemble. Furthermore, we propose a classification of network-based organization modes.

*Keywords:* Network, Design, Learning, Innovation, Organization.

## 1. INTRODUCTION

In recent times, firms have come to the realization that they do not hold sufficient time or financial resources to ensure global control over all the components in their value chain. They must therefore refocus their efforts on key activities and skills, where they are sufficiently set apart from the remainder of the market. For some component parts of the overall service they provide to clients, they must foster close relationships with other firms, lest they not be able to fully take advantage of their excellence functions. Because of limited resources and increased system complexity, they can no longer achieve this on their own; regrouping is essential.

In this paper, we begin by presenting four modes of firm organization described in related literature, namely: market-based, bureaucracy-based, clan-based and network-based. These concepts may be distinguished based, firstly on the nature of the relationship (collaborative or not), secondly on the presence or absence of hierarchical bonds. Networks, which can be characterized as coordinated systems of heterogeneous actors who develop transactions based on cooperative relationships, in order to jointly pursue a shared goal. Networks appear to be a preferred mode of organization to help firms, operating according to different rationales, to cooperate with each other in a non-hierarchical setting, centered on a unifying project. Furthermore, they seem to be an intermediate form of organization, a half-way stop between cooperation and competition. Indeed, firms partnered in some projects may, in such a framework, remain competitors in other markets. In the first part we also propose a structural model of a network of partners, including actors, activities, and resources. This model is based upon the relationships between interconnected actors. We identify three types of relationships, namely activity links, resource ties and actor bonds.

Having identified the general characteristics of a network-based organization, we then describe various subtypes of this kind of organization. Indeed, an analysis of related literature leads us to

the conclusion that inter-firm bonds cover, in fact, a large number of organization types ranging from long-lasting customer-supplier partnerships, to the creation of independent legal entities such as joint ventures. We thus identify more than ten subtypes of network-based inter-firm bonds, namely: associations, partnerships, alliances, extended firms, joint firms or joint ventures, consortium, knowledge communities or technological clusters. In the second part, we describe these main types of networks in detail.

Having characterized various types of network-based organizations, we then propose a classification scheme based on common criteria. This scheme is based on three criteria, each defined following two levels: the type of arrangement between partners, the type of process used for collective work. This allows us to set apart four kinds of network-based organizations. Real-world examples are given for each of these.

## 2. FOUR ORGANIZATION MODES

Based on a review of the literature, four modes of firm organization can be singled out. Indeed, Jarillo [1] broadens the concept of market, bureaucracy and clan, introduced by Ouchi [2, 3], to include the concept of *network*. These concepts may be characterized, on the one hand, based on the nature of the relationship between firms (cooperative or not) and, on the other hand, based on the presence or absence of hierarchical bonds [1]. Table 1 illustrates and characterizes these organization modes.

**Table 1.** Four organization modes [4].

	Non-cooperative	Cooperation
Non hierarchical organization mode	Market	Network
Hierarchical organization mode	Bureaucracy	Clan

Within the scope of this paper, market and bureaucracy, which are non-cooperative organization modes, do not capture our interest in the need for members from different companies to cooperate with each other. Market operation is based on a pricing system, and the price of goods contains all relevant to the equity of a transaction. Bureaucracy, however, implies recognition of a legitimate authority to influence the strategic orientations of the company. Furthermore, for a hierarchy to exert command, as in the case of a bureaucracy or clan, strongly inhibits learning processes and slows change [5]. Indeed, this stifles creativity, reflection, initiative, motivation, and exerts, overall, a negative effect on individual performance. Therefore, these three modes of organization (market, bureaucracy and clan) are not suitable to fostering learning within a cooperative relationship.

Networks, however, characterized as a coordinated system of heterogeneous actors, developing transactions based on cooperative relationships in order to collectively pursue a shared goal [6], seem to be a preferred mode of organization for this, allowing cooperation between firms with differing logics, within a non-hierarchical structure focused on a federating project. In addition, networks are viewed as an intermediate form of organization, a compromise between cooperation and competition [7]. Indeed, partners engaged in specific projects can also remain competitors on other markets.

## 3. NETWORKS

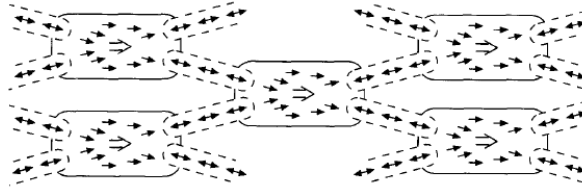
The structure of a network of partners, comprising actors, activities and resources, has been defined in the model proposed by Hakan Hankansson et Ivan Snehota [8, 9].

*Actors* are located at various hierarchical levels. This expression can refer to individuals, groups of individuals, structures within the company, the whole company itself, or even groups of companies. Five key characteristics are used to define actors, namely: execution and control of company activities, exchanges with other actors, activities based on resources (directly, or indirectly via relationships between actors), being goal-driven, and having knowledge different to other actors (regarding actors, activities and resources) [9].

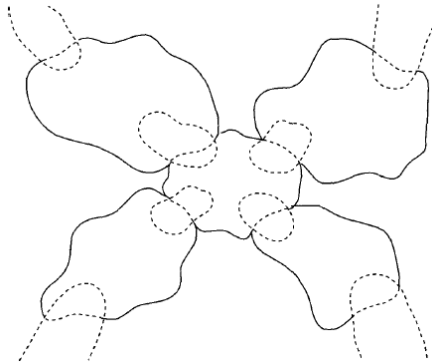
*Activities* occur when one or more actors develop, exchange, or create resources by using other resources. Two main kinds of activities can be set apart, namely: transformation activities, most often controlled by an actor, which involve transforming a resource in a set way; and transfer activities, which involve transferring a resource without it being transformed, to another actor [9].

*Resources* are heterogeneous and under the held by one or more actors. They can be characterized using three main attributes: actors controlling the resource, use of resources for an activity, and flexibility of resource use [9].

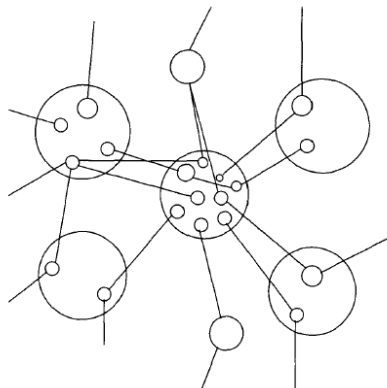
One noteworthy aspect of this model is its focus on relationships between interrelated actors. Three main kinds of links are identified: *activity links* (Figure 1), *resource ties* (Figure 2) and *actor bonds* (Figure 3).



**Figure 1.** Activity links [8].



**Figure 2.** Resource ties [8].



**Figure 3.** Actor bonds [8].

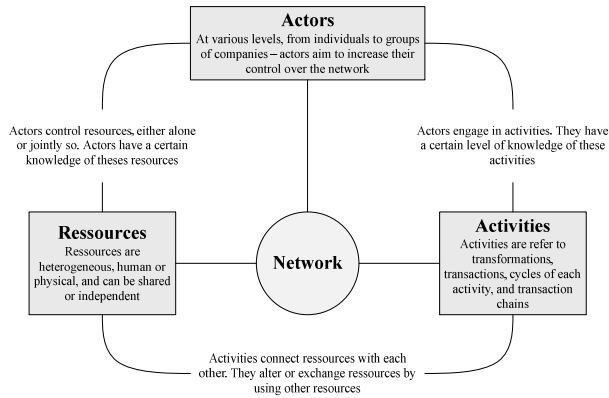


Figure 4. Network structure according to [9].

These links allow a comprehensive description of the relationships between actors and companies (Figure 4).

Having identified the main characteristics of network-based organization, we describe the various kinds of network organizations present in the literature.

#### 4. VARIOUS KINDS OF NETWORK ORGANIZATIONS

Eight types of network organizations are presented in the literature.

##### 4.1. Associations

Association refers to a specific contract in private Law, defined by statutes, and compulsorily specifying physical headquarters, the goal or objectives of the association, as well as the means to achieve this goal. Article one of the French Law regarding this type of organization, enacted on July 1st 1901, defines an association as “a convention whereby two or more persons share knowledge or activities on a permanent basis, with a goal other than sharing benefits. The validity of this association is governed by the general principles of the Law pertaining to contracts and bonds”. Associations are groups of people united in common design, with non-lucrative aspirations. For example, the French Association for Mechanics (AFM), created in 1997 through the association of 17 scientific and industrial societies specialized in the various fields of mechanics. It is a network for information, exchange and reflection for the mechanics community: executives in the industry and transfer structures, teachers, and researchers.

##### 4.2. Partnerships

Partnerships provide firms with access to extraneous knowledge, derived from constructions inscribed within singular trajectories. Cognitive distance between partners characterizes a partnership and determines the possibilities for learning that may arise from cooperation. The more this cognitive proximity is prevalent, the fewer the possibilities for learning and access to original knowledge for any of the partners.

A partnership usually alludes to an approach aiming to coordinate actions, flows of goods and services along a value chain, etc. of legally independent organizations involving a client and supplier [6]. Thus, companies are not in direct competition with one another, as in the case of a union [10].

For example, GDF SUEZ united with the International Union for Conservation of Nature (IUCN), the largest environmental organization worldwide, as part of a large partnership:

- The French committee of IUCN assists GDF SUEZ in taking into account biodiversity when defining product activities (organizing training venues), while

- GDF SUEZ provides financial support for the French committee of UICN's projects, e.g. updating a list of endangered species.

### 4.3. Unions

Inter-company unions are an intermediate form of organization between cooperation and competition. A union is a bond willingly formed between several sovereign (*i.e.* autonomous centers for strategic decision-making, which do not belong to the same group) and competing firms [10]. It is characterized by the sharing, between at least two companies, of a fraction of their resources (*i.e.* material and immaterial assets) to pursue joint goals within a given space and to obtain reciprocal benefits. Although there is a relation of interdependency in a specific field, union members remain autonomous outside of the scope of this cooperation [5].

Unions are defined as cooperation agreements with little or no formal commitment [7]. However, a union does imply a contract — explicit or tacit, written or oral — between partner firms. In some cases, to generate a moral entity distinct from the partner companies, union members create a specific legal entity termed a joint venture.

When partners pool together a fraction of their resources, the nature of their contributions conditions the type of joint activity they can engage in. Two union archetypes exist, such as to be complementary: endogamies (between companies of similar profiles) and exogamies (between companies of contrasting profiles). In the first case, partners seek to increase in size; in the second, the goal is to achieve complementarity and crossbreeding effects [11].

For example, Renault and Nissan united in March 2009, allowing them to build a powerful automotive group, and develop synergies whilst preserving the culture and identity of each brand. One example of benefit arising from this union is the pooling of expertise and sharing of technology. Nissan currently drives the development of new fuel-based engines, whereas Renault is in charge of developing diesel engines.

### 4.4. Extended companies

Extended companies can be defined as sets of partnered, similar or dissimilar agents which share complementary resources and skills to cooperate and maximize shared objectives. An extended company generally comprises two types of agents, namely:

- Partner agents — subcontractors, providers of services or goods, experts, etc. — working in a close bond of cooperation, in design, manufacturing or distribution activities, with a partner firm;
- Cooperating agents, *i.e.* a company heading the network and driving cooperation between its various partners.

Extended companies therefore rely on the existence of a cooperating agent, who ensures, via diagonal cooperation, efficient relations between all the partner agents within an extended company. Most of the time, this type of organization is the result of a decision by the company to externalize, on a cooperative basis, some of the activities it has no interest or means to pursue itself, for example in the case of a company wishing to refocus itself on a core activity in order to remain competitive. Extended companies, which usually function on the basis of unions and partnerships, also allows companies to regroup and carry out large-scale projects which would be impossible to do for individual companies.

For example, in setting up the Micro Compact Car (MCC) factory, a subsidiary of DaimlerChrysler, in charge of developing “Smart” urban vehicles, in Hambach, France, the factory was designed to house within the same site, the automotive constructor with its key partners.

### 4.5. Shared companies, co-companies and joint ventures

These three terms refer to a shared and specific project for which two or more companies have elected to band together. Share ownership is variable, and can be equal or unequal. Such structures, often

having a limited lifespan, allow partners to pool their respective expertise (knowledge, technology, resources) to carry out an industrial project whose goals would be difficult to reach by individual companies. When creating a shared company, it is crucial to provide in its statutes, exit procedures for each of the parties involved.

For example, Thalès Alenia Space, world leader in terms of orders and European leader in the construction of satellites and orbital infrastructure, is a Franco-Italian joint venture, 67 percent of which is owned by Thalès (France), and 33 percent by Finmeccanica (Italy).

#### 4.6. Consortiums

In a consortium, actors with differing backgrounds and perspectives pool their knowledge to work together on the same project, most of the time a research project. Members can be research laboratories or organisms, companies (large industrial groups, SMEs) or institutes for higher education. The goal of a consortium is to coordinate and animate all of the partners' contributions to the consortium (specificity, knowledge, financial, technical, and human resources, or perception of the research project) in order to jointly carry out a research project. In addition to trust between partners, operating rules must be defined within a "consortium agreement". This agreement must be carefully negotiated, and aims to clarify role distribution, industrial property issues, etc. It is signed by all partners at the start of the project.

Consortiums thus constitute a means for the partners to reach a critical size, to benefit from the background and knowledge of the partners, as well as from skills whose external acquisition would be very costly. It also allows optimization of the contributions of all parties, as well as to remain open to other approaches of the same problem, and to explore new courses of action.

For example, the World Wide Web Consortium (W3C) is an international consortium comprising over 400 members worldwide (IBM, Cisco, Nokia, CERN, Oxford University) whose goal is to develop standards for the web.

#### 4.7. Knowledge communities

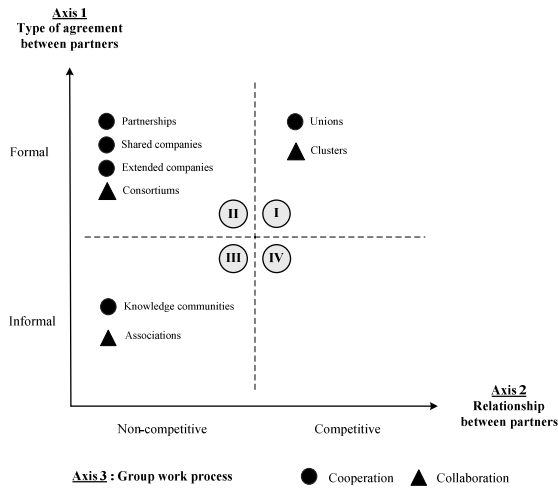
A knowledge community can be defined as "an informal group (distinct from formal groups such as functional groups or project teams) or members with the following properties:

- Member behavior stems from a voluntary commitment in constructing, exchanging, and sharing a repertoire of shared cognitive resources;
- Through their practices and repeated exchanges, members of a given community gradually construct a shared identity;
- Survival of the knowledge community is ensured by upholding a set of social norms which are specific to the community" [12].

The literature describes several kinds of knowledge communities, some of which are:

- Epistemic communities, referring to small groups of agents whose common goal is the creation of new knowledge, and who share a common framework allowing this activity to be jointly carried out [13, 14]
- Communities of Practice [15], which refer to small groups of agents who share a set of practices and regularly communicate with each other on their activities. The goal is to accumulate knowledge and increase skill in a specific practice. Indeed, members share "best practices" with one another [16]. The concept of communities of practice therefore alludes to the process of social learning which arises when individuals with a common interest collaborate with each other.

For example, Hewlett Packard's Learning Groups, British Petroleum's Peer Groups, or the Knowledge Networks of IBM global services are informal groups gathering members of an organization around specific fields of knowledge.



**Figure 5.** Classification of the very types of network organizations.

#### 4.8. Clusters

Michael Porter [17], a professor at Harvard University, drew inspiration from the theory of competitive advantage to suggest the concept of competitive clusters, which gather, in the same geographical area and in a specific field of activity, a critical mass of resources and skills: companies of various sizes, public and private research laboratories, which give the area a key position in the economic competition worldwide. Porter defines clusters as “groups of companies and institutions associated in a common field, geographically near from one another, and bound to one another by common as well as complementary attributes [17, 18].

Studies into the organization of socioeconomic networks and phenomena such as spatial conglomerations have given rise to two other concepts, *i.e.* company clusters and industrial districts. We note that these three expressions relate to the same concept, *i.e.* coherent groups of companies and research laboratories from a specific field, concentrated in the same geographical area.

For example, the Silicon Valley, located in the suburbs of San Francisco, California [19], is a cluster of over 6000 companies in the fields of semiconductors and computing (e.g. Apple, Hewlett Packard, Sun Microsystems, etc.)

### 5. A CLASSIFICATION OF VARIOUS NETWORK-BASED ORGANIZATION TYPES “NETWORKS”

Having identified and characterized various network-type organizations from the literature, it now seems an interesting venture to classify these using common criteria. Three such criteria, defined on two separate levels, can be used:

- The type of agreement between partners: formal or informal
- The relationship between partners: competitive or non-competitive
- The group work process: cooperation or collaboration.

Four modes of network organization can be set apart in this classification scheme (Figure 5).

The first group relates to a competitive relationship with a formal agreement. Competing partners wish to pool together a fraction of their material or immaterial resources to benefit from increased size or complementarity. To avoid any opportunistic behavior, an agreement is signed between the partners. The opportunity to complete a project whose goals would be difficult to reach individually, motivates the partners to band together. Mutual benefits are obtained. Such network-type organizations present

partners with an opportunity to carry out a project where each partner provides his own resources to the whole. Learning or technological transfer are not sought after in these organizations.

The second group combines a non-competitive relationship with a formal involvement. Several members with different backgrounds and perspectives share a common goal. Belonging to different fields of activity, as well as making a formal agreement, allow knowledge and experience to be shared in a risk-free environment. These two characteristics seem to define an environment that is particularly conducive to learning between members with distinctive knowledge and experience. Consequently, this environment may be more favorable to innovation.

The third group refers to the “non-competitive relationship”/“informal agreement” dyad. Members unite in order to pool knowledges and activities related to a specific topic. The absence of competition between partners allows creation of informal groups based on voluntary participation. Such structures never appear in any flowchart. Learning is at the center of such structures. However the lack of formal commitment restricts exchanges regarding confidential topics.

Finally, the fourth group — competitive relationship with an informal agreement — comprises no structures. In our review of the literature, this does not seem to be a viable configuration partners to form groups in. With no formal document such as a contract or other agreement, partners, who are also competitors of one another, engage in high-risk exchanges in terms of intellectual property and company strategy. Indeed, no suit could be filed in the case of a commercial use of stolen resources by unauthorized parties. In such a relationship, possibilities for mutual learning are dampened by a mutual distrust between partners.

## 6. CONCLUSION

In order to increase their efficiency, it therefore seems reasonable for firms to regroup, to pool specific resources together, to jointly support incurred costs, in order to benefit from increased size, but also from complementary know-how, so as to develop skills in each individual firm. We therefore chose to focus our work on network-based organizations, and proposed a classification scheme for the complex forms these may take.

This classification should allow companies wishing to regroup to choose the type of organization most relevant to the direction they wish to take to develop new working relationships.

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