Chapter 15
Information Technologies (ICT), Network Organizations, and Information Systems for Business Cooperation:
A Focus on Organization and Strategic Knowledge Management

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ABSTRACT

Information Technologies (ICT) have developed systems and network organizations that foster the creation of resources for company management. The establishment of strategic alliances and business cooperation systems has been encouraged by ICT and information systems management. This focus on organization and strategic knowledge management shows the capabilities they provide in managing organizations' intangible assets, information and knowledge, since they are a competitive advantage. Network organizations, intercompany systems, cooperation, and alliances with the support of ICT are the paths to enterprises growth and development.

INTRODUCTION: THE DEVELOPMENT OF ICT AND NETWORK ORGANIZATIONS

The globalization of the economy, the knowledge society and the development of telecommunications are turning the world into a single space and an instant virtual reality. Starting from the "system theory" we can approach the world of Information Technologies (hereafter ICT) and regard it as a vast network of interconnected systems with subsystems and in turn with the components of each one of them which influence each other.

In the words of Bueno (2000), "it has been evident over the last century that without the contributions of Einstein and scientific development that they have caused we would not be talking about the Information Society today." As a consequence of it, over the past three decades we have seen a great scientific and from the academic community interest with the publication of studies, which predicted an increase and improvement of the results in those companies which invested in Information Technologies (ICT), associating recently the investment in ICT with positive effects in organizations, apart from the alignment between business strategy and Information Systems for Management. It is also remarkable other works on the zero, even negative productivity growth in ICT intensive firms (Brynjolfsson and Hitt, 2000).

The time variable forces to raise the two following premises in the universe of permanent and instant connections linking ICT: (1) changes occur in an accelerated manner. Organizations able to evolve and adapt to the market, are the ones most prone to accept changes. (2) The response must be immediate. The organization achieving success will be the best prepared to deal with the element of surprise (Cegarra et al., 2007).

According to Rincón (2003), organizations from this perspective relate to each other, creating and extending links between them, even blurring their boundaries in moments of collaboration, existing the possibility of situations of conflict, competition, or monopoly. In this context the "network" is born as a modern organizational form, born to respond to a new management style and a new way of organizing relations between companies. This indeterminacy shows above all a break with the classical theories about the firm and organization (Mendoza and Planellas, 1995).

Organizations are dynamic entities that welcome new individuals within it, see how others leave, establish evolutionary relationships with their environment and change their orientation more or less voluntarily. As we have seen, the function of organization is to establish an intentional structure of roles for members of an organization in order to ensure identification of all tasks necessary to achieve the objectives (Ribeiro, 1992). That is to say, organizing basically means dividing and allocating work among members of the organization. In addition, so that this division will achieve the objectives it is necessary to establish coordination mechanisms.

From the moment the company is considered as conscious organization of individuals willing to comply with their aspirations, is explicitly recognized the conflict of objectives and the differences in knowledge among the participating members. Both elements are key dimensions on which design economic theories and inner workings of organizations revolve (Salas, 1987) and, from this perspective, the important thing is to select those alternatives that solve the constraints due to the situation of partial and asymmetrical knowledge of members, as well as the different interests expressed among them (Saiz and Manzaneda, 1998).

From a strategic point of view the objectives of the company are focused primarily on finding a competitive advantage through cost rationalization, progress against the competition in terms of market needs, quality, design, etc.., and to provide services and products to the market in a fast and competitive way (White et al, 1995).

To achieve these objectives the company has to take two types of strategy: internal and exter-

nal. In this line, the strategic direction, through external analysis (opportunities and threats) and internal analysis (strengths and weaknesses), plans the action to achieve a competitive advantage and control the system, in order to redesign and restructure the solutions to achieve the objectives.

The organizational structure has been considered in literature as an important mechanism to make the strategy operative (Vickery et al., 1999), constituting an intangible resource of the organization, source of competitive advantages.

Network organization and ICT as a tool that links it, has the vocation to meet the requirements arising from new forms of enterprise development, basing his power on the ability to match a wide range of modern management instruments, although it is in the way of exercising corporate leadership, where the key to his success really is (Briones, 2007, p.252, Briones and Cegarra, 2007).

The Nets question hierarchy Networks as a privileged mode of regulation of the unexpected, the specialization of tasks as the basis for the division of responsibilities and the concept of centralization-decentralization of information as the basis for organizational design (Ballé, 1998). The paradigm that inspires them is based on the primacy of the interfaces between components (in relation to the components themselves), the flexibility of the roles entrusted to individuals with multimembership and the priority given to organizational dynamics in the structural form. The design of the organization strives to define the basis of a combination including the ICT from the strategic point of view, to ensure rapid adaptation of the modes of action (Mendoza and Planellas, 1995).

In this context Suarez (1996) studied the types of network structures, and he states that it is likely that cooperation is planned or organized by the company (or companies) main network, that is why the interests of smaller players may end up subordinated to the companies responsible for the most important roles of coordination. In many cases, outsourcing cooperative has helped small businesses remain so, by allowing specialized operations remain independent and external to these companies.

A network organization is a constellation of organizational units or individuals generally connected with minimum formality and little standardization, including maintaining a substantially horizontal or lateral relationship and little hierarchical and grouped together to achieve a common purpose. Molina (1999) defined the network as "two or more organizations involved in long-term relationships." Jarillo (1988) understands the strategic network as an organizational form that can be used by businesses to position themselves on a higher competitive level. Fernandez et al. (2004) relates it to a virtual organization or "network of legally independent organizations which, on the basis of cooperation and supported in the use of ICT, try to achieve a goal." To that end, the virtual organization is a network of organizations based on cooperation (Cegarra et al. 2007).

The defining characteristics of the network organization:

1. *Organizations are highly decentralized, with many organizational nuclei, usually scattered, and multiple centers of decision.* This type of organization has the coexistence of different power centers which, though coordinated, display a great capacity for independent operational decision, to the point that each one has its own distinct interests and sometimes in competition with the common purpose.
2. *Operating procedures are not always written or standardized,* circumstances which give to centers the decision a greater flexibility to fit be`tween them and the external environment in which they operate.
3. *The mutual understanding between its components is limited*, usually due primarily to autonomy in their development and management that does not require for its operation chains, specific knowledge of how to proceed

in each of them, or by physical separation of the cores that they form.

4. *What unites them is a common interest or mutual benefits they achieve*. They adapt through well-defined processes, almost contractual and necessarily written, which is a survey of the performance objectives to be given between them, the accuracy at the time of delivery or performance, their quality, etc. With repetition and experience a degree of commitment and precision is acquired, and that constitutes the organizational culture of a community of interest.
5. In these organizations, within its structure, there is a central core that has the basic competencies, in many cases not very well known and with a little hierarchy, which exerts its influence on the rest of the organization, ensuring the objectives of common interest which are the basis of their joint action. You can also exercise their influence due to the fact that it has a more complete and centralized information than other nuclei.

Though there is a core, it may not have a physical center and it consists of diffuse committees, so that the apparent disappearance of the physical or formal center doesn't imply the death of the organization but sometimes it can be replaced.

ICT FOR NETWORK MANAGEMENT COMPANIES

The relationship between ICT and business competitive advantage remains a subject of intense discussion about issues such as: 1) the organization as the unit of analysis, 2) the role it can play in

Table 1. Square evolution of information systems and technologies

PERIOD	CONCEPTIÓN OF THE INFORMATION	SYSTEM OF INFORMATION	PURPOSE OF THE SYSTEM OF INFORMATION
1950 UNTIL 1960	Bureaucratic requirement Necessary and perverse. Focus of data.	• Technological developments based on the microprocessor. • Electronic machines of accounting (MEC). • Systems for the process of transactions (SPT).	• Elaboration, transmission, manipulation and presentation of data. Treatment of routine transactions. • Speed in the accounting and in the prosecution of the documents. Maintenance of the databases.
1960 UNTIL 1970	Support to general purposes. To direct, to regulate and to control.	• I.S. for the administration (AIS). • System of Managerial Information. • Organizational system. New tendencies of the organization.	• Speed to the requirements of information. • To obtain, to try and to transmit information. • Informatization process. • Establishment of internal, external nets, professionals, cultural, educational and of identity. • Elaboration of reports starting from databases. • To support to the address in their functions.
1970 UNTIL 1980	Administrative control of the user's necessities.	• "Systems of support of decisions (SSD). • System of help to taking of decisions. • Systems of managerial support.	• To improve and to adapt in a specific way the taking of decisions. • Support to the taking of decisions by means of the use of analytic models and the access to databases.
1980 UNTIL 2000	Strategic resource. Advantage competive.	• Strategic systems. • Executive systems of Information (SIE). • Systems of Automation of Offices (SAO, you HEAR).	• Specific interactive systems for the necessities of information of the high address. • To promote the survival and prosperity of the organization, like an expert's support. • To facilitate the communication among the members of the organization, and between the organization and their environment.

Source: Own elaboration

relation to otherinternal or sector-based variables, and/or 3) using business outcome measures based on secondary sources, profitability, productivity, etc. - (Bruque, 2001, Bayonne and Garcia, 2002).

More recently, studies show feasibility and potential spread about the role of ICT in the organization of work as Resource Planning Systems Enterprise (ERP) (Ramirez and Garcia, 2005), telecommuting and flexible in the post (Perez et al., 2005; Urgal, 2005), internet and electronic commerce and inter-organizational collaborative technologies and systems (Briones, 2007, 2009).

Toe Spanish government, through its INFO XXI initiative, aims to develop the "Society of Information and Knowledge" promoting the use ofICT (Briones, 2007, p.168). That way we could think of the widespread implementation ofICT in business, and the positive results they provide, as recently reviewed literature tells about it (Urgal, 2005, Iglesias et al., 2005; Najera 2005, Meroño and Soto, 2006).

Picking a definition ofPorter (1980), "a strategic group is a set offirms in an industry following a similar strategy over anumber ofkey dimensions." Besides, it could be characterized by the level of implementation of the ICT, and their influence in the companies of the group. In this line, Zuñiga and Rodríguez (2003) find that industries formed by different groups ofcompanies, organizations in each group, with very similar strategic behavior patterns, but perhaps quite different with respect to the entities that are not used in the same way the ICT.

The technological revolution leads to "the implementation of ICT strategic management business" (Porter and Millar, 1985), and/or in the "Information Systems and Technology (IS/IT)" for direction, so that both are currently integrated in the strategy of the company. Since the beginning of the computer age there have been jobs that predicted a number of positive effects based on these systems. In the table below, we try to bring out the "Evolution of Information Systems and Technology **(IS/IT)** for Management (previous square)," from the literature reviewed, on the basis of the design, the types and purpose of the Information systems listed (Briones, 2007, p.168).

MANAGEMENT OF INFORMATION SYSTEMS (IS)

At the present time the growing complexity of the administration tasks, caused by a hostile environment that evolves very quickly, has increased the role and interest for the Information Systems (IS). The organizations are taking conscience that information is one of the indispensable strategic resources to be able to compete. For many of them, the correct management of their Information Systems (IS) also constitutes an indispensable requirement (Eagle et al., 2000).

The Information Systems (IS) are defined as "an organizational and management solution, based on information technology, to a challenge that arises from the environment" (Cegarra et al., 2007). To design and use Information Systems (IS) in an effective way, it is first necessary to understand the environment, structure, function and policies of the institutions and the role of management and the taking of decisions of it.

Then it is necessary to examine the capabilities and opportunities that the ICT provide to give solutions (Laudon and Laudon, 1996). It is also important to consider that the information has a cost and a utility, requiring an organization. Therefore the Information System (IS) should be designed so that the value of the information is balanced with the cost.

The field of the analysis and design of systems regarding the Information Systems **(IS)** has its foundations in the general theory of systems. An Information System **(IS)** can be defined technically as a group of interrelated components that allow to capture, to process, to store and to distribute

the information to support the decisions and the control in an institution. Toe general theory of systems emphasizes the importance ofexamining all the parts of the system, and it helps to establish a communication among the specialists in different fields (Good et al., 1979; Forest, 1984; García-Tenorio and Pérez, 1999).

This way, the Information System (IS) is the one in charge of giving to the operating systems and of decision of the organization (Teece, 2000) the information and the opportune knowledge to help them to exercise their respective functions (Gupta and Govindarajan, 2000), and it is divided in subsystems to the object of facilitating the administration of the different groups where the activity of the company can be structured constituting a harmonic and integrated total so that the different activities can be related (Venkatraman, 1994; Vázquez and Dieguez, 1999; Alavi and Leidner, 2001).

Toe Information Systems (IS) forthe Directorate or Managementfuformation Systems **(MIS)** are the group ofhuman means and materials in charge ofthe treatment ofthe managerial information, by means of the entrance of data, their process and storage and their later exit, benefit and, sometimes, their exploitation (Kampas, 2000). A MIS varies from a company to another. It differs for the necessity of information of the components, size and complexity ofthe organization, the vital areas of decision for the operation of the organization, the structure of this, as well as of the system of authority and of the technology used for processing data (Gil, 2001). Toe adoption of decisions is a process that emanates from the reception and selection of information and it leads to action.

The Information System (IS), apart from facilitating the work of business decision systems, facilitating coordination and control of the processes of decision, can help managers and staff to analyze the problems, visualize complex questions and create new products (Kalakota and Robinson, 2001).

The reach of a project on development of Information Systems (IS) can be different according to the company or areas where it is carried out, but fundamentally it should respond to the following objectives:

- Support the goals and strategies of the company. It should provide all the necessary information for business operation in a given moment, whether this information is related to the directly productive daily activity, like the planning of the long term company.
- Provide to all the levels of the company the necessary information to control its activities. Information should not only provide the execution of functions or tasks, but the control and verification that these they have been carried out as it was foreseen.
- Get to adapt to the evolution of the company. It should be a system able to evolve to the rhythm of the company, because companies are more and more dynamic, and their necessities of information change over time.
- Use information like a corporate resource that should be Planned, Negotiated and Controlled to be more effective to the whole organization. It is extremely useful in a company to consider information like any another resource. This allows to rationalize and to optirnize the use of information. Therefore it should be negotiated the same way as any another resource so that they have the best information and to the smallest cost.
- Define the evolution of the current Information System (IS) toward the necessary Information System (IS). In f ẘ cases an Information System is developed before a company begins its activity. There is almost always a reality in information when the reorganization or setting to the day is suggested.

THE ROLE OF ICT IN BUSINESS STRATEGIC MANAGEMENT

The Information and Communications Technologies (ICT) can generate, access, transfer, share, codify informationandknowledge (Terrett, 1998); to store both (Mazón and Pereira, 1999), and improve communication and collaboration (McCampbell et al., 1999; Pelechado and De Pablos, 2003; Meroño, 2005; Martínez and Pérez, 2005 a and b). Strategíc management has closely followed the role of ICT in the strategíc formulation and installation (Teece, 2000; Alavi and Leidner, 2001) and more specifically, in their impact on business performance and competitive advantage (Brynjolfsson and Hitt, 2000). These, therefore, have acquired a strategic value, providing a closer relationship with suppliers (Kalakota and Robinson, 2001) because they facilitate information oftheir products and their application in the production process. No doubt an organization takes advantage of the power of information and communication technologies (ICT) when used to better manage theirinformationresources (Vázquez andDiéguez, *1999).Information technologies lead toa relationship ofquality and continuous improvement with clients,* transforming the nature of the competition in three ways: (1) its advances transform the structure of sectors (Martínez and Pérez, 2005 a and b), empowering the inter-organizational relationships (Medina, 2004); (2) it is an important way to obtain competitive advantage (Pérez et al., 2005); and (3) it generates new business, and new companies.

Basically, what is requested to the ICT is what is requested to any technology: that productivity increases, since this increase is the last cause of what all society pursues, the improvement of welfare and living standards (Drucker, 1999). Companies create knowledge as a consequence oftherelationships that theirinternal agents (e.g., partners, management and workers) maintain with the externa! agents (e.g., public institutions) (Cegarra et al., 2007). To this respect, companies can use multiple tools to acquire, distribute and use the information coming from their mentioned relationships. However, among all, ICT are the most important, and these technologies of information can be of access, exchange, and of government (or e-government). In spite ofthe multiple forms ICT can take on the intemet, these technologies of e-government are perceived by the companies as three tools:

1. Website or internet presence;
2. Collaborative tools; and
3. Tools for e-commerce transactions.

Finally ICTprovide flexibility on the exchange of information between individuals and organizations (Pérez et al., 2005). Por example, telecommuting is a tool for changing the organization traditional pattem, where the worker participates directly. It is usual in very developed in ICT organizations, where there is a control from the company that uses it and great communication with the social agents involved.

COOPERATION AND INFORMATION

More and more often, companies use information systems (IS) to get strategic advantage specific to establish cooperation with other companies (Briones, 2009, p.168). Besides, both the formation of the agreement and its management require a common space where partners can share and exchange large amounts ofinformation andknowledge, tacit and explicit, belonging to the agreement. Such spaces allow a better understanding of their own cognitive base and facilitate mobility and transfer of information and knowledge they have, generating a group learning process that comes into a community of practice (Senge, 1990, Brown and Duguid, 1991; Lave and Wenger, 1991; Warren, 1996).

Toe stimulus for the transfer of information and communication between the cooperating par-

ties may be the target or targets, which drives the partners to enter into a cooperative relationship. If the purpose of cooperation is the realization of certain research and development activities related to improving the efficiency of production systems or manufacture of new products, the joint use of infrastructure and quality centers or industrial innovation, collaborations involve the transfer of technology, intelligence and knowledge (Kampas, 2000, Gupta and Govindarajan, 2000; Alavi and Leidner, 2001), thus becorning a very productive exchange of information and learning (Teece, 2000 ; Kalakota and Robinson, 2001).

From the above it follows that cooperation is a dynamic process that can get to enable two situations: (1) a weak partner at the beginning of the partnership to be strengthened at the end of it, because it has had greater absorption and assimilation, being able to capture many of the interesting skills and capabilities of the other members, or otherwise, and (2) that the weak member results even more disadvantaged, because the strongest captures those elements which supported his competitive advantage.

Therefore, partnerships are high risk relationships, because firstly any partner may behave opportunistically, it also faces environmental changes and changes from partners themselves who will take the decision making process of the organization (Lewis, 1990; Gulati et al, 2000; Martinez and Perez, 2002).

Therefore trust and commitment are very important, both in training and in the management of the agreements. Das and Teng (1998), consider that for the proper functioning of partnerships, partners will need to have confidence that the partner will cooperate to achieve the expected results. That is, the concept of "confidence in the cooperation," understood as the certainty perceived by a company on the good cooperation partner will show (Gulati et al., 2000).

Therefore the argument that set as keys to successful cooperation is the development of "confidence in the cooperation," and depends on the number of partners and the confidence generated, measures of conflict resolution in the alliance, and Information Systems (IS) designed as control mechanisms that can provide complementary elements that generate a higher level of comrnitment on the proposed targets (Stuart, 2000).

An Information System (IS) and control (CIS) is a process for data capture, agile handling, together with the establishment of models of decision making support, which enables clearly to establish the objectives and results obtained through the agreement and corrective decision making of observed deviations (Saez and Cabanelas, 1997, Andreu et al., 1997). This will reduce asymmetric information, when all the partners are involved and know the strategic decisions and actions to follow, which generates high levels of trust and commitment, acting itself as a control mechanism (Saxton, 1997).

On the other hand, considering that the actions and functions entrusted to the business units of a network of companies are different for each one of them, information required in each case must suit the precise needs of each division to be able to effectively help their managers in making decisions. It is necessary to take into account *the activities of each of the network units,* aknowledge of the relations between them, it is convenient to define the information that these units need from each other as part of their responsibilities, avoiding excesses and its lack, and seeking this information and knowledge, really necessary for the management and control of each network unit responsible (Briones, 2007).

INFORMATION AND KNOWLEDGE

"Knowledge Society" (Good, 1998) is characterized by the constant appearance of new knowledge, i.e. the continued development of intellectual faculties that produce a knowledge generating competitive advantage of the organization. Thus,

the key to the organization is to transform data into competitive advantage.

Data are a set of discrete, objective facts about an event, which by themselves are of little importance or object, as they contain no inherent meaning or include opinions and interpretations. However, data are important to the organization because they are the basic raw material for the creation of information.

This information, in contrast to data, is meaningless, as these data become information when the one who creates them gives them importance and purpose through contextualization, categorization, calculation, correction and condensation. Finally, the i n fsmation is transformedinto knowledge through comparison and data connections (Davenport, 1999). These knowledge-generating activities occur within and between human beings, so that is transmitted through structured media such as books, documents, and through personal contacts ranging from conversations to learning (Ordonez de Pablos, 2001; Benavides and Quintana, 2000 and 2003; Ubeda, 2004; Chiva and Camison, 2005).

Arrow (1974) summarizes the advantages of centralization of knowledge, under the following arguments business decision process:

1. As the activities of individuals interact with each other and often compete for limited resources, the joint decision will be over separate decisions;
2. The optimization of this joint decision depends on how knowledge is distributed among the members;
3. It is recognized that transmission of knowledge is expensive and, therefore, it is more efficient to centralize knowledge in a basic unit distribution to individuals; and
4. Similarly, it is considered less expensive that a unit makes a collective decision and communicates it, than conveying all the knowledge required by that decision.

In the so-called "knowledge society," nor capital, nor natural resources, nor labor are presented as key resources but that "knowledge" is the resource (Drucker, 1999) that: l) occurs in systems language, technology, and collaboration of activities, 2) it is located in time and space in specific and particular contexts, 3)it is built and developed constantly, and 4) it has a purpose and is goal-oriented (Chiva and Camison, 2003).

Today, and in a more important way <day by <day, it is thought that "knowledge is a source of business value generation," with ability to build and sustain competitive advantage. This knowledge is considered a preeminent resource and is located in the following sources (Del Val, 2003):

- Direct, through information between individuals and organizational groups, provided they are willing to share and swap. For broadcast and memory information technology and communications (ICT) are available as support tools.
- Indirect, given by cognitive developments, typical of systems or technologies generated by human intelligence. These are specified in databases, protocols, and other enterprise information systems.

Organizations need knowledge to handle business complexity and dynarnic environment, to provide products and services that add value and encourage innovation (Kopp and O'Donnell, 2005). Thus, knowledge is an intangible asset, very difficult to imitate, which makes it very valuable.

According to Nueno (1998), "the development of knowledge is a fundamental process for any organization (institution or company) that pursues innovation." For Drucker (1999), value of productivity and innovation is generated through the application of knowledge to work, thus introducing the perspective ofknowledge-based company (Good, 1999; Ordonez, 2001; Wrightetal., 2001; Claver et al. 2002; Norman, 2002).

This last variable explicitly refers to the importance of the accumulation of knowledge within the company. Therefore, innovation should be interpreted in the context of a process of obtaining specific capabilities and dístinctive competencíes (Good and Morcillo, 1993, Benavides and Quintana, 2000).

Another consideration lies in the effective management of knowledge pos ses sed by members of the organization and, in this sense; it highlights the combination and resulting interactions between different types of knowledge which contribute to the organization, rather than dividing themselves, to reach innovative organizational structural forros (Saiz and Manzaneda, 1998).

KNOWLEDGE AND INTELLECTUAL CAPITAL MANAGEMENT

The analytical perspective of the knowledge-based company, known as a school of knowledge management is an extension of the theory of the firm based on knowledge resources considered perhaps the most important resource that the organization can have.

The model associates human resources practices (selection, training, participation, rewards, etc .) to the generation of the central competencies of Prahalad and Hamel (1990), through its relationship with knowledge management, and it studies the effects that human capital has, leverage of this capital (tacit knowledge acquisition) and the interaction of human capital to the company about the end result of this (Wright et al., 2001; Chiva and Carnison, 2003).

Oltra (1999) stresses the need to professionalize the human capital of the company as one of the priority practices for generating skills, and this management requires knowledge of the person in all its dimensions: information (about the environment), training (development of intelligence and creativity), foresight (vision), systernic organization or structure (horizontal, dynamic and flexible), means (that allow contact business world) and interpersonal communication (dialogue, sincerity, authenticity, availability, listening, empathy, trust, participation, etc .).

Knowledge must be the product for organizations to compete, while allowing them to create new business opportunities, being an intangible as set very difficult to irnitate, becorning very valuable. This is what knowledge management calls "Intellectual Capital" (Edvinsson and Malone, 1999). First, it is necessary to analyze the differences between Knowledge Management and Intellectual Capital. Not to be confused with knowledge management of intellectual capital management (Lloria, 2005), although they are two interrelated concepts, and need to be faced together.

Knowledge management is defined as a set of processes that use knowledge to the identification and exploitation of intangible assets in the company. However, Intellectual Capital refers to renovate and maxirnize that knowledge that is useful for the company, and influences its benefit improving competitiveness (Lloria et al., 2005). Prahalad (1999) states that next millennium will witness a series of fundamental changes in the competitive environment. Theserequirements will lead to radical new managers. These changes are related to the business function leadership and management of a set of knowledge flows (externa! and internal, captured or created, explicit or tacit).

Bueno (1999) defines this function as the one that "plans, coordinates and controls the knowledge flows that occur in the organization in connection with their activities and their environment in order to create essential basic skills," defining it as "environment knowledge management and intellectual capital." In the current organizational management knowledge management is considered a fundamental key as it seeks to capitalize on the knowledge and experience possessed by individuals, to create new knowledge, and exploit those who own the organization. However, the truth is that it is difficult that companies are able to develop all the knowledge and technological

skills needed to feed all their innovation processes (Benavides and Quintana, 2000; Benavides and Quintana, 2003; Chiva and Camisón, 2003).

Therefore, "management of intangibles in the firm is a process to produce value and knowledge to the organization," for which they must establish mechanisms to transform individual knowledge into intellectual capital (Edvinsson and Malone, 1999). In this section, we show that the element that is promoting the i$_{m\,p}$ lementation of "technologies" in the company is the growing importance of intangible management in the organization, which treat intellectual capital as a representation of the assets that allow greater or lesser extent in the generation and maintenance of competitive advantage. Peña (2002), states that "in the future the only sustainable competitive advantage will be managing intangibles along with emotions, intuitions, habits and culture of change." In this sense, knowledge management means "managing the processes of creation, development, dissemination and exploitation of knowledge to gain competitive ability" (Teece, 1998; Miles et al., 1998).

In Figure 1, we propose a circular vision of the administration of intangible ones in the organization, as logistical function and development of the necessary technology for the attainment of their managerial purposes (Briones, 2007, p.159).

Nueno (1998) also incorporates in this administration the term "organizational learning" (organization that he/she learns) to characterize to the companies or institutions able to improve thanks to the learning and, therefore, to maintain orto increase their competitiveness (Chiva and Nightwear, 2003; Übeda, 2004; Pérez et to the., 2004; Argyres, 2004; Ordóñez and Parreño, 2005; García-Morales, 2005).

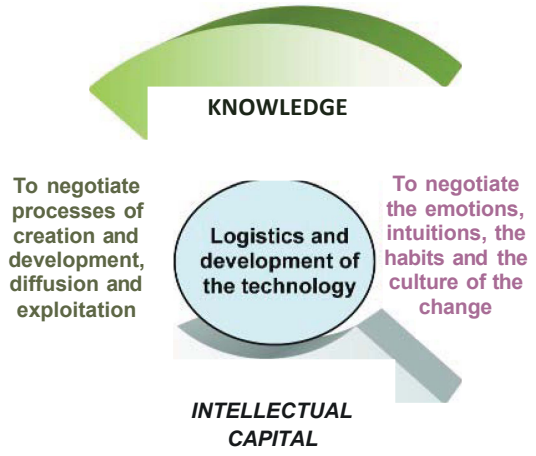
As a result of this learning, technology will affect the costs of organizing economic activity within the co$_{m\,p}$ any, and the expected benefits are: 1) obtaining faster and more frequent planning cycles, 2) the treatment and control of activities in critica! situations, and 3) the promotion of lateral relationships, improving direct contact and reducing the need for intermediation.

Today the management of intangibles in the organization is serving for the creation of new knowledge, which is the basis for achieving sustainable advantages. If cooperation has been developed with very different objectives related to cost reduction, obtaining efficient size, in the following section, we consider "knowledge as a source of competitive advantage" for business cooperation processes, and the role that plays for the company, the accumulation of new knowledge to acquire more information as a source of learning.

KNOWLEDGE IN COOPERATION

The vision given by the theory of resources and capabilities has been very i$_{m\,p}$ ortant in increasing cooperation agreements, which aim to externa! knowledge acquisition. Knowledge is considered the most important resource of the organization, and the ability of the company to create organizational knowledge is the power to create, maintain

Figure 1. Management of intangibles in the organization



Source: Own development

and enhance the competitive advantages of the organization (Briones, 2007, p.160).

From the organizational perspective it has also given meaning to the alliances from the theory of resource dependence, which suggests that the scarcity of resources forces organizations into cooperative activities with other companies (Fernandez, 1996). This approach of currents of thought of the general theory of management, which understand that cooperation, is an instrument of organizational learning (Benavides, 1995; Benavides and Quintana, 2000; Benavides, 2001; Benavides and Quintana, 2003), whichrepresents an ongoing process linked to the acquisition of knowledge and business performance improvement.

Cooperation is considered as an instrument of organizational learning (Menguzzato, 1995) in two ways: 1) an organization can establish sorne form of cooperation to learn specific knowledge and skills necessary for their activity and competitiveness, being the alliance the "vehicle" that allows the transfer of these skills from one organization to another (Kogut, 1988), and, 2) participation in the cooperation agreement enables the learning of the same process of cooperation (0oz, 1996), i.e., it facilitates learning the knowledge needed to design and manage their own cooperation.

On the other hand, the economy of transaction costs justifies the existence of cooperation to favor the transmission of "tacit knowledge" among companies. Indeed, it is difficult to formalize the transfer of tacitknowledge between organizations type and unviable through the market relationship. This is because the transfer requires a close relationship of the staff, so that viable alternatives are using the internal organization and/or hybrid forms from inter-organizational relationships. Thus, sorne forms ofbusiness cooperation, which introduce a close relationship between companies, may represent efficient ways to access such knowledge (García Canal, 1993, Medina, 2004).

In this sense, from both theoretical perspectives-organizational and transaction costs, the objective is the acquisition and internalization of knowledge, for its use not only in the framework of cooperation and for the duration of the agreement, but in every activity outside.

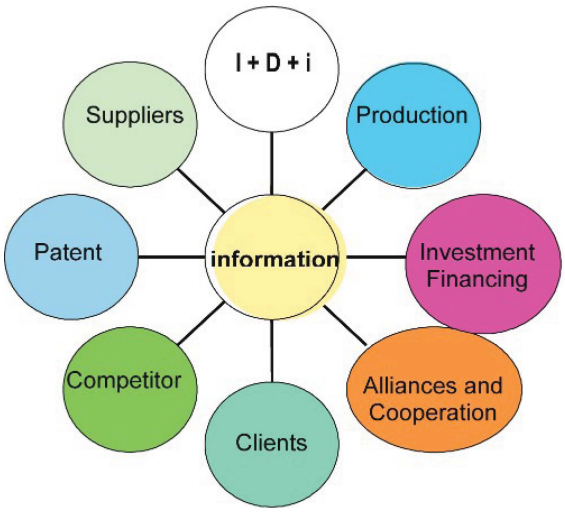
According to Nueno (1998), recounting the role of"social agents in the acquisition ofknowledge": 1) people incorporate a certain set of knowledge (tacit knowledge) through proper organization of work, you can exchange tacit knowledge and learning, at this stage called "socialization," 2) how difficult it is able to present the new knowledge gained in the process of socialization in a format that allows dissemination to third parties. As described in a support knowledge (explicit), and this phase called "outsourcing," 3) it also points out that if we are capable of outsource learning, then we can teach many achievements, but we can also combine them with other existent knowledge, to this new phase the flame "combination"; and finally, 4) he affirms that the group of combined knowledge is acquired by a person in the phase of "internalization," enriching this way its level of tacit knowledge. The repetition of the cycle and another time, people that integrate the work groups, changing takes to a process of continuous learning.

In Figure 2, we have tried to illustrate the paper of the intercompany cooperation as a process of accumulation ofknowledge, learning on the importance of"information as a source of organizational learning" that configures new innovation forms in the companies (Briones, 2007, 162).

COOPERATION AND INFORMATION TECHNOLOGIES (ICT)

lnformation Technologies (IT) in relation to cooperation can be appliedin two ways: (1) the purpose of cooperation, i.e. agreements between two or more companies to jointly develop a particular type of IT, and, (2) as a tool to help management cooperation, apart from its purpose.

Figure 2. The cooperation like process of accumulation of knowledge



Source: Adapted of Pavón and Hidalgo (1997)

The development of various Information Technologies (IT) as a goal of cooperation agreements is increasing mainly for two reasons, firstly companies encounter serious difficulties in developing the IT they need internally, and however, find critica! support at government level for the creation of joint projects with third companies. Secondly in the IT sector firms have increasingly less profusion life cycles in theirproducts, forcing them to perform considerable effort in time and cost to maintain its competitive position.

It's about experiencing and expand by improving theirtechnological capabilities, using dynamic capabilities and an entire cast of collaborators, in order to bring innovation tasks that would hardly be carried out by the company individually (Mendez and Torres, 2000). Bayonne and Garcia (2002) show that the development of IT influences cooperation in innovation by facilitating knowledge transfer, saving time and costs, and encouraging internal development of knowledge in the company.

The second approach considers IT as facilitating tools for managing business cooperation projects, both to achieve the objectives of cooperation, to effectively carry out its management. There are many different combinations ofIT with partners that have a cooperation agreement, like any business, but most of them lead to generic inter-organizational systems (Gil, 2001).

Inter-organizations Systems (IOS) are Information Systems (IS) automated shared by two or more companies, where the introduction, treatment and access to data is shared to a greater or lesser extent by the participating companies (Mendez and Torres, 2000). The benefits of information technology are clear well-structured work environments (Fernandez et al., 2004, Najera, 2005). However, benefits of collaborative technologies are not easily determinable as classical technologies (Meroño, 2005), existing, for example, difficulty in integrating e-government technologies in business processes (Cegarra et al., 2007).

Meroño (2005) called lT inrelation to cooperation as "e-business" collaborative purposes tools (ECT), and proposes a framework of collaborative technologies own business: 1) innovative managers, and likely attitude to business cooperation 2) complex organizations with large size and dimension, and 3) where there is an intense caring about knowledge and technological development. Furthermore, Meroño (2005) describes "e-business" collaborative purposes tools (ECT); groupware, computer-based communications, group support systems, and more recently knowledge management systems.

The main ICT affecting the formation and subsequent development of cooperation agreements are described in the following section.

ICT IN THE PROCESS OF COOPERATION AGREEMENT FORMATION

The first step before initiating contacts with potential partners, is knowing what the market situation and potential partners are. We use information providers (companies specialized in finding information), reports of industry associations and business information. ICT used are Internet and databases.

- The Internet has lots of knowledge, and enables searching and locating the necessary information to start the cooperation process (data on potential partners, product lines, production complexes, distribution channels, customer geographic distribution - information on the sector, other competitors, other cooperation agreements and their contents), using hyperlinks multimedia system, linking phrases highlighted in a text (hypertext) to any other computer (server) that contains more information about the pre-marked sentence (Carpintier, 1997). It encourages the exchange of information (Croasdell, 2001) and knowledge (Pérez, 1999; Guadamillas, 2001), and cheaper communication between potential subjects of cooperation (Claver and Gonzalez, 1999).
- The database is a repository of data, information and knowledge about the company inner experience. It enables maintenance of organizational memory (Ruggles, 1998; Croasdell, 2001) and statistical analysis of their content promotes a better understanding of business trajectory, the development of strategies and action plans, and the study and preliminary analysis of the proposals to other participants (Kalakota and Robinson, 2001).
- It also allows organizations to adapt quickly to changing opportunities (Prahalad and Hamel, 1990), as it helps to understand the context of activities and know how the organization has operated under similar or different circumstances in the past (Croasdell, 2001).

The second step, once selected prospective partners, is the negotiation process that requires extensive information analysis and the establishment of an increasingly fluid communication, favoring the conclusion of an agreement, and analysis of its future effects. Among the most useful tools are databases, email, chat, groupware, simulators and SSD.

- **E-mail:** Facilitates information exchange and allows you to send documents, programs and text, between individuals or other groups through computer messages, thus the exchange of documentation and knowledge among the members of the negotiating table, which improves the level of involvement of members, its effectiveness, the negotiating process itself and, ultimately, the performance of the agreement.
- **Chat:** Is "technology that allows real-time dialogue, where many people have access to a virtual "room" where they exchange information using the keyboard, or even the voice and image" (Grandío et al., 1998). It promotes discussion between groups, regardless of their geographic location or affinity (Grandío et al., 1998), it reduces the cost of the process to avoid unnecessary travel; it facilitates periodic meetings and generates a higher breaking barriers and defensive routines as the individual is not there physically (Argyris, 1991) and has the ability to hide its identity.
- **Simulators:** Developed techniques to anticípate what will happen in the future, starting from an initial situation and real, analyzing the influence that all actions and decisions proposed in the agreement have

on business performance. This tool is essential to analyze the viability of the agreement under negotiation, analyze the implications for each of the parties, improve decision-making, and reduce the risk they pose and supporting its participants.

- **Decision Support System (DSS):** Which facilitates decision-making in group, ascooperation agreements require.

Toe third step is the signing of the cooperation agreement with the partner or partners considered adequate to achieve the objectives. In this phase, more ICT are used for the exchange of documents and preparation of the agreement for signature by the experts, such as lawyers and consultants, who basically used email and chat because of their nature and advantages already mentioned, and extensive to this stage.

ICT IN THE PROCESS OF COOPERATIVE AGREEMENTS MANAGEMENT

Once passed the initial steps to be followed in the formation of cooperation agreements we have seen in the previous section, it is necessary to plan the implementation of the cooperation process. At this point it is essential to inform and communicate to all members of the participating organizations (employees) and other groups directly affected and likely to know of its existence and content signature of the cooperation agreement. For this you can use e-mail and intranet.

Toe corporate intranet fosters interna! communication, so it is the appropriate means to publicize the cooperation agreement set, its contents and future occurrences in strategy and organizational structure. Moreover, this tool supports access and sharing of knowledge (Cohen, 1998, Ruggles, 1998, Gottschalk, 2000), its creation and storage, and facilitates some members of the organization demand transmission information and possible location. It is a tool for communication and interna! marketing strategy, corporate culture and business messages addressed to employees, because they have access to it a large number of geographically dispersed, and in a very short time span. However, it has great use because of the lack of information about its utility, reduction of interpersonal communication and greater reliance on technology.

Subsequently, you must create an action plan to successfully develop the necessary change for the effective implementation of the agreement. This requires the use of ICT such as the intranet, knowledge network and groupware.

- A *knowledge network* can be a group of people who cooperate and exchange information (Dinglreiter, 1998), and for that purpose they require the availability of a technical infrastructure. This tool has the capacity to generate access, transfer, and share and codify information and knowledge, using a common language, and it is a dramatic reduction in communication cost, because it has previously used as support networks (Gottschalk, 2000). Its use by those involved in the implementation of the agreement justifies its consideration as a facilitating tool. It is also very useful in other stages of this process.
- The *groupware* is any computer program or software that enables teamwork. Its purpose is to facilitate collaboration of individuals on projects, such as cooperation, which are separated geographically (in each of the premises of the cooperating partners); it generales ideas and strengthens existing ones; it reduces decision times and improves collective productivity. Anonymity is also granted to participants, which encourages constructive criticism of the ideas of other employees withoutjudgment directly to the person who suggested (Fulmer, 1993). This allows a better development of the action plan set in each of the participants in the process.

The initial administration of the cooperation agreement affects all cooperating partners and their respective members, so it is essential to have tools to facilitate communication (email, chat and intranet), group work (knowledge networks, groupware and EDI) and simulation programs (simulators and SSD) exists to start properly managing the process of cooperation and survival over time.

The EDI (Electronic Data lnterchange) is an Information System (IS) automatically shared by two or more organizations (Cash and Konsynski, 1985), which allows the electronic transmission of information or documents such as invoices or purchase orders between different computer systems, based on a standard and structured format. The benefits received by the organization with the adoption of EDI are twofold: operational and strategic. Toe operational benefits are i$_{mp}$ rovements in the daily functioning of the organization, for example, reduced administrative errors or inventory cost. Strategic benefits relate to the development of corporate strategies by forrning extemal relationships with customers andco$_{mp}$ etitors, such as improving customer service or the information shared with the supply chain.

Finaly, at the stage of maintenance and stability ofthe agreement, ICTwhich can be used coincide with those used in the initial administration, but purpose is different, i.e., they help to strengthen the cooperation agreement.

AN INTER-COMPANY SYSTEM FOR THE NEW FOCUS ON THE ORGANIZATION. A PRACTICAL APPROACH FROM THE BUSINESS POINT OF VIEW

From a strategic point of view ICT could affect each of the competitive strategies of Porter (1980), either cost leadership, differentiation, or specialization in a niche market, as well as the efficiency of activities involved in the value chain. Toe value chain can show how it will add value to the process, showing where improvements can be made and competitive advantages through ICT (Briones, 2007, p.170).

The concept of"value production chain" popularized by Porter (1985) is useful to understand the role of the lnformation System (IS) in the company and serves to highlight the role that is represented by information technologies (IT). This concept divides the overall business activity in technological and econornically distinct activities (Good, 1996), which are called "value production activities." Toe value chain distinguishes between two types of basic activities throughout the company: the "line," which is those that are directly concerned with the processes of value creation, and "support," in which the above rely to coordinate, share information, etc. (Briones, 2009, p. 61-62).

Decomposing the company this way allows understanding the behavior of costs and the existing and potential sources of differentiation.

Therefore, the company will get a competitive advantage to the extent that you develop the activities of each link in the chain better than the competition, being then necessary to analyze the impact ofICT in the strategic management of the organization.

Therefore, for example, a system ofEnterprise Resource Planning (ERP) is an information technology (IT), available to support organizations achieve their objectives (Rarnirez and Garcia, 2005), and get effectiveness in service and in operations that can be positively affected by the use of this technique as a strategic tool (Reyes, 2002). Rarnirez and Garcia (2005) briefly define a system of *Enterprise Resource Planning* (ERP) as a large commercial software solution consisting of several modules integrated into a single system, business activities through automation of all information flows, incorporating best practices to facilitate rapid decision-making, reduction of costs, and greater managerial control, achieving efficient and effective use of corporate resources.

In the same way, we try to highlight the importance of these "Information Systems and Technologies (IS/IT)," as an element of interest for the new "Focus of the Organization" (Briones, 2010, p.40). On the other hand, the tactical systems (coming from the TIC) are generated in the managerial environment, and later they are developed with the approval of the strategic plan of the organizations thatimplant them (see Figure 3). A tactical system is developed by the computer sciences department together with the directors of operations, being applied mainly to interna! functions of the company. However, the strategic systems are guided to improve the relationship with the environment, the high management intervenes in its planning and design, and it is closely bound on the strategy of the company.

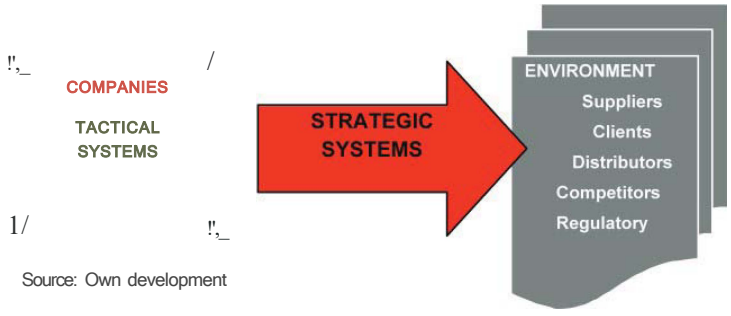
The Intercompany Systems Development (ISD) can be a powerful tool to change and to show a new balance in the relationships with the suppliers (Cash et to the., 1990; Premkumar et to the., 1994; Bergeron and Raimond, 1997). Interorganizations Systems Development (ISD) can be a powerful tool to change and show a new balance in the relationship with suppliers (Cash et al., 1990; Premkumar et al., 1994, Bergeron and Raymond, 1997; Carnison and Lapiedra, 1999).

Forexample,just-in-time delivery systems and electronic links between the two companies allow faster response, ongoing monitoring of the availability of certain goods in the warehouse of the supplier, and manufacturing programs scheduled commitments, systems EDI, SIE/EDI, etc. (Kuan and Chau, 2001; Martinez and Perez, 2005 b; Chenhall, 2005). The IS/IThave attributes that are complex (quality, process improvements, etc .) and that in the literature have been named as intangible or imponderables (Brynjolfsson and Hitt, 2000; Angeles et al. 2001). These IS/IT moderate the relationship between organizational structure, size, learning, culture and inter-organizational relationships with efficiency and innovation strategies, so that ICT and strategy must be attached, and if that union occurs the organization yields will increase.

CONCLUSION

In this chapter, with a focus on strategic organization and we want to show the relationship between the Information and Communication Technologies (ICT), and the advantage provided by its use. To do this, we have seen the evolution of information systems (IS/IT) for direction, and its periodical implementation in the company to support management and decision processes. Toe technological revolution brought about by "the implementation of ICT for strategic business management" and/or "Information Systems and Technologies (IS/IT)" for direction, so that both of them are now integrated in the company strategy, has led them to be considered a solution for administration that integrates the management of all organizations.

Figure 3. Intercompany Systems Development (ISD)



Source: Own development

In a different sense, when we try to explain the results, the company strategic management has been giving greater weight to factors related to the environment than to the interna! aspects. This is a planning-action system which starting from certain attitudes and strategic positions faces business complexity, ensuring the company's permanent adaptation to its environment and taking into account the contribution ofICTs in achieving results. New strategic approaches which are closer to the "adaptation, reorientation and cooperation of enterprises in the new competitive conditions" are introduced. And in this sense, network:ing organizations, business cooperation and partnerships are seen as procedures for growth and development of companies in general.

Sorne authors in literature try to explain the differences in competitiveness based on the unique sk:ills to gather, develop and use their resources and capabilities, being capable of generating efficiency, quality, innovation and customer satisfaction based on leadership in differentiation and cost strategies. Others stress the role of these dynarnic capabilities to configure their sk:ills and adapt to changing environments.

The new economic approaches try to respond to the raised allegations. The reasons forthe existence of companies with performance differences and the issues involved in their organization (coordination of activities or business decisions) cannot be justified only through the production process. In most occasions, the production activities are separable, so that they are not just technological issues which explain the existence of differences in efficiency.

The process of collecting information on the company is the key to knowledge management and although business cooperation is not a new phenomenon, this strategic tool takes on a new development because of the importance of intangible resources in the theory of the firm. When companies decide to form an alliance they are look:ing to increase their profitability and value creation, joining their resources and capabilities and supplementing them with knowledge from other firms. To this end, networked organizations use ICT to improve their interna! sk:ills and obtain profitability improvements.

This makes it encourage the study of information systems used in business cooperation processes and their applying in the field of strategic management of knowledge. From the various existing organizational models, the network organization has the vocation to answer to the requirements arising fromnew forms ofenterprise development, basing its power on the ability to match a variety of modern management tools, although the key to its success líes essentially on the way to exercise leadership.

We must bear in mind, given the current circumstances, that it is more and more difficult for organizations to operate in isolation, sometimes being necessary to practice a policy of alliances with all stakeholders in the market, even with the competition. Thus, the main reasons to create inter-organizational networks can be synthesized on reasons of value creation or cost savings, or it could be a combination of both of them. In short, we understand the networks as relationships between two or more organizations with long-term and strategic dimensions that constitute an organizational setting.

Among the benefits networks are: favoring inter-organizational learning, providing legitimacy and status, generating economic benefits in terms of transaction costs and economies of scale, i m p r٧ing the situation of dependence on externa! resources, etc. They also allow both flexibility and efficiency. The structure adopted by each network will depend on its circumstances and objectives, without forgetting that they are dynarnic entities, so that they can start with a structure and evolve differently.

For all the above, we consider that both the network organization as the inter-organizational network have demonstrated their usefulness, worth and importance for organizations in the current environment. Networks constitute long-

term cooperation agreements between different companies, but related, allowing them to gain and sustain a competitive advantage over fareign companies. On the other hand, infarmation and specifically ICT have become the main tool facilitating the process of cooperation and by extension inter-organizational networks. Organizations are realizing that infarmation is one of the strategic resources necessary to compete. Furthermore, it is increasingly frequent the use of Infarmation System (IS) to gain strategíc advantage when entering cooperation.

To desígn and use the Infarmation System (IS) effectively, it is necessary to understand the environment, structure, function and policies of the institutions and the role of management and its decision making. It is also necessary to examine the capabilities and opportunities provided by infarmation technologies to provide solutions. Not fargetting that the information has a cost and is useful in addition to requiring an organization. Therefare, there must be a balance between the value of infarmation and its cost.

ICT in relation to cooperation are given in two ways; as purpose of the agreement, i.e., to develop IT in common, and as an instrument of cooperation, regardless of the purpose of the agreement. In the processes of farmation and management of the cooperation agreement, the ICTs have a significant relevance in facilitating infarmation and communication necessary to achieve that purpose. Improvement in ICT offer high-capacity tools which have become a factor, whose aims is to provide competitive advantages to organizations by allowing them to operate in an integrated collaborative environment. The use of these e-business tools far collaborative purposes provides flexibility on the exchange of infarmation between organizations, and joint decision-making processes between the different working groups.

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