REACH EFFICIENT COLLABORATION

How to transform your company to gain competitiveness in the 21st century.

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Abstract

Globalization implies an increasing competition among companies, requiring them to innovate faster. To generate innovation, firms need to readapt their organizational structure. Transversality and the concept of project-oriented organizations follow from that idea. Indeed, a flattened organization structure needs to be installed and supported by suitable information systems, decompartmentalizing the firm. These technologies allow companies to generate virtual collaboration among world-spread teams.

But such mutations imply new managerial stakes, affecting the management of the organization as well as the management of people.

The overabundance of information shared when trying to catch employees' knowledge can in fact reduce the organization performance. Organizational boundaries have been stretched-out and collaboration among competitors will increasingly grow, impacting the need to be clear on what information to give to your enemies, and what degree of collaboration to maintain if you want to keep competitiveness.

Human management is also impacted by the need to collaborate. Decision-making process is flattened and decision-makers need to consider much more decisions before taking the final decision. A correct information system allowing people to interact and acquiring critical information is a key asset for a good decision.

Because information is shared and the hierarchy slimed, the authority and power is dissolved. Current managers will see their authority decrease and will have a new role of coordinating and creating the conditions for their employees to share the knowledge and collaborate efficiently.

Because everyone will work with each other and because of the apparition of virtuality, the need to belong to a group is not as satisfied as it should be. Again, the adequacy of technologies is a key factor to mitigate this phenomenon. Management will need to create a context of cohesion.

Elements and factors of a new collaboration approach have been presented by several theorists. Information Systems must be developed by a community representing the diversity of the organization and integrate new elements such as tagging systems, or automatic signals to users (RSS) to be really efficient.

We also need to select appropriate information and not to be submerged by its overabundance. Fast research modules and rating methods can overcome this bulimia. Tools must be comprehensive and user-friendly to be easily adopted by employees. To make this appropriation easier, everyone should be a producer of content and have the authority to share his knowledge. Furthermore, it must be the employees' responsibility to set the rules for using shared applications.

But those changes, needed to adapt the company to become a collaborative entity, must be carefully led to effectively reach efficiency. Under-communication of the vision and the

neglect of the top-management to anchor the change securely in the corporate structures are two of the main failures for changing an organization.

Information systems and organization structures must evolve in parallel, because the two are indivisible. Companies have the choice between evolution and revolution but evolution seems to be financially best interesting, even if the risk to create disharmonies in the global organization is high.

Thus, the objective is to generate innovation, through a collaborative company with a plus-value based on the knowledge of its employees. The most suitable organization structure is derived from the matrix organization. It is based on the idea of a democracy where leadership and decision-making process are distributed. It is a matter of a hybrid strong-matrix and circular organization.

But a lot of environmental factors have to be considered and cannot be reduced in turnkey replicable solution.

Enterprise 2.0, collaboration, coopetition, frenemies, flattening, virtual teams… Many words have emerged in today's companies' environments. But where are they coming from? Why do we need to care about them? What do they imply for my own company? Those are some questions we intend to answer referring to well-known and emerging authors. We will first reposition the context in which companies are evolving, then, before underlining some thoughts on how to adapt your company's structure and information system, we will dwell upon the problems resulting from the transition to a collaborative organization.

Change together to lead competition

Innovate or disappear

"The world is flat". That is the report of Thomas Friedman (Friedman, 2006). And that is the order of the world, within which companies have to evolve. We entered a new phase, the Globalization 3.0, following two previous globalization phases. During the first one, countries and governments were the main protagonists. During the second phase, multinational companies drove global integration. In the third phase, the convergence of personal computers, fiber-optic and workflow software enable anyone to compete with anyone. That means that the competitors are widely dispersed and every company, whatever its size, have to compete with companies based in every continent. It supposes a need to be more and more competitive, and to have a constant advance. This implies the need to innovate faster, and to catch the core competencies needed to stay in the race. To do so, structures and main systems, such as Information Systems, have to be flexible, reactive, and need to enable the capitalization of knowledge.

This new competitive landscape is shaped by the technological revolution and increasing globalization (Hitt, Ireland, & Hoskisson, 2001). Organizations need to develop and exploit their innovation process in order to compete in this environment moving fast (Bettis & Hitt, 1995). Among all the possible ways to innovate, effective management of the product development process has been recognized as a critical determinant of entrepreneurial firm performance and competitive advantage (Zahra, Ireland, & Hitt, 2000).

When dealing with product development, companies often choose to focus on the most profitable clients and to concentrate investments where the margins are the most attractive (Christensen, 1997). Here, we are in the logic of sustaining innovations where we improve product performance of established products. However, with such a strategy, organizations allow disruptive innovations to bury them. When disruptive innovations appear (introduction of products with highly improved new features into the market, targeting low segment of the market or totally new customers), organizations keep paralyzed.

Thus, Christensen showed that almost all industries which have been killed by disruptive innovations could have seen the rupture coming.

Indeed, the modification of the environmental context is heralded by the weak signals (Ansoff, 1975).

Those signals have to be detected in order to avoid the sudden inadequacy of the organization strategy and to anticipate the risks of competitiveness. Weak signals are unstructured information, often inexact and difficult to observe or understand.

Ansoff argued that any firm that operates in a high change business environment will have to give increased attention to weak-signals in strategic management practices.

Paying attention to these signals enables companies not to miss strategic innovation. Strategic innovation represents the capacity to re-conceive the existing industrial model so that it creates new values for customers, pushes aside competitors and produces new wealth for shareholders.

But re-conceiving the existing industrial model also means that changes in the new competitive environment have to be deep and constant. That is why new types of organizations appear.

Indeed, one factor which enables the creation of an innovative strategy is that top management should stop the monopole of the strategic creation and integrate more ideas from people of the organization. In other words, management has to approach, create links with all the employees, in order to improve the strategy elaboration process and thus improve its competitiveness (Hamel, 1998)

In addition to the organization structure, the innovation also depends on how well teams generate, import, share, interpret, and apply technological and market knowledge of local markets, economies and customers. The innovation process

requires that the parties involved suspend judgment, remain open to others' ideas and perspectives, and put forth the effort required to integrate new knowledge with existing knowledge (Gibson & Gibbs, 2006).

So we can see that the design of the organization and its sub-systems has to correspond to the environment. It is important not to forget the sub-systems, because different subunits have to be created to confront different external demands, but without an adequate design, these separate departments may create coordination concerns. So, effective organizations do not only adapt themselves to their environment but also between their sub-systems. (Galbraith J. , 1973)

The emergence of unlimited collaboration

So, regarding the new competitive parameters, the functional structure (Henri Fayol), who answered to production challenges, is no longer adapted (Drucker, 1975). That is the same for the federal decentralization structure (Alfred P. Sloan) based on the concept of multiple coordinated divisions with delegation of the decision-making process. Today's structures must decompartmentalize functions to create a transversal project-oriented structure, such as matrix structures (Galbraith J. R., 1971). Those new structures will make people with various competencies work on the same project and coordinate their actions for an improved performance.

Indeed, we observe more and more project-oriented structure and companies. We can define the project-based organization as temporary organizations such as projects and programs to perform business processes and achieve strategic objectives (Turner & Müller, 2003).

These very dynamic structures require different and additional practices from the traditionally managed organization.

The objectives of such dynamic structures are to allow more and more collaboration, required by the new order of the firm's environment. This share of information has been first permitted by face-to-face collaboration within the company offices. But because of the fast emergence of the world competition, collaborations need to be extended outside the company in order to regroup various core competencies of people in various locations. New ways of communications appeared and the model of virtual teams appeared (Townsend, DeMarie, & Hendrickson, 1998). A virtual team can be characterized by four independent characteristics (Gibson & Gibbs, 2006): geographic dispersion,

electronic dependence, structural dynamism and national diversity.

The need to collaborate within organizations and beyond the boundaries increases directly the need for better management information. Indeed, the organization processes the information to reduce the uncertainty and the equivocalness. The uncertainty is the "difference between the quantity of information required to carry out the task and the quantity of information already possessed by the company ". The equivocalness is "the ambiguity of the task, caused by conflicting interpretations about a group or environment situation" (Galbraith J. , Organization Design, 1977). So, when the equivocalness is big, we do not know which question to arise, and when the uncertainty is high, we know which question to ask, but have not the necessary information to answer it. So, when the information increases, uncertainty and equivocalness decreases (R.L. Daft, 1986).

Consequently, the company is by definition symbol of uncertainty, and has to face situations where the risk of not reaching the predictions is high. The uncertainty appears to be the first cause of the need of information. And the organization tries to reduce the number of uncertain scenarii. Thus, that is one of the main reasons to be of these new types of organization and new information systems. They try to answer to this demand of information by mutualizing all the streams of data which circulate in the organization (Prakken, 2000).

This new context and the necessity to efficiently manage information will generate impacts on actual structures. Indeed organizations are not prepared to overcome the extent of these changes.

Anticipate core impacts

Free information boundaries

The flood of information

“Each piece of information is a message sent by a transmitter to a receiver according to a definite code” (Watzlawick, 1972). Everybody is in the middle of a relations network, and even if we decide not to interact with these relations, this silence represents an interaction. That is why “we cannot not communicate”, and more than the message, it is the relation between the actors that is important. So any communication presents two aspects: the content, which is the exchange of information, and the relation, so that the second contains the first one. According to

Watzlawick, maybe only one fifth of any human communication really enables the exchange of information, whereas all the rest is devoted to the endless process of definition, confirmation, refusal and redefinition of the nature of our relations with the others.

Indeed, the content of the human mind can be classified into five categories (DIKW): Data, Information, Knowledge and Wisdom: an information hierarchy where each layer adds certain attributes over and above the previous one (Ackoff R. L., From Data to Wisdom, 1989).

Illustration 1. Information Hierarchy

Data is the most basic level. The data have no meaning of themselves; they are symbols, products of observation which can be done by the humans, instruments or machines. They can be usable or not.

Information puts data into a context. The data have been reworked and have been given meaning by way of relational connections.

Knowledge is the result of understanding patterns in information and the ability to synthesize new information based on these patterns. The knowledge answers the question “how to use it”. When someone "memorizes" information, then he has amassed knowledge. This knowledge has useful meaning to them.

Finally, wisdom allow to answer the questions “when” to use it and “why”. It is the only layer which deals with future.

Thus, as they are usually socially complex and difficult to reproduce, knowledge-based resources can be considered as the most strategically significant resource of the firm. So, heterogeneous knowledge bases and capabilities among firms are the major determinants of better corporate performance and sustained competitive advantage (Grant, 1996).

However, some conditions are required to link information with performance. According to the Management Misinformation Systems theory (Ackoff R. L., Management Misinformation Systems, 1967), information and communication do not necessary lead to a better performance and can even hurt organizational performance.

This is the case when organizational units have inappropriate measures of performance that put them in conflict with each other, which is frequent. Thus, information would be synonym of performance only if organizational structure and performance measurement are taken into account before permitting the free flow of information between parts of the organization.

Moreover, the performance linked to information is sensitive to the media used for the communication. Indeed, communication media have different ability to reproduce the information sent over it. For example, video conferencing can be considered superior to phone call, because it can reproduce visual social cues, such as gestures. In that way, "the more ambiguous and uncertain a task is, the richer format or medium is suitable to it" (R.L. Daft, 1986).Four criteria allow to raise a scale of the degrees of media richness, and the capacity of these media to process ambiguous communication in organizations:

- The availability of instant feedback
- The capacity to transmit multiple cues, such as gestures, or voice ton
- The use of natural language
- The personal focus of the media

Face to face communication represents the richest communication form until the leaflet or the bulletin. Thus managers have to make relevant choices to adapt a particular communication medium to a specific task, its required degree of richness and integrate them to the organization.

On this matter, in his strategy of information in the organization (Prakken, 2000), Prakken defines the links between information and organizational structure. As we previously said, the need of information is firstly there to reduce the uncertainty. And the reason to be of the information system is to answer to this demand of information, by managing all the streams of data circulating in the organization. An ERP[1] is the embodiment of that, trying to optimize the productivity and the synergy of the various departments, and thus trying to minimize the zones of potential uncertainties, the sources of risks. Here Prakken wonders about the levying of the uncertainty, not by the generation of supplementary information but by reflecting on the real need of information. The uncertainty can be removed by taking the perspective of the need of information (upstream) and not the generation of information (downstream).

[1] Enterprise Resource Planning

Indeed, as we previously said, in the actual context, information is placed at the center of the firm. The information systems are more and more numerous, more and more sophisticated in order to provide the managers with information the most current possible.

As a consequence, it seems that managers suffer more today from an overabundance of irrelevant information than from a good deal of information (Ackoff R. L., Management Misinformation Systems, 1967). They receive much more data than they can absorb. If they want to supply relevant information they would spend their time storing and retrieving information; the attention would be focused on constructing data banks, coding, indexing, updating files, using access languages… Thus, managers have as new and main functions: filtration (evaluation) and condensation of information.

However, Ackoff maintains and shows that all documents – for good writings as for bad ones – can be reduced without loss of information.

To avoid collapsing under the amount of information, the organization bet a lot on the ICT[2]. Nevertheless, Davenport thinks that IT systems are successful to process data, but are not sufficient to effectively manage richer information, such as knowledge or expertise. Indeed, information and knowledge management is a determinedly human perspective: the way people and organizations behave towards information. So the technological approach, supposed to solve all the information problems thanks to informatics systems, does not seem to be perfect. The fundamental characteristic of the information is to be used by people. The behavior of people towards the information, the way they perceive it, collect it, organize it and handle it in the organization has a direct impact on the circulation of information and thus on the performance of the company. Information technologies can be useful to influence the practices of everybody towards the information, but a deep change supposes to act on the culture, the formal and informal behavior of everybody in the company (Thomas H. Davenport, June 1997).

The flattening of organizations

The insourcing is the best example of the recent evolution of organizational boundaries. Insourcing characterizes a company in which the employees perform services for another company (Friedman, 2006). The example taken by Friedman to illustrate this point is the one of UPS. UPS itself repairs Toshiba computers on behalf

[2] Information and Communication Technology

of the manufacturer. The work is done at the UPS hub, by UPS employees. This allows the reduction of the laptop repairing time. To do so, Toshiba had to transfer a part of its core knowledge and competencies to UPS. This is a key element for Toshiba keeping its leadership and competitiveness.

Because organizations need to adapt their growth model regarding their objectives, the boundary of an organization will increasingly stretch out. The ultimate step of this boundary enlargement is the extension to extra-organizational solutions (Greiner, 1998). Those solutions include mergers, holdings and networks of organizations. It demonstrates the need to consider the company as a part of something bigger, as part of a global network.

Because of that global networking and the need to constantly innovate, companies must improve their capacity to evolve quickly and to produce rapidly new products. But the capacity is limited by the financial cost of such developments. That is why competitors identified the need to collaborate and share resources to be able to innovate and still be competitive. This is the emergence of *coopetition* (cooperation among competitors) and *frenemies* (friends-enemies). But this causes a serious problem of balancing the acquisition of competencies using coopetition and the need to keep the power and be better than your competitors (Galunic & Eisenhardt, 2001). Competence deals with the resources available to develop projects. As we saw, it is a key factor for innovation and company competitiveness. Competence emphasizes the possession, configuration and deployment of strategic valuable resources. Some of those resources can be found outside the company sphere and a logic based on acquiring competences drives to internalization, which increases the dependence of the company. At the opposite, power deals with influence. It stresses the control of external strategic relationships to reduce dependence and gain dominance. It drives to externalization.

Considering those two conceptions, power usually dominates because the risk of dependence is a key factor for the company survival, and opposed to resource mismatches which limits the competitive advantage (Mayer & Nickerson, 2005). In dynamic environments, both are critical (e.g. technology-based ecosystems) and competence weighs more in the balance.

When a company has no other choice than turning itself to other companies to find new competences, it is because its absorptive capacity has reached its limit.

Absorptive capacity (W. Cohen, 1990) can be defined as the quantity of scientific or technological information that a firm can absorb. In the organization, this capacity mainly depends on individual capacities. Thus, to improve it, the organization has to enable transfers of knowledge across environmental boundaries and across its own subunits.

For instance, Apple and Microsoft worked together for the Mac version of Office; PSA and Toyota created TPCA (Toyota Peugeot Citroën Automobile) to develop common parts for their C1, 107 and Aygo, and share a unique production line in Kolin, Czech Republic.

Coopetition often occurs in technology-oriented industries where rapid technology advances encourage competitors to work together due to advances by other competitive companies, and where cross-over exists between technologies.

Dividing the decision by departments and making decision separately imply an exclusion of several factors known by other departments during that decision process. That kind of decision making process is no longer viable within a business economy where multiple factors have to be considered to take the adequate decision.

This vision is shared by numerous people who argue that the quality and the performance can only be reached thanks to a division of the work between the department and/or the individuals. Only divided structures enable to benefit from the specialization of everyone (Simon, Models of Bounded Rationality, 2 volumes., 1982).

Psychoanalysis of an organization

The wooly vagueness

The decision making model is divided into three phases: Intelligence, Design, Choice (Simon, The new science of management decisions, 1960).

The task of the intelligence phase is to perform information acquisition, combine the acquired information with useful stored knowledge, identify possible opportunities or needs, and present it to the decision maker. The goal is to gain a fundamental understanding and acquire the general information needed to address the organization's problems or opportunities.

The design phase is the period during which the decision maker develops specific and precise models and determines the actions needed to reach the desired state. Thus, he enables the generation of the widest range of appropriate solutions.

The choice phase, or problem resolution, consists in evaluating the alternatives and selecting the appropriate action.

Human beings are rational and when they take a decision they can explain it – they act to achieve goals. Nevertheless, this rationality is bounded since individuals commit judgment errors and sometimes do not achieve the goals they had (Simon, Models of Bounded Rationality, 2 volumes., 1982).

Individuals act according to their environment; and the rationality of the individuals is also limited because they are unable to deal with all the information coming from a complex environment. They act with incomplete and wrong data.

But, even with perfect and complete information, managers are unable to use them perfectly because of the complexity of the decision process (Ackoff R. L., Management Misinformation Systems, 1967). This is particularly true in most management problems where there are too many possibilities to expect and where it is difficult to use experience, judgment, or intuition to provide good guesses. Thus, managers should be provided with either decision rules or performance feedbacks so that they can identify and learn from their mistakes.

The bounded rationality theory (Simon, Models of Bounded Rationality, 2 volumes., 1982) explains this impossibility of the ideal solution. Indeed, the search of the solution does not go as far as the best one but stopped when a satisfying solution is found. But even with a bounded rationality, Simon thinks that individuals are able to face their environment.

However, to achieve the ideal decision within projects, new structure appeared. Among all the existing structures, it seems that the most adequate to project-oriented companies is the matrix organization.

Galbraith (Galbraith J. R., 1971)developed the concept of the "Pure Matrix Organization", also called strong matrix organization by the PMI[3] (PMI, 2003). A full-time project manager is part of a functional department fully allocated to project management, under the authority of a manager leading all the project managers. The team members are taken from the staff members of adequate functional departments and allocated temporarily to the project.

In that kind of structure, there are two ways to take the decision: having a functional view of the decision to take, or a project view. The problem is that project managers and functional managers do not

[3] Project Management Institute

have the same considerations and the same information to make a decision. This can create weaknesses within the decision making process.

The power is out

To make choices and to implement them, the organization is a good way for individuals to express themselves. However decisions are made by organization's members who do not seem to share the same objectives. That is why the efficient coordination of the organization can only be maintained by the authority (Simon, Models of Bounded Rationality, 2 volumes., 1982).

Nevertheless, some structures intend to reduce the hierarchy within a company. This is a flattening of the authority. New structures are emerging like non-bureaucratic structures (Heckscher & Donnellson, 1994). The principle is that decisions are based on dialogue and consensus rather than authority and command. The organization is considered as a network rather than a hierarchy. Other structures like circular organizations (Ackoff R. F., 1989)are based on the idea of a democracy. There is no ultimate authority, power must circulate.

Moreover, the dissolution of power may not be accepted by current managers who appreciate having this domination upon subordinates.

In a learning organization, management is not expected to know what the employees are specifically supposed to do. Their role is to define, create and communicate the conditions in which "knowledge workers" can work (Nymark, 1999).

Value based management is making the employees carry out the correct work assignment on their own initiative without ordering them directly to do so. In that way, it is an indirect management style and the managerial form is not as direct in a flat organization as it is in more traditional structured companies. They are concerned with making a group of people work together towards a mutual goal without explicit managerial pressure and use of power.

Strong matrix organizations are characterized by a dual authority relationship. There is a power balance between the project manager and the functional manager. We easily understand that this double authority can create tensions and stress for team members.

Moreover, these team members feel uncomfortable in double structure where they do not know who they are referring to.

The "whereismyplace" symptom

Maslow's hierarchy of needs (Maslow, 1943) is a human motivation theory which rests on the 5 layers of a pyramid.

The first four levels of the hierarchy (physiological, safety, love/belonging, and esteem needs) are the "deficiency needs" which need to be filled first in order to achieve the last one. Individuals won't feel especially satisfied if the four needs are acquired but they fell uncomfortable if they are not.

The third layer is the "love/belonging/social needs". Each individual must feel that he is accepted, loved and belong to a group. This feeling of belonging can be fulfilled within a large social group or thanks to small interactions. The social need can sometimes be the most important and can overcome the physiological and security needs.

Human beings need to belong to a common group in order to work together. By working as a group, employees will share a common goal and they will be able to fight to transform their vision into reality (Senge, 1990). Thus, they will be able to convert their company into a learning organization.

This is challenged by the proliferation of media which affects the process of communication and collaboration between people.

According to the social presence theory (Short, Williams, & Christie, 1976), a communication medium can have a social impact. This impact will depend on the "social presence" it allows to have. The social presence is defined through different components such as familiarity, immediacy and inter-personal relations. This presence and the social interactions will be more or less high according to the media.

In the same idea, the Social Identity model of Deindividuation Effects (Postmes, Spears, & Lea, 1999) tries to demonstrate that communication technologies, synonymous of anonymity and reduced presence, allow however to interact and to develop a social identity.

Indeed, examples show that communication technologies make "salient" particular aspects of personal or social identity which can be accepted or rejected as human criteria.

Even if social interactions are created, the emergence of virtual teams makes problems of cohesion appear within project teams. Some characteristics of virtual teams, emphasized to improve innovation, can in fact hinder it. Structural dynamism is one of those characteristics (Gibson &

Gibbs, 2006). A dynamic structure is characterized by frequent changes among participants, their roles, and relationships to each other. At a first sight, dynamic structures seem to be interesting for generating innovation because people are not in a stranglehold and can develop their sense of creativity. But dynamic structures have side effects. Because they are inexperienced with the other party they are working with by the time of a project, because they lack of shared history, it is impossible to develop strong relationships and preserve organizational memory. This can increase uncertainty and perceived risks. Because of that unstable structure, it is more difficult to plan and structure the flow of development.

In communication networks, organizations, groups and people are directly exposed to the messages and behaviors of others organizations, groups and people. This strong exposure obviously increases the vulnerability of networks members to develop viewpoints, assumptions and attitudes similar to those of their networks. But in that way, the organization also increases its own vulnerability face to the competitive firms (Monge, 2003).

Because this vulnerability can destabilized all the organization, taking the initiative to change is an imperative.

Move forward: Build your success

Socialize your technology

There is a contradiction in traditional companies which provide highly structured knowledge management systems to capture highly unstructured knowledge work. The strategy to reach effectiveness can be broken into 6 components, called SLATES, which must be the core of the company information system (McAfee, 2006).

The first component is called « Search »: users may be able to find easily what they are looking for, so keyword searches must be a standard (like Google). The second is called « Links »: everyone must be able to create links in order to reflect user's opinion and not be reduced by the opinion of the web developer who built the platform. The third is called "Authoring": most people have something to contribute (an experience, a comment, a fact, an edit, a link) and authorship is a way to elicit this contribution. The intranet platform shifts from being the creation of a few to being the constantly updated, interlinked work of

many. The fourth component is called "Tags". It is a one-word description attached by users, enhancing relevant information search. This leads the apparition of folksonomy (categorization system developed by folks, opposite of taxonomy, the up-front categorization). The fifth component is called "Extensions". The spirit can be summarized by "If you liked that, then by extension you'll like this". It allows the enlargement of the users' vision.

New content is added so often that it becomes a full-time job to see if new content has been published. Thus, the final element of the SLATES infrastructure is "Technology" to signal users when new content of interest appears (like RSS feeds).

These Enterprise 2.0 tools can make large organizations more searchable, analyzable and navigable than smaller ones, and make it easier for people to find precisely what they are looking for. But they do not overcome all dysfunctions of corporate scale.

However, if users of these tools want to find the information they are looking for, they first need to know what they want. That condition seems difficult to achieve since, in order to be able to know what information he needs, a manager needs to know all the decisions he would have to make. Even if managers know the main decision they would make, they will be completely deficient for some others and would ask for all the possible information, so that everything. Indeed, "the less we know a phenomenon, the more variables we need to explain it". The IS designer, who has even less understanding of the relevant phenomena than the manager, will try to provide even more than everything (Ackoff R. L., Management Misinformation Systems, 1967).

No one can specify what information is required until an explanatory model of the decision process and the system involved has been constructed and tested. Furthermore, the analysis coming from these systems cannot yield understanding and explanation of phenomena; they describe and, at best, predict.

So, instead of being information bulimic, the organization has to ask the question of the necessity of such piece of information. Why trying to generate so much information, if most of them do not serve us or do not offer a supplementary relevance to what we already know?

Prakken describes several axis of reflection to answer this questioning concerning the need of information:

- A bad formulation of the problem is a source of a bad allocation of the information.
- As each case is unique and particular, it is very difficult to allow the use of previous conclusions.
- The abstraction is essential regarding the problem; it must be studied in its whole context (zoom out). The zoom out enables to return to the fundamental questionings: why a need of information? The mass of information increases but if we look at the obstacle, is the need of information justified?

This information organization must be studied upstream to the project. This reflection defines a design of an optimized information system, its arborescence, its functioning, and its interactions. It determines the various streams of circulating data, their direction, their size, and so allows to aggregate all the information within an organized and adapted system (Prakken, 2000).

This type of pre-reflection is really important because, many users are not happy with platforms (like intranets or corporate websites) and channels (like e-mail or instant messaging) available to them. Moreover, those technologies do not capture well the knowledge, and one of the reasons is because the production of their content is centralized and generated by a small group (McAfee, 2006).

Technologies must be used to generate, share and refine information. In order to do so, McAfee bid bet on Intranets. According to him, they should become what the internet already is: an online platform with a constantly changing structure built by distributed autonomous and largely self-interested peers.

Moreover, to be totally acceptable, the different tools must be comprehensive and their critic must be possible. For that, managers need to know how their system works and not only how to use it (Ackoff R. L., Management Misinformation Systems, 1967).Without their own evaluation of the system, managers delegate the control of the organization to the system designers and operators who, most of the time, have no managerial skills. They must contribute to the design of the system and nothing should be installed until the managers are able to understand it and to control it.

In the information ecology (Thomas H. Davenport, June 1997), the information and the knowledge, in the same way as structures, culture and processes, are essential bricks for the manager to build an

organization able to implement its strategy. It shows all the importance to replace the management of the information in the larger frame of its environment.

Consequently, it is necessary to adopt an ecologic approach of the information that takes in account its whole environment and not only its technological aspect. To do so, five axis are important:

- Clarify an information strategy: this strategy has to precise. What is the priority information, what to share and how.
- To manage the internal political context: it is necessary to encourage a federal mode of information organization.
- Adapt the culture and the behaviors: it is necessary to encourage the behaviors facilitating the broadcasting of value-added information.
- Establish a network of information professionals.
- Spread a guide of the information sources in the company.

Social aspects of technology use must be preponderant regarding the technocentric view (Desanctis, 1994). Users (groups and organization) dynamically evaluate what the technology systems will bring to their day to day work. These perceptions can vary widely regarding people. Thus, technology will not be used the same way and will influence the group outcomes.

Tame the change

Nevertheless, the design of the system is important but no autosufficient. Indeed for IT systems, the first month following a major implementation is usually the hardest. That is why the implantation and therefore the change are also critical processes.

We can distinguish eight main reasons why change fails in organizations, and therefore eight steps to follow to avoid the failure (Kotter, 1995):

- Lack of urgency: many organizations underestimate building sufficient urgency when preparing change programmes. Managers should clearly communicate how important the project is and how much improvement and efficacy it will lead.

- Failing to create a sufficiently powerful coalition to guide the change. To overbalance from the project status to the operational one, the change must be held by a group of people (project team and

future users) who share a common commitment about it.

- Underestimating the power of vision. The change is the start point of a long-term modification and future orientations. Managers must communicate this vision in a clear and precise way.

- Under-communicating the vision by a large factor. Every member of the organization must be informed about the change. The communication is a very important step; it must be massive and credible in order that everyone appropriates the vision.

- Permitting obstacles to remain and block the progress. The idea is here to identify the potential risk (human, technical, financial…) in order to anticipate them and take preventive and corrective actions.

- Failing to create short-term wins to demonstrate success and to give people a chance to celebrate. In parallel with the communication of the long-term vision it is necessary to fix short term objectives and to judge the good progress of the project.

- Declaring victory too soon. The achievement of the short-term objectives doesn't represent the final success. The change is a success when it is deeply anchor in the organization.

- Neglecting to anchor the change securely in the corporate culture. The modifications done must be part of the organization culture.

By preparing users for this reality, explaining that it will be hard at first but that team is here to help, we create a message that can be believed.

Other recommendations have been made more recently (McAfee, 2006). The use of new technologies is not automatic and depends on decisions made and actions taken by managers.

Managers must make people come to the new tools because there is something of interest already there, not because they are told to, or they will reject the technology, even more if they are reluctant to changes. Managers should also not impose the rules at start: let users auto-regulate them even if at the beginning it seems not working as expected. Too many constraints will lead to a technology not used by the majority. For instance, Wikipedia is a platform where content is auto-regulated by the

community of writers. There is no webmaster approval for the content published but everyone has the authority to edit or delete an article written.

Before accepting or rejecting the implementation of a new system, users evaluate the "perceived usefulness" and the "perceived ease of use" (Davis, 1989). The perceived usefulness can be defined as "the degree to which a person thinks that using the system will increase his work performance". The perceived ease of use is "the degree to which a person thinks that the system will not ask any effort". The two factors are of course impacted one by the other.

Whatever the decision taken by the user, it will be difficult and even impossible to deviate him from his choice. Nevertheless we can think that this freedom of action will be limited by his skills, the organizational structure, the environment, his habits…

Finally, once the new system is accepted, it is also really important for the organization to check how to improve it. The double loop of Argyris is a necessary mechanism to manage changes effectively in complex environments.

He identifies:

- The single loop learning (or adaptive learning)

This type of learning solves problems but ignores the question of why the problem happened.

- The double loop learning.

The second loop uses feedback from past actions to question assumptions underlying current views and thus enables to continually evaluate solutions used against the problems. This loop requires a more important change in the company, notably at the level of its values. It is a positive attitude for the change which underlies that the company questions its values.

To effectively come to grips with the desired situations, it is necessary to align the espoused theories with the theories in use. Double loop learning technique helps the employees learn together and thus the organization change (Argyris, 1978).

The organizational structure must be adapted in parallel and regarding the evolution of the information system. Indeed, the question of when an organization should perform a structural change can be asked. Organizations have two choices: adapt continuously to the environment at the expense of internal consistency; or can maintain internal consistency at the expense of a gradually worsening fit with its environment. The

choice is between evolution and revolution, between perpetual mild adaptation and frequent major realignment. (Mintzberg, 1981)Effective companies usually opt for revolution. It is logical if we consider that consistency, coherence and fit (harmony) are critical factors in organization design.

Quantum structural change is the most economical strategy (Miller, 1982). The central question is financial. The benefits might outweigh the costs of adapting structure to changes in strategy and environment. Because such costs may be high, it might be necessary to delay changing until they can be justified. Such delays can require subsequent revolutionary structural changes. However, incremental structural changes may create severe and costly disharmonies as they destroy an integral structural configuration. Everything is a question of balance between the cost and benefits, in short and long term expected by these changes.

Draw your frame

The structure of the organization must be chosen regarding its objectives. The structure must follow the strategy. It is a mean to reach a goal (Drucker, 1975).

Large machine bureaucracies are perfect for efficient mass production but not for adapting quickly to new situations (Mintzberg, 1981). As we demonstrated, we currently are evolving in a world in constant renewal. Our organizations must change.

Some organizational structures are more suitable to a tumultuous and constantly evolving environment, characterized by the development of activities requiring crossing knowledge workers. Those project activities are opposed to recurrent and stabilized operations (Declerk, Debourse, & Navarre, 1983). Organizational structures like matrix structures suit more those project activities. (Clark & Wheelwright, 1992) Studied the different project structures and decomposed them into 4 categories: functional team structure, lightweight project manager, heavyweight project manager and autonomous team structure, where players go outside their job structure during the time of the project.

According to the PMI (PMI, 2003), the organizational alternatives able to support a project oriented view of the organization can be decomposed into 3 major categories.

The first one is the functional organization. Every member of the staff is under the supervision of a functional manager. This is the group of functional managers that assumes the coordination of projects.

Because this is a repartition by functions (finance/marketing/engineering), the collaboration among staff members for a common project is difficult to obtain and the scope of the project is limited to the boundaries of the function. Every employee does not consider himself as part of a project group but still as part of a precise department. Project management is just a part-time job.

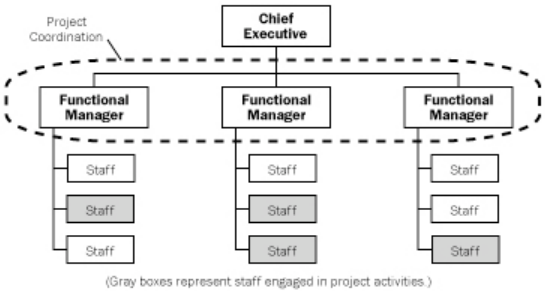

Illustration 2. Functional organization

Opposite is the projectized organization. In that kind of structure, the staff is considered as a subordinate of a full-time project manager. That means every employee is not characterized by the functional department he represents but by the project is working on. The cohesion is strong and coordination of team members easier because members are full-time involved in the project, and the project manager has an almost total authority.

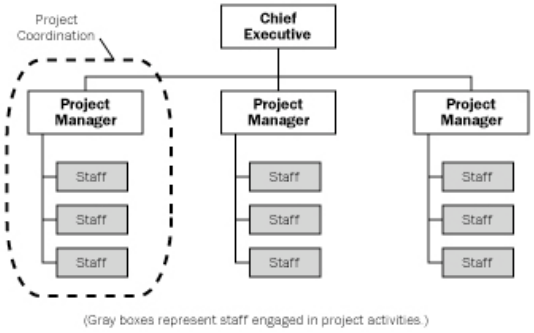

Illustration 3. Projectized organization

Between those two organizational alternatives, another one can be considered: the matrix organization. This is a balance between the functional organization and the projectized organization. This matrix organization alternative can be decomposed into three types of sub-organization.

First, the weak matrix organization considers one staff member as a project leader who coordinates members from other functional departments to realize a project. In that configuration, the functional manager still holds the budget. The major problem is functional managers don't usually understand the utility of the project and that can create sever disharmonies and inefficiency within the project team.

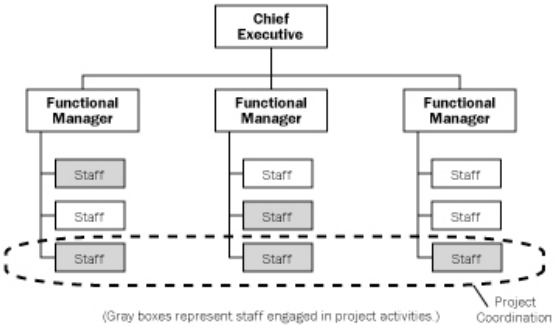

Illustration 4. Weak matrix organization

The balanced matrix organization set up the function of a full time project manager, who understands the project and has the authority to spend resources.

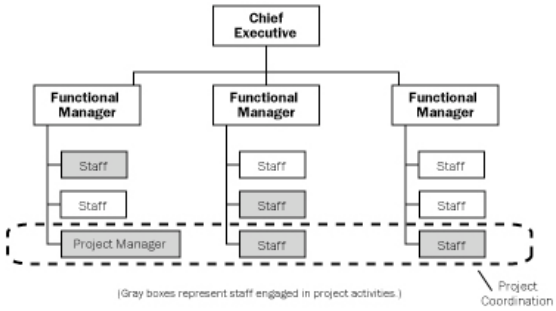

Illustration 5. Balanced matrix organization

Galbraith (Galbraith J. R., 1971)developed the concept of the "Pure Matrix Organization", also called strong matrix organization by the PMI. A full time project manager is part of a functional department fully allocated to project management, under the authority of a manager managing all the project managers. The team members are taken from the staff members of adequate functional departments and allocated temporarily to the project. Strong matrix organizations are characterized by a dual authority relationship. There is a power balance between the project manager and the functional manager.

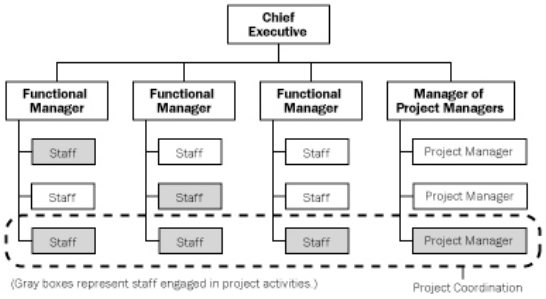

Illustration 6. Strong matrix organization

Several theorists tried to find the structure most adapted to a flexible environment requiring multi-skilled teams. One example is the non-bureaucratic structure (Heckscher & Donnellson, 1994).The circular organization (Ackoff R. F., 1989) seems to be the best way to support a company based on the concept of collaboration. Every person in a situation of authority is provided with a board composed at the minimum by his supervisor and subordinate. The circular organization is directed at increasing the "power-to" do something, not the "power-over" someone, limit the resistance to change. It gives employees a voice in making decisions that directly affect them, because of its codetermination-based decision-making process. The power is circulating as well as the leadership,

regarding the competences required at a time.

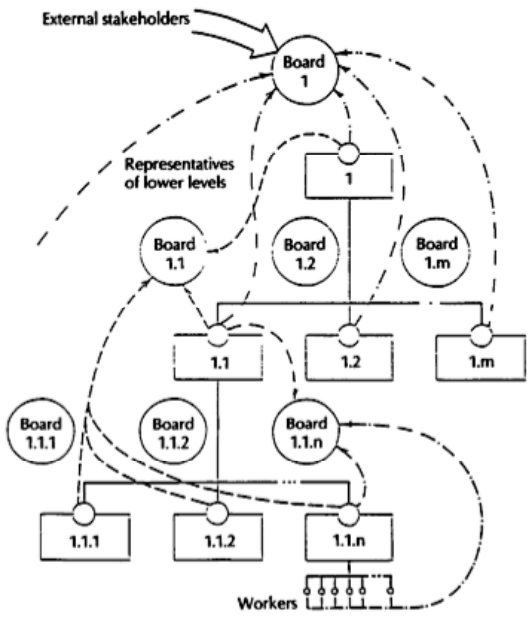

Illustration 7. Circular organization

Most modern organizations involve all these structures at various levels. For example, even a fundamentally functional organization may create a special project team to handle a critical project. Such a team may have many of the characteristics of a project team in a projectized organization. The team may include full-time staff from different functional departments, may develop its own set of operating procedures and may operate outside the standard, formalized reporting structure. This is the case of the composite organization.

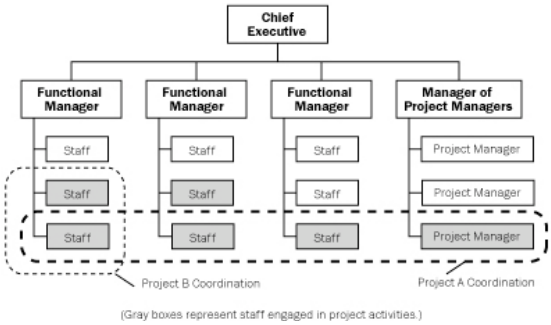

Illustration 8. Composite organization

More recently, the apparition of technologies allowing people to work together whatsoever the distance separating the co-workers made the matrix structure easily applicable because employees do not have to be physically present in the project team to be part of it. Collaboration between multiple building trades became easier using those virtual teams.

Eventually, to have a really efficient collaboration threw your structure, you must not take one of these models and apply it as is in your firm. Your solution must be a hybrid between the strong matrix and the circular organization, adapted to the specificities and the identity of your organization.

In a dynamic environment, organizations have no choice but to modify their way to work. The modification is coming increasingly and concerns all the positions

of the company: employees, managers, IT systems, structures, stakeholders.

Because innovation is the guideline to follow in turbulent environments, organizations need to collaborate within itself as well as with its enlarged sphere. To reach an effective collaboration, transversality must become a standard and must be thought regarding the information to share. Virtuality enhances this collaboration and drives the need for new organization structures.

Within globalization, virtuality and transversality become indissociable.

But the change is not possible overnight. The lessons learnt must be remembered and the progression must be constant. However, the top-management must not delay this mutation or the new organization will answer an already gone environment.

Perseverance and forward looking will make virtual teams tomorrow's reality.

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