

12TH INTERNATIONAL COMMAND AND CONTROL RESEARCH AND
TECHNOLOGY SYMPOSIUM

“Adapting C2 to the 21st Century”

Information and Knowledge Management as Competitive Advantage Sources
in Information Age

- Interoperability among organizations;
- Knowledge centred organizations vs knowledge based organizations;
- Self-synchronized organizations.

Organizational Issues

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Abstract

Information and knowledge have an increasing important role in organization's performance. In the so called information age there's an emerging tendency to seek and develop tools that allow organizations to reach and keep a competitive advantage. Competitive Intelligence rises as a response for this search but, as can be proved, its simple implementation is not enough. There are other solutions – the organization, itself, will have to change its structure and attitude concerning its surrounding fields of interest, where it operates.

The competitive environment between organizations has become more tumultuous and very dynamic. Information, and knowledge that can be generated from it, have become essential resources for all organizational activities. Management processes are following the internal and external environments tendencies which lead decision makers in the right way. Effective management procedures used today may lead, a few months later, to a complete ruin. Concerned with this situation, organizations should developed methods and techniques that allow them to survive in a marketplace or even in a battlefield.

Key Words

Information Management; Knowledge Management; Competitive Intelligence; Self-synchronization.

INTRODUCTION

In such a competitive and complex environment, cooperative relations at internal and external level may become a powerful weapon against other competitors. These relations can only be better performed if the organization is capable to set up a cooperative network, change its internal structure, embrace communication's standards and learn how to build situation awareness and situation understanding based on information and knowledge sharing. Beyond the establishment of cooperative relations, it's also necessary to learn how to work in groups and networks which implies the development of the necessary

flexibility to respond faster according to new environmental conditions and relationships.

Synchronized actions are faster achieved if organizations are able to coordinate all its resources in an effective way. The finest coordination capability, able to respond to the most critical situations, can only be reached in organizations where all its members are subject to periodic professional training and education, in organizations that clearly disclose its business strategy to its members, share high quality information and follow a thrust politics among all its members. Additionally, organizations business process may also be affected at a global level by international events and Information warfare activities. Everyday, alert systems are being optimized trying to anticipate the effects of those events and try to identify possible emergent risks and opportunities. Simultaneously, information analysis processes and protection mechanisms are being created.

Within this context, success will only be accomplished by organizations that are able to implement mechanisms that, for some means, can give them competitive advantage over others. This paper intends to identify what kind of tools and methods have been developed by commercial and military organizations and the way that they should be used to generate competitive advantage in the information sphere.

1. INFORMATION AND KNOWLEDGE MANAGEMENT

The Information's volume, produced and manipulated by organizations, is so high that is vital to understand the way it flows through the organization, where it is necessary, who need it and how it is used and transmitted. Therefore, it is necessary to implement some models that represent all existent information flows across the organization's structure.

In this way, it must be created information maps, communications and networks maps and technologies maps. The first ones are built for all business processes and allow decision makers to coordinate, in a better way, the information needs and to carry out strategic planning with better effectiveness. The use of this kind of maps can reveal some information, available inside the organization, which is not currently used in the most advantageous way. If, in one hand, is essential to record all the available information, it isn't less

important to know how it circulates and what are the generated information flows dependencies. Communications and networks maps give, exactly, the answers to this question. Technology maps provide information about all implemented technological means in the organization and must show a precise picture allowing managers to understand the implications imposed by technological limitations and also opportunities powered by its capabilities. Information compiled from all this kind of records make possible to detect possible opportunities and bottle necks in organization's information flows. In addition, it is possible to identify the information which is necessary to transmit and the available systems and means to broadcast it. Picture 1 shows a possible way to represent all the information provided from the referred maps. In this example, we can identify a bottle neck described in the second line of the matrix (blue square) – used resources spent almost the entire system capability. In some circumstances, information convergence in one single actor may also cause disorder in information flow (red square), which also can be a bottle neck with enough power to affect all the system effectiveness.

Source INFO Actor	Destination INFO Actor	Used network resources (%)	Information type delivered	INFO Volume delivered	Observations
Chief of Staff	Force Commander General	77	Enemy Reserve Activities	50 Mb	Daily
Platoon Leader	Squad leader	98	Enemy location	1 Mb	Permanent
Platoon Sergeant	Squad leader	37	Ammunition supply	800 Kb	29SMC4368
...

Picture 1 – Information flow matrix.

In addition to internal framework, modern organizations must have international concerns. More then ever, global events can condition regional and local market-places and consequently influence organization's strategy. Needfulness for global information sources is rising, so it is necessary to think in a great deal of information integration and management solutions to increase its value. Competition rules are being changed by telecommunications and information. To manage information, knowledge and changes to implement in the

organization is essential to its survival. Knowledge is a vital resource which every day gets a greater value. In the so called Knowledge Society, this resource gains equal importance as traditional resources such as: economic, geographical spot and financial assets. Organizations must strongly invest in professional qualification and modern management measures heading for products and processes innovation. In this manner it will be created proper conditions for technology and knowledge exchange. On the other hand, it is also necessary to create a network capable to support a large number of decisions and knowledge making, capture and inclusion operations at organization's hierarchical lower levels. In order to correctly perform all this actions, in a synchronized way and according to organization's interests, the network must be capable to pass on to all its users the approved strategy. Top management must be able to communicate with the lower organization's levels so that decisions can be in harmony, perfectly consistent in a crossed way. Creative initiatives must be stimulated in every single individual and they must always search for better and continuous professional graduation. This way, it is created a privileged environment for knowledge making, but it isn't enough. In order to Knowledge creation takes place, organizations must be aware of changing needs, development of its key competencies, test new solutions, learn with the surrounding fields and always search new challenges, embracing management processes that generate identical processes at individual and collective levels. Organization must not fall in monotony making its business processes repetitive, following the vision that what is resulting must not be changed, and it must not feel uncomfortable with innovation, it must be part of its daily activities. Only then it will be possible to generate knowledge. For instance, if a driver goes from home to work and work to home, using always the same road (because he's afraid to try new ones and get lost), he will never know others. One day if a big accident happens in he's usual route he will panic and come late to work.

Knowledge management must be able to deliver large cooperative information quantities and transmit the best technologies and practices. It must allow identification of all organization's knowledge assets and become a new knowledge production tool, generating therefore competitive advantage.

2. COMPETITIVE INTELLIGENCE – COMPETITIVE ADVANTAGE SOURCE

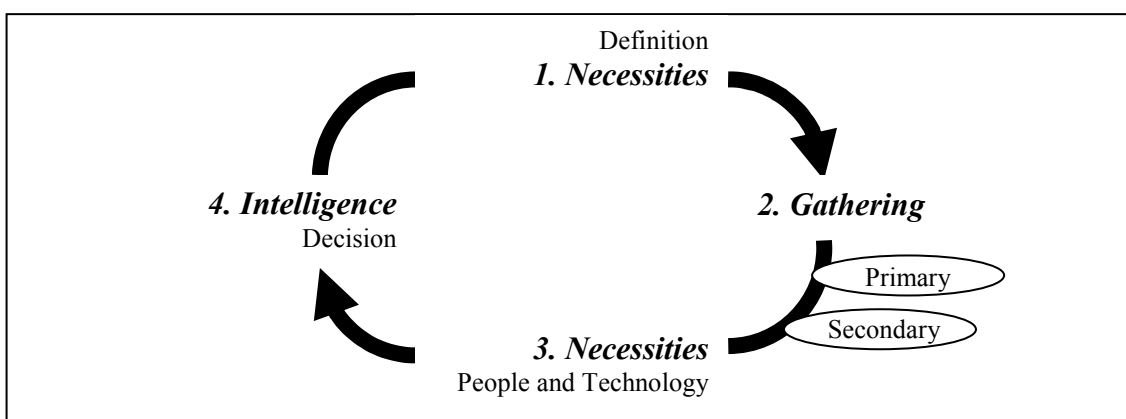
An effective information and knowledge management doesn't necessary generate competitive performance. Organization may have the know how and be surrounded by specialized human resources, may also have large years of experience in its business field and may know all marketplace tendencies but if it is unable to know what its competitors are doing, be aware of possible marketplace wavering and try to predict solutions for different possible situations, that may occur, won't be able to survive in its surrounding business fields. Present background, in which organizations operate, is very dynamic and the impact of some specific events can lead them to ruin. The risk is higher and the allowed number of management errors is shorter. Therefore it is necessary to create an alert and analysis system for the manager's decision support process that, above all, prevent managers to be surprised with marketplace's new developments.

2.1. Competitive Intelligence

Competitive Intelligence "is the organization's attitude that leads it to be aware, in a continuous way to all aspects, trying to understand and respond to signals from the surrounding field. And respond means to decide." (Taborda & Ferreira, 2002, p.12). Decision, within this context, will be more effective if the product's quality of competitive intelligence process is high and if it is considered the correct timing, because good decisions can only be made at the proper time.

Precision of all competitive intelligence process products can only be assured if a systematic methodology is implemented in all its operations. This methodology must be used at all levels, starting with large organization analyst groups and ending at a modest organization's decision maker mind. Thus, as it can be shown in Picture 2, competitive intelligence starts to identify the type of information the manager needs to take a specific decision, or a set of decisions, and establish its correct timing. At this stage, it is vital to precisely define all the necessities in order to assure, at the end of the process, a correct answer to all the questions initially made. The second stage consists in rumour clearing up and information gathering about events occurring in organization's surrounding fields. Gathering must be done based in all available sources: people (primary

sources) and printed and electronic sources (secondary sources). The next step involves information analysis and interpretation which results in contextualized information, that is, intelligence – it is the most critical stage of all process where, in general, happens the biggest failures in competitive intelligence, because analysts were unable to apply a coherent methodology. This situation may be generated by analysts lack or even by some of them that only concern in writing something, without any value, where it is neither identified the event's implications nor suggested possible recommendations. The last cycle stage comprises the analysis results (intelligence) dissemination. Recommendations must get to the decision maker, at the right momentum, in order that he can consider them when he will take the decision.



Source: Taborda and Ferreira (2002, p.36)

Picture 2 – Intelligence Cycle.

In our days, everyone can easily access information. There are available huge information quantities, distributed for several open sources that can be visited by public users. Individuals only need to make a simple web search, in an internet search engine (like Google, for instance), to be flooded by information of all kind that is, somehow, connected with the introduced search key. The secret consists in selecting the information that really matters and, consequently, proceed to its treatment for better decision making support. Competitive intelligence activity involves, therefore, research and information exchange in a systematic and horizontal way. The process never runs away from the organization's holistic view and always considers the singularities of all organization's sectors. Its main goal is to identify and analyse the risk sources that can affect the business in order to prepare an appropriate response, at the proper time. Response's effectiveness to threats and opportunities will be

greater if competitor's identification is accurate, event's analysis (from organization's surrounding fields) is precise – for instance: a client in the edge to go bankrupt, a supplier that became the only one capable to provide a specific type of component (has a big influence power over the others organizations) – and if the determination of who needs to know what is happening is very fast. In addition, effectiveness can also be increased by the ability to understand to whom the information is useful and what type of decisions must be taken in case of that eventuality occur.

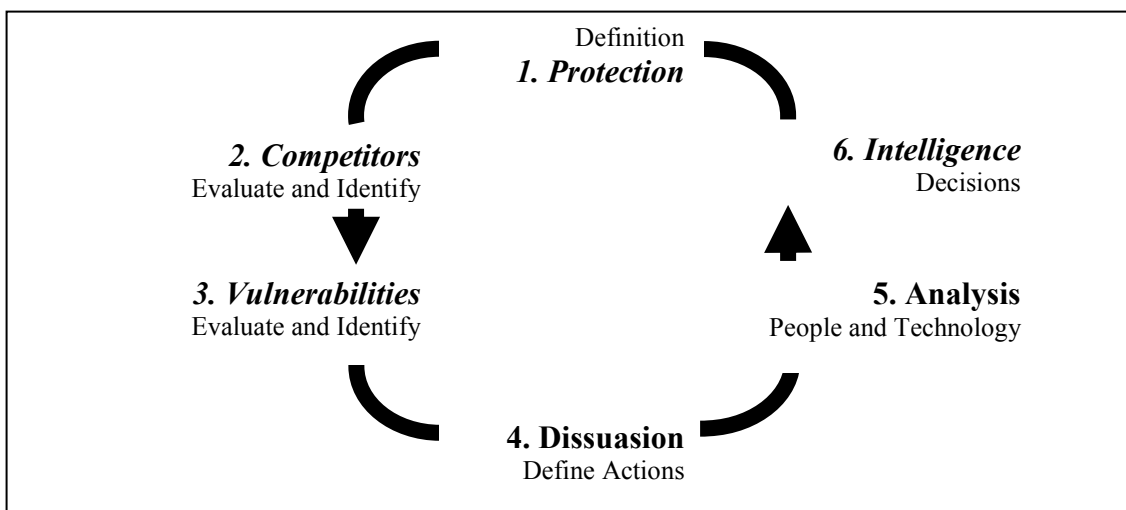
Competitive intelligence activities are constantly associated to industrial espionage and other suspicious activities (with questionable lawfulness) because it deals with information that, almost all the times, is secret. Some major organizations used detective enterprises to investigate their competitor's activities. A few investigators were caught fingering the opponent organization's rubbish. These methods came to public press as making part of competitive intelligence activities, which is absolutely wrong. The same happens at the governmental level. Large number of countries ignores ethic and legal principles in their investigations and information acquisition activities when the State's National Security is in risk. This kind of operations is not competitive intelligence, it is pure espionage. The big difference is that legal aspects are followed and the profession's ethic code is respected – the code is tutored by the Society of Competitive Intelligence Professionals (SCIP). Therefore it is important to assert that, in spite of competition be very tough, there are rules and legal obligations that impose limits in some considered dark methods and means implementation.

2.2. Counterintelligence

If for one hand is essential generate intelligence for the other hand it isn't less important establishing which kind is critical. Organizations that neglect this matter will give an easy work to competitor's competitive intelligence professionals.

Within this context, simultaneously to competitive intelligence cycle, must run a counterintelligence cycle that, perfectly integrated with the first one, will produce high value results avoiding damages, sometimes severe. According to Taborda and Ferreira (2002), counterintelligence cycle shares with the first one

the initial point (contact with the decision maker) and it is worked in opposite direction, as it can be seen in Picture 3. At this point there are defined the intended protection requirements and identified the most critical information. It is important to understand that it's impossible to protect everything. The attempt may result in protecting absolutely nothing relevant. Information to be protected must be the one that, possessed by competitors, may lead the organization to a disadvantage position and to a profound learning about it. The cycle's second phase tries to identify competitors that may be interested in the information, which its requirements have been defined in the previous phase. Beyond this identification, it is important to estimate its information assembly and analysis capability – that is to evaluate its competitive intelligence function capability. The third phase tries to identify and estimate organization's vulnerabilities, according to competitor's capabilities, encountered in the previous phase, and information sensitiveness degree. At this point, counterintelligence team must know, exactly, what must be protected in the organization and against whom it should be worried about. In the fourth phase are defined the actions that must be taken to deny competitor's competitive intelligence activities. In addition, it is fundamental assessing its (actions) effectiveness in order to secure the defined requirements satisfaction allowing improvement procedures if necessary, in case of requirements dissatisfaction. This assessment is done in the fifth phase of the cycle and also enables a deeper knowledge acquisition concerned with competitor's information gathering patterns. Finally, it is essential that all counterintelligence cycle products reach the proper destination at convenient time. It's importance degree is comparable to competitive intelligence cycle last phase but, in this case, results diffusion are reflected in decisions that will influence the way a specific information will be manipulated in the organization and how it will be protected.



Source: Taborda and Ferreira (2002, p.185)

Picture 3 – Counterintelligence Cycle.

It is also important to refer that any counterintelligence action will only produce benefits if all organization elements feel “part of the team “and be aware of cycle’s implications. For that reason it is important to pass on and stimulate a security politic. Organization must strongly bet in proper diffusion of its entire counterintelligence program. The idea is to make that adopted measures be implemented in organization’s all they activities. Its elements must constantly keep up their attention focused in risks that may affect organization and events that may have an effect on their professional papers, in case of critical information leak.

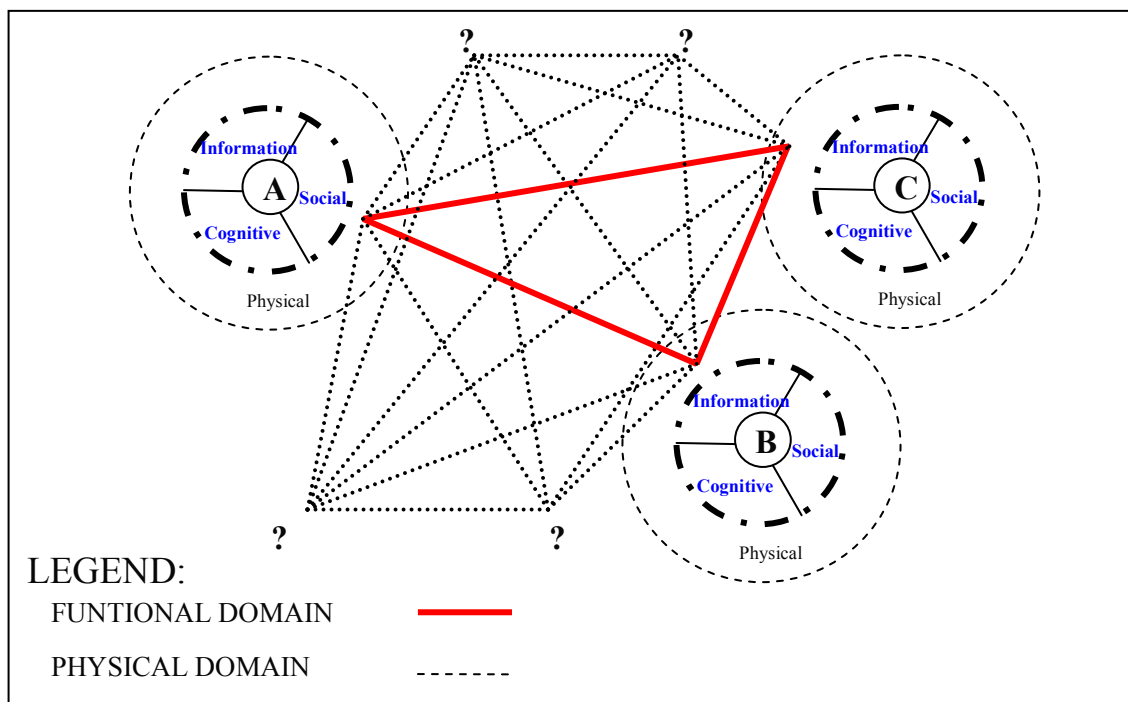
3. INTEROPERABILITY

Being aware and capable to decide just in time is not enough, it is also necessary to be able to perform agile decisions. Competitive advantage generation over competitors is, in some way, dependent on organization’s flexibility which contributes to all systems integration. Flexibility reinforces its capability of connections establishment with other organizations, at national and international level, according to its interests. This aspect may shape one way or another, its structure that tend to regroup in modulated substructures. Thus, there are quickly established cooperation relationships between organization’s departments and other organizations. Established relations represent assumed commitments that can restrain organization’s negotiation power. Therefore the establishment of those relations must be a very pondered and aware operation.

Flexibility, in this point of view, is a feature booster of joint work, it increases the capability of interoperate with others. Modern organizations are facing growing complexity situations that generate the necessity of information share and stimulate cooperative work. When the word interoperability is used in some speeches, it can be understood as a feature that can be reached by defining, previously, what peaces of information should be released and what kind of relations should be established with other organizations. Such understanding is, absolutely, wrong and its implementation would be ineffective because situations are very volatile and events take place in an extremely fast way. It is impossible to know who will need a specific peace of information, the exact momentum of that need and who will have to work with whom. One first possible solution would be giving access permissions to all the available information and a second one would be the establishment of relations with everyone. The right choice must involve a little bit of both. The idea is to create a system that in its initial state is similar to the first solution and, as it is impossible to know who will need to speak with whom, speed up relation's establishment. The system must be capable to reconfigure the network, in a dynamic way, according to incoming needs. The same must happen with the organization's processes that must be, sufficiently, suitable as its participants and respective papers in organization concerns. It is also important to refer that interoperability must be built at organization's internal level for then be, more easily, extended to other actors with whom it have been established cooperative work relations like soldiers, reconnaissance units, combat support units, car industries, marketing agencies...

Interoperability level can only be effective if it is taken at all level. At the physical level (physical infrastructures level of implemented systems), organizations must connected through a network. In one hand, each one must be capable to share information to all net members and, simultaneously, search, recover and understand the available information (cognitive domain). On the other hand, net members must be capable to take a part in cooperation virtual environments (social level). Picture 4 represents interoperability domains were it is possible to identify organization A, B and C interconnected. The way they are represented shows its interoperating capabilities in a same or among different domains. For instance, organization A may send its understanding about a particular situation to organization C that collects it in a form of

information and applies it in a cooperative work with organization B. Presented network tries to represent one infrastructure that allows the establishment of pre-settled connections that, in case of need, speeds up new organizations or organization's departments interconnection and the establishment of new connections.



Picture 4 – Interoperability.

Every single organization only needs a network connection to receive information. To understand it correctly they need, in addition to a network connection, a semantic interoperability and knowledge share. This is the fact that differentiates applications interoperability from data interoperability. This last one eliminates uniform format requirements and can be reached if all users are aware of all types of data representation. Data interoperability gives more flexibility to the system because it can accept and establish relations with different types of organizations. Network users who release information must do it in such a way that major users can understand it or, using its own format, pack the information with additional elements to be used in its interpretation, according to standard patterns. In this case, organization that intends to use its own format must learn and recognize all the other forms of information representation used by their sources. This way, it is possible to keep interoperability among standard systems and others with its own architecture.

Organizations unable to interoperate, or with serious interoperability limitations, will not earn the right to access all the available information, its information provider capability will be very weak, it will have difficulties in information understanding and will not be able to develop cooperative work with other organizations. This inability will lead to connection disruption from the created network, because organization is useless to the system, it doesn't increase system value. Without this capability, situation share and situation awareness can not be established. Relations between organization and system network will be destroyed and consequently organization will lose its competitive power over its competitors.

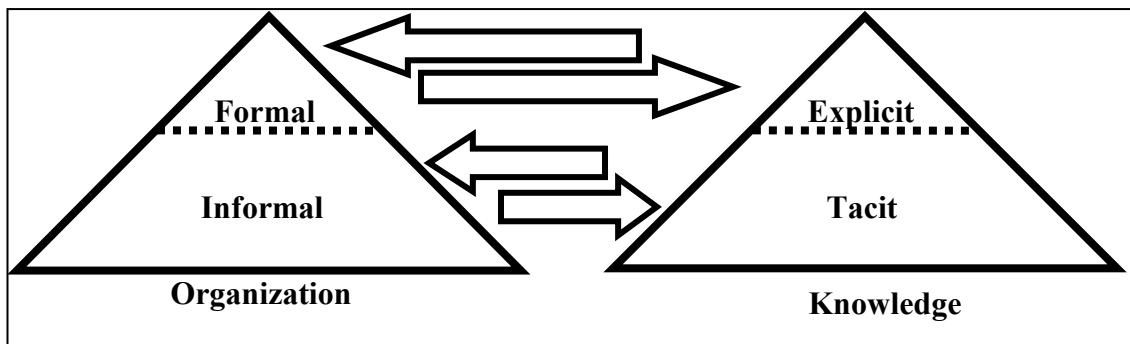
4. KNOWLEDGE BASED ORGANIZATION

In spite of knowledge issue has been already mentioned at the beginning of this investigation, it is now important to specify the way organizations should deal with knowledge and try to relate it with the preceding concepts.

It is clear that organizations must have the capability to evaluate its surround fields of interests in order to anticipate possible damages. They must have courage enough to call in question daily practices that, until now, had perfect results and, above all, organizations must learn how to learn. This apprenticeship involves knowledge production and transmission. This, along with the physical and financial assets, generates value in the organization, by what it must be faced as a valuable competitive resource. Organizations must make an effort to remain itself, constantly, in the knowledge head. This task can be very difficult to accomplish because knowledge is inexhaustible and also can be used by the competition. In this perspective, it is vital that organizations can be capable to create and preserve methods to optimize this knowledge.

In a simple way, what it is intended is to stimulate the human resources, betting in continuous graduation, and then convert it into organizational assets (using documented processes and knowledge databases). According to Sousa, Marques, Tavares & Cavaco (2000), the knowledge and the organization's structure can be understood in accordance to an iceberg type model, as it can be seen in Picture 5. The organization's formal portion corresponds to the iceberg's visible area and the informal one to the submerged portion. This last one supports, influences and commands the first one. The same can be

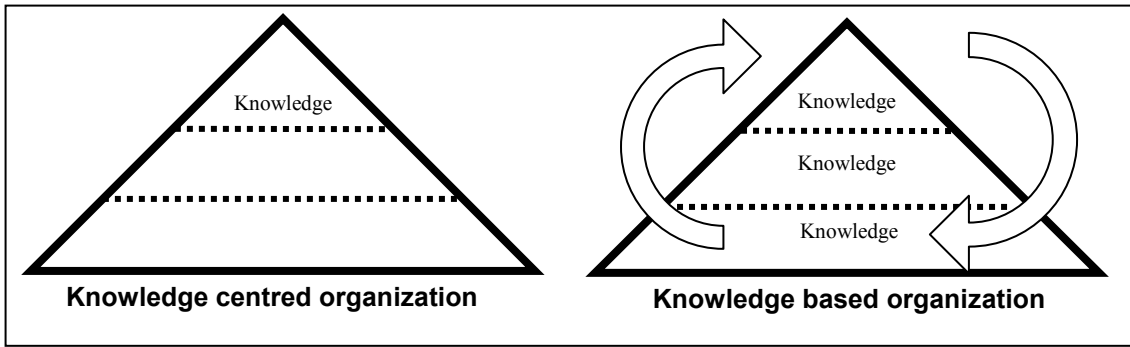
concluded about the knowledge. The iceberg's visible part corresponds to the explicit knowledge and the invisible one to the tacit knowledge.



Source: Adapted from Sousa et al. (2000, p. 12)

Picture 5 – Organization's and Knowledge Iceberg.

It can be perceived that the tacit knowledge weight in organizations is very big. The explicit knowledge is supported by the tacit which can only be found in people's minds. Therefore, it is important to constantly bet in human resources graduation and their respective exclusiveness (inside organization structure) for a convenient period of time, and in the development of ways of knowledge externalization, internalization, socialization and combination. The demanding competitive environment compels to rethink the way this resource must flow among organization. Until recent time, the great majority of organizations were composed, essentially, by two distinct blocks - those who thought and planned all the activities and the ones who executed them. This model was based in knowledge centralization, as well as its share and diffusion, only among organization's high structure. The problem is that, more than ever, there's a need to take decisions at hierarchy's lowest levels, at the operational level. Moreover these decisions, which in a soft analysis could be rated as minor decisions, can be armed with enormous strategic value. In this way, in order decisions be lined up with the business strategy defined by top management, knowledge must flow among all levels. Picture 6 demonstrates the difference between knowledge centred organizations and knowledge based organizations.

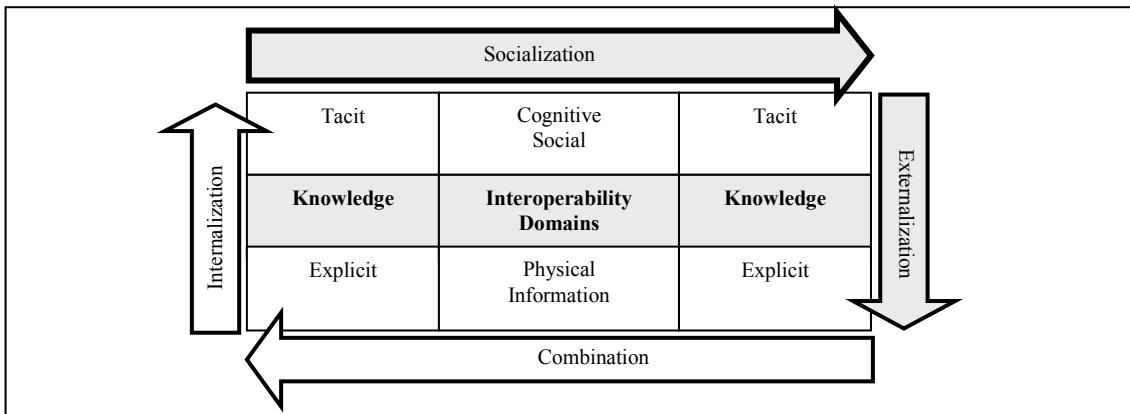


Source: Adapted from Sousa et al. (2000, p. 15)

Picture 6 – Knowledge centred and knowledge based organizations.

In this way, it is possible to create a unified structure designed to conduct and execute, at all levels, the defined business strategy without losing the particular contributes of each organization’s agencies.

Knowledge based organizations with high interoperability levels will be able to, more easily, absorb, produce and spread knowledge among its all structures. The production cycle of this resource will be faster and its contents will be richer. Picture 7 intends to relate the knowledge cycle with the interoperability domains.



Picture 7 – Knowledge cycle and interoperability domains.

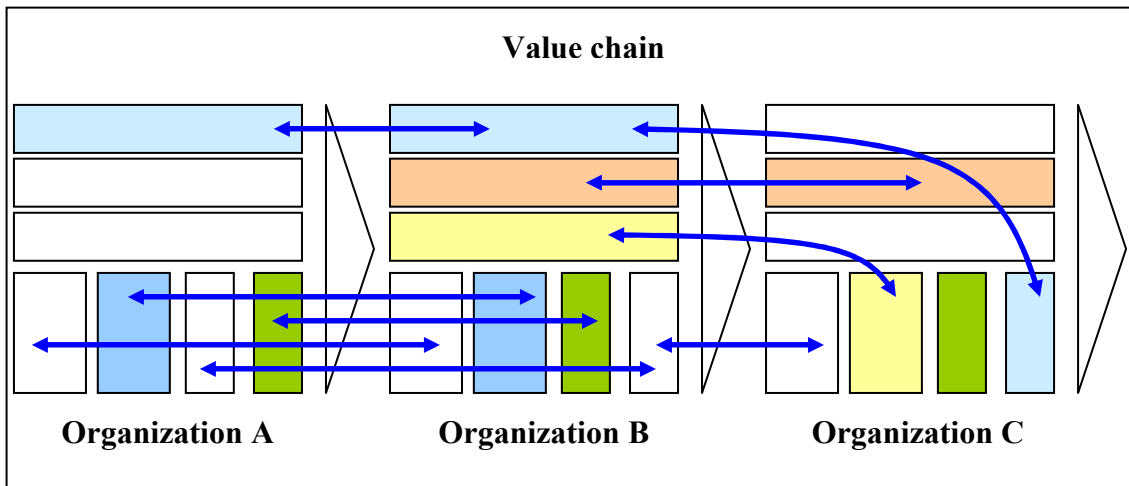
All organizations, one way or another, do knowledge combination. Explicit knowing is more easily accessible, even though in some cases it is well protected. Main difficulties are faced in tacit knowledge that can only be found in human assets. Efforts must be done to maximize this asset through externalization, in order to record collected knowledge, and invest in human assets graduation through internalization. Moreover, it is necessary to open ways so that people can communicate and share their experiences. It is,

precisely, here that strong interoperability levels organizations gain advantage over the others. Its predisposition and structure promotes socialization processes enriching thus all the knowledge cycle.

5. SELF-SYNCHRONIZATION

Time is money. This is a well known expression that is based on the fact that not optimized resources, in time, conducts to inappropriate opportunities exploitation and respective loss of profitability. In a world of so intense and complex production rhythms, organizations cannot allow that its collaborators develop work in different timings. This fact leads to unproductive resources management and consequent loss of competitiveness.

Interdependence of some organization's processes reaches today levels that demand, many times, what it can be called "Swiss clock" precision synchronizations. One imagines, for example, what can happen in an assembly line when a delay occur in one single production station. All the line is affected and will suffer a delay that could be or not proportional to the one from the station. The same happens with work rhythms of suppliers, retailers, producers... and when we speak on international organizations, the synchronization lack, the concertante engagement incapacity of its resources, may have serious consequences. Picture 8 intends to represent the existing interdependence between the different activities of organization's value chain. Easily it can be concluded, for instance, that the organization's primary activity failure (represented by colour green) affects the primary activity of organization B that, in turn, disables it of organization C. Therefore, it is important that organizations can be capable to take its agencies to respond in the right timing, face to one specific event, so that it can answer, with the same adequateness, to external events.



Picture 8 – Value chain interdependencies.

The fact of an organization to be capable to synchronize answers places it in a very reasonable level, in what competitiveness is concerned. But, current involving fields of interest requirements impose the implementation of even more efficient mechanisms. Organizations must take a step developing self-synchronization mechanisms. Many situations demand that important decisions must be taken almost immediately, having not enough time to report the event to the management entities immediately above. Organizations must have, at all levels, freedom enough to take decisions and have access to the necessary means to do it. It is vital to have the notion that, sometimes, it cannot be possible to communicate with a company branch at a critical moment or the volume of information and amount of decisions to take can be so high that, concentrate them in the headquarters, could result in collapse of its entire decision mechanisms. The same is valid between agencies of the same organization. These must be capable “to think for itself” and to take decisions without previous top management approval, without differing, of course, from the defined strategy. Reaching this degree of synchronization is not easy. The risk of disarticulated response is very high. In some situations an organization agency can, unconsciously, compete or compromise the performance of another one belonging to the same organization.

Self-synchronization is achieved when all organization collaborators have a clear and consistent vision of the designed strategy, when exists the capability to share high quality consolidated information (intelligence) and joint situation awareness. Self-synchronization enabled organizations are able to reach high reliable degree of information diffusion, have high quality processes and

professional collaborators and demonstrates well proved efficiency at all levels. In this situation, the top management will not have problems to apply decision empowerment to their agencies and collaborators. This procedure will lead organization to become much more agile and flexible to unusual situations.

CONCLUSIONS

In the past information sources were limited. This fact was explored by people who had the ability to collect it, releasing only partial contents. It was already clear that who owned information, had the power. Technological improvements allowed more then ever, the dissemination of great amounts of information for lower prices. For the same reason, access and research costs decreased substantially. Suitable conditions for the establishment of inter-organizational systems were created, due to descending of information costs and on account of the possibility to share information systems implementation costs. Knowledge and information “monopolists” saw its empires falling down owing to this easiness to communicate. Information power achieved new dimension and became the leading factor in the value chain of almost all the products and services, currently available. Information and knowledge management had gained a preponderant weight in organization’s processes optimization.

It is necessary to proceed to proper information mapping for better understanding of who needs it, the way it flows and to identify possible system’s bottle-neck and opportunities. In similar way, mapping knowledge assets looks for engagement optimization of its human resources. The correct management of this asset allows the development and implementation of knowledge production processes and its preservation. Moreover, organizations must have the capability to survey its surround fields, with the perfect notion of what can be a risk or an opportunity, and to foresee solutions for possible scenarios that can be generated. Competitive intelligence appears as a tool designed for the satisfaction of all contextualized information needs that provide support for decision making. Simultaneously, counterintelligence bursts as a defence weapon against competitor’s competitive intelligence. Its objective is to identify which information is critical, find out the way it must be protected and create security practices involving all organization. In information warfare, counterintelligence capability is essential. To deny critical information and

release contents that take influence over competitor's strategy definition, leading him to a disadvantageous situation, constitutes one of the most important qualities of competitive organizations.

On the other hand, organization's surrounding fields of interest are so dynamic that created an imperative need of bigger connectivity and interoperability, in order to develop collaborative processes. This environment imposed changes at organization's structural level leading it to a hierarchic structure "flattening". Its network nature was gradually growing to a new vision. Network is no more controlled by the top management and starts to be handled by its users, reaching an auto-coordination level. All the necessary connections must be established leaving the possibility to create new ones that can turn out to be important. That is, the installed network must foresee the establishment of future relations and the type of information needed and must allow the constitution of others, that in the future can turn out to be fundamental.

This organization's structural change also causes a change in the way that knowledge must be faced. With the purpose of decisions to be lined up with the strategy defined by top management, it is necessary to let knowledge flow among all organization levels. In this way is obtained an intelligent structure that quickly decides, act and integrates the knowledge acquired meantime. This situation creates a propitious environment to self-synchronization because each part knows exactly what to do and when to do it, in accordance with its functions, and in a coherent way with the holistic view.

Military organizations integrated, in a similar way, the solutions that, meantime, emerged. Information and Communication Technology (ICT), with specific particularity, were also embraced by Armed Forces. Long time ago, was perceived that the ownership of suited information can dictate victory in the battlefield. In this perspective, some country's Armed Forces have been developing systems and doctrine that allow them to disseminate efficiently the available information and the application of acquired knowledge in other conflicts. The expression "lessons learned" has today unquestionable presence in military vocabulary and refers, precisely, to knowledge accumulated throughout large number of military operations. It has been made efforts in order to totally digitalize a military force always keeping in mind, however, that digitalization is not the secret for success but it is a fundamental ally to obtain it. Thus, it is possible to increase a force combat potential not by its complete

digitalization but using specifically designed ICT to do the job. In order for this implementation be successful, its structure and ways to operate in the battlefield must obey the principles identified until now. The units in the field must be capable to access the available information that its need and to transmit in real time new developments, through the net work built for the purpose. They must have in its organization agencies with the capability to survey the enemy forces, producing contextualized information (intelligence) and, at the same time, able to deny considered vital information for the current operation. This capability is expressed in intelligence cells, electronic war units, recognisance, psychological operations, etc... In addition to this competence, all units must be able to interoperate. This fact implies that all must be built in a similar way at structural and functional levels. The network must allow new units fast integration and transmission of new types of information, in reply to a completely different situation from the foreseen one. The force command must not centralize the acquired knowledge. He must apply it in its units training and release it to network users. In recent conflicts in Middle East, it has been observed this type of initiatives. The American Armed Forces constructed replicas of Iraqi cities with the purpose to train, in a better way, its troops having in account the experiences lived in the past.

Technology used, currently, by forces in the field allows Force Commander to observe, in real time, all movements of any one of its soldiers in combat. Temptation to centralize control can be great but, it must be strongly opposed. In the modern battlefield, the units must have self-sufficiency enough to take isolated decisions, as soon as they respect the established strategy and superior directives. The available time for decision making, lesser and lesser, is not compatible with the typical pyramidal structure. Many decisions will have to be taken in the field and almost immediately. Unit actions can be, in a moment, armed itself with strategic importance for the confrontation resolution. It is, therefore, essential that all be able to, autonomously, synchronize operations in the field that, apparently, have no unique command, deploy concerted actions according to defined strategy.

This performance level can only be reached by high flexibility organizations, composed by capable collaborators with the ability to quickly adjust themselves to new realities, dominating a vast amount of structures and organizational papers. In such a way, enterprise or governmental nature organizations will be

able to boost its competitiveness or combat potential over its opponents, to assume different forms, in accordance with its surrounding fields, to develop external situation awareness, to increase its joint work capability levels and to conjugate all the necessary means to reach its objectives.

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