

# Multi-Organizational Structures

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## Abstract

This paper presents a typology of multi-organizational structures that emerge from the interaction of several organizations or are deliberately created by them. Common in political, military, and business worlds, these inter-organizational partnerships create compositional structures which are controlled by several organizations. Multi-organizational structures offer a very interesting framework for the study of the costs and advantages of cooperation. It is shown that these structures can be characterized in terms of three features, which are purpose of partnership, control and cooperation structure, and dynamics of membership. Implications of each organizational structure on its autonomy and performance are discussed.

## Introduction

Among the large body of research on organizations in social sciences and multi-agent systems (Weiss 1999), we can situate this work as an organization-oriented approach to multi-agent systems, which studies structures that result from the partnership of two or more organizations. We have called these Multi-Organizational Structures (MOS). A typology of MOS is presented, illustrated by real-world schemata found in political, military, and business worlds. Human organizations have been used as a basis for the analysis and the design of multi-agent systems (Argente, Julian, and Botti 2006). MOS, we believe, provide a very interesting framework for the study of the cost, advantages, and mechanisms of cooperation, which is a central topic in multi-agent systems.

The paper is organized as follows. After defining the context and our motivation for the study of organizations, we discuss the factors that lead to organizational partnerships, both in the case of emergent and deliberately created MOS. Next, a minimal set of features is identified for their characterization, including *purpose of partnership*, *control and cooperation structure*, and *dynamics of membership*, which captures the different and yet related dimensions of multi-organizational partnership. A typology of MOS is then presented and characterized in terms of these features. The typology includes *networks*, *tacit agreements*, *coordinating units*, *consortia*, *coalitions*, *alliances*, and *unions*. Fi-

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nally, we conclude by discussing the balance between autonomy and performance in MOS.

## Problem statement

Our interest in organization studies and the field of multi-agent organizations started with a study on teamwork in military coalitions. Current thinking in military forces seeks to enable information superiority through the tight collaboration of military entities. Hence, the importance of the analysis, and the modelling and simulation of both teamwork and organizational structures that can effectively support it (see (Dekker 2006; Leedom and Eggleston 2005)).

Given the nature of today and future conflicts, military units will be increasingly called to cooperate in joint or combined operations, as part of Multi-Team Systems (MTS). Marks et al. (Marks et al. 2005) define MTS as “a tightly coupled network of teams, the component teams of which are distinguishable entities capable of independent actions and that may pursue different proximal goals. Their efforts are however tied together by a sequential goal hierarchy demanding quality transitions from one to the other, all in pursuit of an ultimate goal”. Teams themselves can be defined as a “collection of individuals who share a common goal, whose actions and outcomes are interdependent, who are perceived by themselves and others as a social entity, and who are embedded in an organizational context” (Devine 2002). Because they are constitutive of organizations, teams have performance goals, a feature that differentiates them from groups or communities.

Multi-team systems are formed when existing teams are called upon to collaborate to meet some emergent situation which no single team can effectively deal with. Inter-team collaboration can occur within a single organization, as occurs as a matter of course when army, navy and air forces collaborate in joint operations. It also occurs in a multi-organization form when a number of emergency measures organizations, such as various police and fire-fighting forces, collaborate to deal with a particular situation. Coalitions are still another form of MTS, where each team is attached to a different organization. As such, coalitions face some challenges, which led us to compare them with other types of inter-organizational partnership.

This study attempts to show how certain related features shape the dynamics of an organization and determine

its cooperation potential and the performance that can be achieved through this cooperation. The organizations/multi-organizations relationship is not an extension of the agents/organizations one. Although organizations in MAS can be defined in very abstract terms, as ‘a collection of roles, relationships, and authority structures which govern its behaviour’ (Horling and Lesser 2005), we have to understand organizations in this context as social entities with high-level goals, high-level interests, a governance system, and global strategies.

### Multi-organizational structures

Multi-Organizational Structures (MOS) are new organizations or arrangements that result from the partnership of two or more organizations. MOS, which we situate somewhere in the middle of two extremes (no organization, one single integrated organization), may be emergent or planned.

1. Emergent (unsupervised): As new objectives are sought and new interests come about, inter-organization interactions are harnessed, leading to the creation of new organizations. This is the process leading to the creation of networks, communities of interest, communities of practice (Wenger 1998) or other sketches of more formal and explicit organizations. These emergent MOS are more defined by knowledge sharing than by task, roles and authority/command/control, or coordination structure. People within or across organizations discover commonalities and explore the benefits of networking.
2. Planned (supervised): In a competitive, challenging, and constrained world, existing organizations may want to increase their resources to achieve short or long-term objectives. This can bring them to collaborate with other organizations. New organizational paradigms are then created to respond to new needs, to satisfy new constraints or to seize new opportunities.

Planned MOS require from members a commitment to joint activity (Jennings 1993), while emergent ones do not. Among the MOS to be presented here, *networks* and *tacit agreements* are emergent, while all the others are planned. There are both advantages and risks associated to the diverse forms of partnerships. These will be evaluated as we characterize each MOS in terms of our set of features.

### MOS defining features

This section presents the three defining features that were identified as the most important ones, along which organizations, and MOS, in particular, can be defined. These features are: (i) Purpose of Partnership (PP); (ii) Control and Cooperation Structure (CCS); and (iii) Dynamics of Membership (DM), each of which comprises several dimensions. A systematic use of this set of features allowed us to distinguish different types of MOS, but we do not claim that they are either necessary or sufficient. In fact, the study of taxonomies of teams and groups has shown us that defining features are often determined by the context in which these entities are observed and the research interests of the observers. Our interest in command and control structures and cooperation

have led us to consider features that are relevant for these aspects.

### Purpose of Partnership (PP)

Organizations can be predominantly characterized in terms of purpose. The purpose defines the *raison d’être* of the organization (or the MOS); the reason for which it is designed (in the case of planned organizations) or the reason for which it is formed (in the case of emergent organizations).

In the specific case of MOS, the purpose refers to the *purpose of partnership*, which defines the set of high-level goals that motivate the deliberative creation of the MOS, or the reasons that induce certain patterns of interaction, leading to the emergence of a MOS. The purpose directly determines the other two features.

In the case of planned MOS, the purpose of a partnership can be motivated by the maximization of return on investment and/or the minimization of the cost of operations and/or the impact of operational constraints. As Horling and Lesser (Horling and Lesser 2005) formulate it (for coalitions), the motivation is that the value of cooperation may be “super-additive” along some dimension, and the costs “sub-additive”. Organizations that engage in these partnerships either cannot satisfy a given goal alone or can satisfy it but at a higher cost than if they did it in collaboration with other organizations.

With emergent MOS, no explicit common goal exists. Organizations come together, each for the satisfaction of its own goal. Although they are initially self-interested, in the course of their interaction, they discover commonalities, recognize potential, and eventually define joint goals. The organization can then move from a loose network to a tighter integration where a larger set of cooperative activities can be carried on.

The purpose, and the performance expected from the cooperation, shape and limit the number of acceptable forms of partnership. Conversely, having a given form of partnership will impose constraints on the performance goals that the MOS can achieve. The level of performance expected from tightly integrated MOS, will obviously exceed those expected from loosely defined ones. The statement can be generalized to planned versus emergent MOS. Planned cooperation is always associated with more critical goals and higher performance requirements.

The lifespan of a partnership in this context is directly related to its purpose. High-level, loosely defined, strategic goals will generally give way to long-term/permanent arrangements, while short/mid-term arrangements will be associated with more concrete, operational goals.

### Control & Cooperation Structure (CCS)

Control architectures aim at regulating control and coordination, and achieving global performance for the overall system in a given situation. The control structure determines the performance of an organization to the extent that it defines its authority structure; it affects task and resource allocation (MacMillan et al. 2002); it indirectly affects performance by influencing cooperative processes; and it defines

the external fit of the organization, that is, its adaptability to changing situations (Hollenbeck 2000).

In single organizations, the spectrum of control architectures covers a wide range of possibilities, from hierarchical to holonic to federated to heterarchical. Movement in any direction on this spectrum, from centralized to decentralized architectures or vice versa, implies a trade-off between oversight and efficiency, on the one hand, and local autonomy and operational flexibility, on the other.

In the MOS context, we talk of control and cooperation structure (CCS), given that performance is measured relatively to the cooperative activities. CCS comprises two dimensions, which are control structure and cooperative processes.

**Control Structure (C-Structure)** There are two aspects to control in MOS. One is relative to the mechanism used by organizations to conduct their common operations. Organizations can create a separate entity for their new conjoint activities, or cooperate/interact directly.

The other aspect concerns the control or governance of MOS. Given that they involve several organizations, MOS preclude centralized control structures that presume a single chain of command. MOS are constituted of autonomous and sovereign organizations that try to exploit a networked environment, and this entails the use of a decentralized architecture, where authority is shared among participating organizations. This can be done by means of an administration board, parallel command structure, turn-taking governance, etc. However, if a new entity is created, it may, as a new organization, have a centralized or hierarchical command, which can become problematic if reporting organizations retain too much control, as will be seen with coalitions.

Rather than the centralized/decentralized paradigm, control in MOS must be defined in terms of intensity of control (partial or full) of partner (reporting) organizations over the MOS, endowing it with more or less autonomy as a new organization.

**Cooperative Processes (C-Processes)** In the context of MOS, cooperation is always augmentative (Schmidt 1990), that is, the organization engaging in a MOS does so because it cannot do the task alone. This may be because of a lack of capacities, resources, legitimacy, etc. The type of cooperative processes in each MOS depends on the purpose of partnership, that is the overarching goal (if any) that unites the participating organizations, and their level of commitment. At the inter-organizational level we are interested in here, cooperative processes boil down to: (i) information sharing; (ii) coordination of activities; and (iii) resource sharing.

There is an implicit order between these processes. Sharing information on a network requires less commitment from the participants than coordinating one's activities with other agents or organizations. Altering one's activities can in turn seem less critical than sharing resources. But, there is also a degree within each category that can supersede this *a priori* order. Information can be more or less critical and resources can be more or less vital. Secret or confidential information (intelligence) can be more valuable than weapon resources. Also, one can engage in coordination at different

levels (Castelfranchi 1998), which do not imply the same costs or require the same commitments. One can simply avoid negative interference with the other (avoid to do him any harm), coordinate one's own actions as to profit from a favorable circumstance, facilitate the actions of the other, change one's plans as to help the other achieve his goals, or plan one's actions with the other as to create synergy.

### Dynamics of Membership (DM)

Dynamics of membership includes the general size, the number of participants and the membership conditions. This feature is not represented in the diagrams representing MOS (except for the number of participants), but is indicated for each of them in Table 1. Membership conditions, expressed in terms of open/closed and reversible/irreversible, are linked to the commitment of the participants to the partnership. Open membership means that new members can be admitted, often conditionally in planned MOS. 'Open' is generally associated to 'reversible', meaning that members can leave the MOS or revise their initial commitments. The general size refers to the elasticity of the MOS, expressed in terms of variable or constant. Finally, (+) and (++) indicate respectively a small/large number of participating organizations.

### Typology of MOS

In this section, we identify and represent the most common types of MOS and discuss their characteristics in terms of the above features. All diagrams include rounded boxes for organizations (greyed when interacting through a shared entity), orange ellipses indicating the scope of shared goal, full black arrows indicating full control of reporting organization, dotted black arrows indicating partial control of reporting organization, and grey boxes for cooperative processes, the type of which is indicated by IS, RS, AC, and FS for information sharing, resource sharing, activity coordination, and full spectrum (all the previous) respectively.

### Network ( $\mathcal{N}_W$ )

A network (Figure 1) is an arrangement where several organizations, driven by a common interest, share information for the mutual benefit of all. Members interact directly and as long as the network serves their interests.

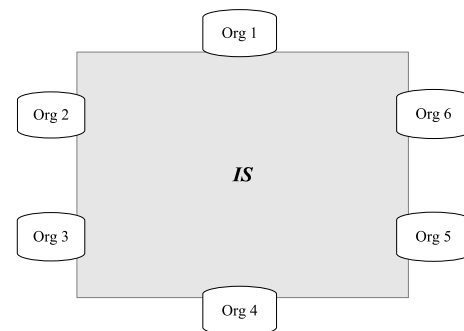


Figure 1: Network

The purpose for a network can be seen as a means to expand one's knowledge while minimizing effort. The knowledge and experience shared through the network is used by each organization for its own individual goal. The participants do not pursue a common goal and therefore one cannot talk of cooperation, but only of its superordinate concept, collective activity, where, in Hoc's words (Hoc 2001), there is interference management in real time without necessarily a common goal playing a regulation role.

There is no shared control over the MOS. Membership is open and reversible and the lifespan of the MOS is undefined. The participants have no commitment towards the organization or each other, and therefore preserve full autonomy. This and the type of cooperation (IS) explain the large number of participants and the very variable size of networks.

### Tacit Agreement ( $\mathcal{T}_A$ )

A tacit agreement is an arrangement where the parties have a common goal and yet perform independent actions (Figure 2). In other words, in a  $\mathcal{T}_A$ , although the parties do not have a commitment to joint activity, they do have an implicit agreement on the achievement of a punctual goal.

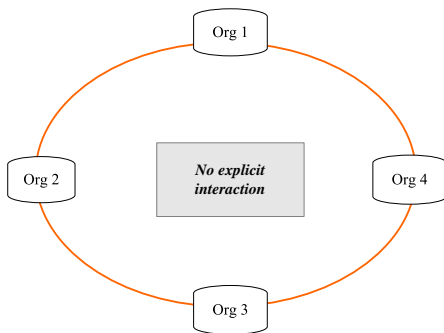


Figure 2: Tacit Agreement

Nations, organizations, agencies or private corporations may cooperate in a rather informal manner. They may undertake various independent actions to favor certain shared goals with little or no actual coordination. We may consider the following examples to illustrate the concept:

1. Private corporations may wish to develop a new and emerging market for an innovative product. They may collaborate minimally to define technical standards for the product and will then compete among themselves to secure a share of the developing market. Each makes available a supply of the product and advertises and promotes its own wares, and these independent and competing actions contribute to the common goal of creating a new market.
2. In a parliamentary system, there may be a number of parties in the legislature. Parties in opposition may have very different political and social policy positions and yet share the goal of defeating the party in power. They may have no formal cooperation or coordination, but their cumulative

actions and votes may be sufficient to defeat the governing party.

3. In the politico-military domain, nations may find themselves in the position of undertaking independent and uncoordinated military actions that contribute to a common goal although there is no formal understanding or coordination. This was the case at one point during the Second World War when Great Britain and the Soviet Union, who initially had no alliance or treaty between themselves, were both at war with the then fascist nations.

Joint purpose can be related to different dimensions. In the case of a  $\mathcal{T}_A$ , as Allwood et al. put it (Allwood, Traum, and Jokinen 2000), one can say that there is mutual awareness of shared purpose, yet the different parties have not entered into an explicit agreement concerning working toward the purpose. In this context, joint reward, if any, would be the product of cumulative behaviours of independent actors and not the product of cooperative interaction in pursuit of common goals. In fact, at different stages, the parties may employ unilateral (only  $x$  is coordinating her own activity with  $y$ 's activity), bilateral (both are), or mutual coordination (both are aware of their coordination intentions and try to arrive at some agreement) (Castelfranchi 1998). Mutual coordination would necessarily require some collaborative coordination.

This configuration involves few parties that interact directly. All parties are self-interested and completely independent and there is no control on the MOS. Membership conditions do not apply, and the whole arrangement is short-lived.

### Coalition ( $\mathcal{C}_L$ )

A coalition is a temporary alliance or partnering of individuals, groups, organizations, or nations in order to achieve an explicit goal. Forming coalitions with other groups of similar values, interests, and goals allows members to combine their resources and become more powerful than when they each acted alone (Col 1998). In addition to increasing access to resources, a coalition results in an enhanced profile, presence, and 'leverage' (Neufeld 2003). Participating in a coalition provides an organization with increased capacity and impact, but also with more contacts and relationships, more exposure, more legitimacy, and more support from the outside. But sometimes, coalition building is only a matter of convenience, legitimating actions that cannot be taken unilaterally. Moreover, a coalition can adopt different goals as actions are taken and results are obtained.

Examples of coalitions may be drawn from different social contexts:

1. In a parliamentary system, smaller political parties may form a formal coalition, dividing power among themselves, in order to form a majority in the legislature. None of these parties, however, abandons the objective of eventually being the sole governing party through the electoral process.
2. In floods, forest fires and storms, various public safety and service organizations may be called upon to collaborate in ways that are foreign to their usual practices. Not

only police and fire-fighting forces may be involved, but also military and para-military forces, public utility companies and private construction firms can be called upon to quickly agree to find ways to work together.

3. A military coalition is an ad hoc arrangement between two or more nations for common action. These partnerships can occur in both regional and worldwide patterns as nations seek opportunities to promote their mutual national interests or seek mutual security against real or perceived threats. Military coalitions have been frequent throughout history, with the most recent examples being the two wars in Iraq.

A coalition is a dynamic structure that can gain or lose members, and thus vary in size. Yet, the principal actors of a coalition are few and in some cases, the unity of the coalition is based on a mutual perception of membership rather than on a formal structure (Stevenson, Pearce, and Porter 1985). The coalition members cooperate in joint action, using the full spectrum of cooperative processes, each in their own self-interest. They have a shared goal or goals, but they retain whatever independence of action that they have in other areas. Within the coalition, the members will retain, to a great degree, their own culture, doctrines and ways of work, making the coalition a heterogeneous entity.

As shown in Figure 3, coalitions are the most complex form of multi-organizational configuration, given that participating teams, yet under full control of their reporting organizations, are required to be inter-operable and achieve unity of effort as a single organization.

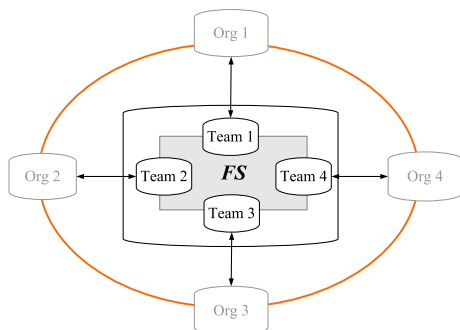


Figure 3: Coalition

One of the important challenges of coalitions is their sovereignty issues. Coalition operations may be driven by common agreement among the participating partners or through a mandate provided by some external organization. Either way, the full-control feature remains an important factor because the interests and the influence of reporting organizations often compete with the efficiency of the coalition. Contrary to what is generally perceived, capabilities are not the only factor in assigning missions to participating teams. Equitable treatment and exposure of all members must be ensured. All members must have fair representation on planning and decision-making processes and all must perceive missions as appropriate, achievable, and equitable in terms of burden and risk sharing (ABC 2001).

In military operations, any decision concerning the actions of a coalition requires the consultation of its participant members, and the leader has to accomplish the mission through coordination, communication, and consensus or leadership rather than by traditional command concepts (ABC 2001). Several command and control configurations are possible. One is that the nation providing the largest amount of forces for the operation is assigned the lead role, other nations providing appropriate liaison personnel. An alternative to the lead nation concept is the parallel command structure, under which no single coalition commander is named. The coalition leadership must develop a means for coordination among the participants to attain unity of effort. Finally, in a combined structure, two or more nations serve as controlling elements for a mix of international forces, such as the Gulf War coalition (ABC 2001). Ill-defined command structure in coalitions can negatively affect timeliness of decision making and decrease overall efficiency.

The unequal contribution of the participants can also bring about some issues. While some members will be frustrated with the shortcoming of others, others may become irritated by the increasing influence of more powerful parties. The commitment of participants contributing to a coalition may be very different. One participant may see the joint activity as critical to its well being, while another will be represented only symbolically. Also members may change their position and leave the coalition at any time, which can create stability problems. The whole coalition dissolves when its purpose no longer exists or when the coalition ceases to suit its designed purpose (Horling and Lesser 2005).

**Consortium ( $C_R$ )** A consortium is an entity created by several organizations, usually for the purpose of increased access to resources (Neufeld 2003). Consortia are the business counterpart of coalitions, with which they share many features.

Private corporations may form consortia to undertake commercial projects that are beyond the capacity of any single member of the grouping. This is often the case for large construction projects such as hydro-electric generation systems. The firms collaborate closely in the joint project, which defines the scope of their shared goal, but remain in competition in other fields. The heterogeneous character of consortia is less problematic than in coalitions because of the business-oriented nature of the partnership. For the same reason, the membership is more stable and the size is relatively constant. A consortium has an engagement with regard to a third party, who employs the consortium team on the basis of certain capacities or competence that must be preserved until the end of the project. Furthermore, contrary to coalitions, the teams are only partially controlled by their reporting organizations.

**Coordinating Unit ( $C_U$ )**

A coordinating unit is an arrangement where several organizations agree to have some of their activities coordinated by a separate but shared unit, in order to achieve a common mid-term goal (Figure 4).

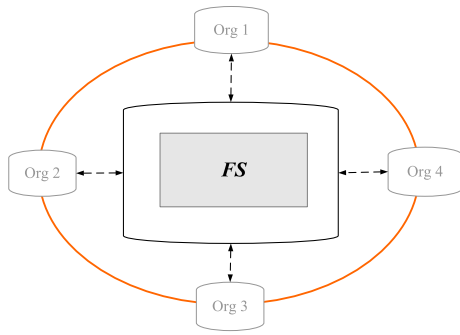


Figure 4: Coordinating Unit

For example, several countries have created ‘units’ or ‘centres’ to coordinate efforts related to Essential National Health Research (Neufeld 2003). Other examples are:

1. In military operations, coordination centers are a means of enhancing stability and interaction and improving control within a coalition, especially when operating under a parallel command structure (*i.e.*, no single participant has the lead). The coordination center can be used for Command and Control, as well as the control of a variety of functional areas (ABC 2001).
2. In business, firms will typically form a separate entity, a *joint venture*, that is partially owned by each of the original firms in some agreed proportion. Governance will be carried out through the establishment of a board of governors and through the assignment of key administrators. Capital will be found and profits divided according to detailed documents agreed to by the participants. Each participant will likely contribute with some significant, and perhaps unique, expertise such as technology, manufacturing or marketing ability. One example of such an alliance is NUMMI a joint venture of Toyota and General Motors. A second example is that of Ericsson and Sony who collaborate in the production of mobile phone handsets.

Aimed at creating synergy around a specific joint activity or product, a coordinating unit or a joint venture functions as a single organization with its own resources. However the resources and the activities are managed at a higher level. The MOS is equally and partially controlled by the participating organizations. As a separate organization, the coordinating unit has its own governance system and enables the full spectrum of cooperative processes. Members are few and membership is closed and irreversible.

### Alliance ( $\mathcal{A}_L$ )

An alliance is an arrangement where organizations with similar goals intentionally synchronize their activities, and sometimes actually share resources (Neufeld 2003) (Figure 5). This is a formal arrangement among as many partners as possible, designed to address a long-term situation.

Based on direct interaction, the degree of integration in alliances reflects the will of the member organizations. The

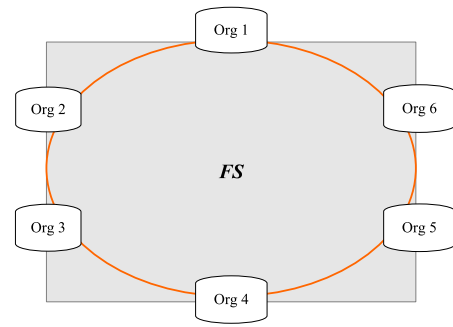


Figure 5: Alliance

MOS as a whole is only partially controlled by each of the participants, who by engaging in the alliance accept some delegation of their freedom of action to the alliance. Membership in this MOS is open and reversible, although strict conditions must be met.

A military alliance is a formal agreement between countries related to wartime planning, commitments, and contingencies. Military alliances often involve non-military agreements, in addition to their primary purpose. The best known military alliance of our time is the North Atlantic Treaty Organization (NATO), which has existed since 1941 and has been undergoing major transformations since the collapse of the Soviet Union. Other military alliances include the Warsaw Pact of the Soviet period and the Axis agreements of the Second World War.

The long-term nature of military alliances requires profound political agreements concerning goals and principles and expressing a common view of the future state of world society. One needs only to reread the basic documents that created NATO - the Atlantic Charter of 1941 and the North Atlantic Treaty of 1949 - to see how far-reaching these agreements may be. It is the common vision that allows the subsequent accommodations in culture, doctrine and ways of work, making an alliance an efficient and effective organization. Of course, alliances may change as the world changes and it is always possible that the close collaboration of one era may not continue into the next.

### Union ( $\mathcal{U}_N$ )

A union is the ultimate agreement of collaboration where two or more entities unite. A union is a closed, irreversible and permanent fusion of organizations (Figure 6). This involves the melding of cultures, objectives, doctrines and ways of work in a permanent manner and the establishment of a single means of governance.

Unions can be formed in different domains:

1. In the business world, mergers and acquisitions are the means of uniting separate firms. Mergers involve the willing union of firms on a more or less equal basis, while, in acquisitions, one firm purchases another in an agreed (friendly takeover) or contested (hostile) situation. A recent example of a merger is the union of the Molson and Coors breweries, while the union of Daimler-Benz and the Chrysler Corporation was essentially a friendly takeover.



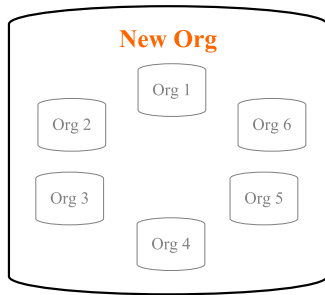


Figure 6: Union

2. In the political world, there are few recent examples of outright and complete political union, although the countries of the European Union have taken major steps to create a common political space.
3. A military union must necessarily be preceded by a political union. The formation of the Eurocorps in 1992 was the concrete implementation of a political will that was developed between France and Germany. Since that time, the Eurocorps has followed the evolution of the European Union and now comprises military contributions from Belgium, France, Germany, Luxembourg and Spain. Its headquarters are located in Strasbourg, France. It is not yet clear as to whether the Eurocorps will remain a military alliance or whether it will evolve into a military union.

While engaging in a coalition or an alliance might distract the members from their initial organizational goals, with a union, entire organizations become absorbed by the new common goal, and completely lose their autonomy. A union creates one single organization in which control structure and cooperative processes are no longer an issue.

### Discussion

Table 1 synthesizes the features of different types of MOS, allowing comparison.

When it comes to inter-organizational cooperation, two critical factors are the global performance of the MOS and the autonomy of participating organizations. If we situate the MOS identified here on a spectrum ranging from a network to a union, as in Table 1, we could say that the  $\mathcal{A}_L/\mathcal{U}_N$  end provides greater performance obtained from cooperation, at the expense of loss of autonomy of the member organizations, while the  $\mathcal{N}_W/\mathcal{T}_A$  end preserves autonomy, but offers limited performance, given the reduced scope of the cooperative activities. Somewhere in the middle, coalitions, consortia and coordinating units, allow for more efficiency by enabling partnerships that are not as constraining as alliances and unions, and at the same time, are structured enough to attain certain objectives. This is a space where a small number of partners decide to achieve a short-term operational goal, and create a new entity dedicated to their common activity.

Paradoxically, short-term goals ( $\mathcal{C}_L$ ,  $\mathcal{C}_R$ ) or goals which concern a particular domain of activity ( $\mathcal{C}_U$ ) imply the cre-

ation of a shared separate entity. This is because short-term goals are associated to partnerships with a focus on outcome (e.g., designing new products, launching new concepts, etc.). In this context, the creation of a new entity which would be entirely dedicated to this new activity is not only worthwhile, but necessary for harnessing the collaboration efforts. MOS that rely on direct interaction are either lasting partnerships, which pursue long-term strategic goals, or emergent ones with very weak mutual commitment.

The relationship between the number of the participants and the intensity of cooperation is an interesting one. The MOS at the two ends of the spectrum can have many members. At one end, partners have loose collective activities that require no commitment, and at the other, strategic cooperations, seek force in the numbers. The MOS in the middle have a restricted number of participants. As a matter of fact, tight collaborations established in the pursuit of specific results (e.g.,  $\mathcal{C}_L$ ,  $\mathcal{C}_R$ ,  $\mathcal{C}_U$ ) put a limit on the number of participants and the lifespan of the partnership. Collaborations - result-oriented cooperations - take place between a small number of individuals/organizations who bring distinctive if not unique value to the creative process, and are over when the results are reached (Denise 1999).

The intensity of the cooperation at a given time and the level of commitment of the participants do not have a direct relationship. Commitment is directly reflected in the spectrum of MOS, increasing from networks to unions.

As to control, the most effective structures seem to be those where reporting organizations exert partial control by means of an administration board ( $\mathcal{C}_U$ ,  $\mathcal{A}_L$ ). Finally, although we defined control in MOS in terms of the partial/full dichotomy, there is also the issue of the power relationships between the partner organizations. More powerful parties can have more decision making authority and thus more global control over the mission of the newly created MOS.

### Conclusion

The study of teams, organizations and MOS shows that cooperation does not exist outside an organizational context. Individuals will not cooperate if they do not have performance goals, and expect cooperation to allow them achieve those goals. Informal networks linked by information sharing or vague coordination disperse and dissolve at some point. Cooperation must be supported by an organizational framework that sets goals at different operational levels and measures the performances relatively to those goals. Organizations and MOS provide a 'structural objective basis' (Castelfranchi 1998) for cooperation.

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	PP	CCS C-Structure	C-Processes	DM Size	Type	
$\mathcal{N}_W$	Mutual benefit (No term)	Direct interaction	No control	IS	Very variable (++)	Open & reversible
$\mathcal{T}_A$	Punctual goal	Direct interaction	No control	None/CA	Variable (+)	NA
$\mathcal{C}_L$	Short-term operational goal	Shared entity (heterogeneous)	Full control	FS	Variable (+)	Open & reversible
$\mathcal{C}_R$	Short-term operational goal	Shared entity (heterogeneous)	Partial control	FS	Relatively constant (+)	Open (conditional) & reversible
$\mathcal{C}_U$	Mid-term domain-specific goal	Shared entity (homogeneous)	Partial control	FS	Constant (+)	Closed & irreversible
$\mathcal{A}_L$	Long-term strategic goals	Direct interaction	Partial control (administration board)	FS	Relatively constant (++)	Open (conditional) & reversible
$\mathcal{U}_N$	Permanent merger	Fusion	NA (centralized)	FS	Constant (++)	Closed & irreversible

Table 1: MOS and features (PP: purpose of partnership, CCS: control & cooperation structure, DM: dynamics of membership), (+)/(++): small/large number of participants

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