

# Collaboration and Technologies: Which Organizational Practices?

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**Abstract:** While companies are more and more favorable to collaborative approaches between their services, reflections on learning to use technological tools rarely call into question new organizational models. In a field where many impressionistic approaches related to mere trends or finalized developments are to be found, technological tools may contribute to the development of the collaborative capacities of the firms and may also help to better apprehend organizational changes based on technologies. In this context, a comprehensive framework for the adoption of tools and for the functional integration of the company into its environment may be proposed, thanks to a series of interviews carried out with several international companies.

Keywords: learning, technological tools, organizational strategy, interpretative framework, collaboration.

## 1 Introduction

International companies are more and more aware of the strategic quality of immaterial assets. As a result, they adapt their management behaviour so as to avoid losing markets. As a matter of fact, in terms of collaboration, they regard information and communication technologies as a way to solve technical problems rather than as an organizational tool.

The organizational border between the workstation and the actors' experience now partakes in the adjustment of a "structure which transcends organizational learning" [RE05]. Beyond new organizational forms, exchanges between any company and its environment should be taken into account to understand the motivations leading to heavy investments in technological tools. Technological learning modifies certain characteristics of the organization and quite often accounts for the choice of the adopted tools [KE04]. Therefore, to avoid any confinement to preoccupations exclusively related to "the organizational imperative" which are only interested in determining whether technologies have any given effects on organisations [MA05], organizational changes based on technologies have to be put forward, notwithstanding the fact that flexibility, reactivity and open-mindedness do not always give rise to new organizational models.

These are so many questions which are in keeping with several theoretical contributions [2]. In an attempt to address them, a series of interviews had to be carried out with several international companies, following an inductive method [3]. Resulting from them, the interpretative framework for organizational changes [4] makes it possible for managerial results to be discussed and for future research tracks to be formulated [5].

## 2 Debates

What matters more with learning how to use technological tools is not so much organizational change as the satisfaction of new strategic issues. Indeed, debates on technological tools mostly encourage researches clearly related to the companies' expectations. They attempt to measure the impact of new technologies on the firm as well as to observe the emergence of new collaboration models through information exchanges and group work. Groupware, electronic document management, e-learning, e-mailing or the Intranet all proceed from choices initially motivated by operational needs which often lead to new strategic issues.

A first doctrinal trend considers the acceptability of the different tools in terms of learning. The worker's various situations of use during information exchanges or problem solving at work are analysed [DA99]. The tool's functionalities often come against technical issues, communication problems or relational obstacles. The disappointing results obtained by learning technologies urge us to acknowledge the diversity of ways in which users may integrate them [BA86].

A second doctrinal trend studies the diverse organizational combinations [MI85]. Informal communications make up for the lack of certainty of the environment by their impact on Information. The Internet, Intranet, databases, data exchange, administrative and commercial functions treatment, process automation and electronic document management are services which make it possible for abstract and complex situations to be dealt with. They require an important intellectual investment if any function is to be achieved. Using technological tools then makes it necessary for work organization to be renewed, calling into question the structure of companies. Human resources management also becomes an increasingly important issue for companies in terms of competitiveness.

Therefore, we may wonder if learning to use technological tools encourages new organisational practices and if these foster a diversity of collaborations. We may also wonder whether technological tools should be considered as organisational indicators or if it is the use of the various functionalities of the implemented tools that should be taken into account. As a matter of fact, learning is not simply linked to the technologies that can be found in the organization, it also facilitates access to information required for instant decision making. As techniques spread, change only determines in which direction organisations may evolve. Any organization may experience the use of counter-productive tools, a source of conflicts, malfunctioning or dissident behaviours. As a result, learning how to use technological tools is made decisive for the organization through collective action. Nothing else is required to check that objectives have been met [efficiency] because tools are a twofold construct [a deliberate construct which then has to be integrated]: their reality comes from a perception of the meaning of behaviours [RE05], and each organization can be said to have its own indicators of social performance if we take organizational patterns and strategic objectives into account. However, this is not sufficient to ensure the establishment of a strong organizational coherence. In these conditions, it is not surprising that technological tools should come in for harsh criticism because they cannot achieve efficiency single-handedly, as it is up to the organization to introduce appropriate learning methods. Hence, to adopt an inductive methodology of observation according to the limitations related to this reasoning [LE99] seems adequate with the study of the technologies' structure of use applied to organizational processes.

### **3 Methodology**

B. Glaser and A. Strauss' grounded theory [GL67] relies on an inductive approach aimed at understanding the relationship between corporate strategy and technological choice within an organizational context. Within this framework, a sample of 28 companies of different sizes and sectors is used. To fully ensure that the validity imperatives are respected, the companies have been selected according to their representativeness [TO67]. They operate in the sectors of insurance, banking, building, car-manufacturing, telecommunications and tourism. The diversity of the strategic groups' configurations is thus respected [TH88].

The analysis of the interviews begins with the coding phase which takes into account the units of analysis from which theoretical propositions may then come up. The collection ends when managers have answered all the possible situations. Indeed, content analysis implies that speech be divided into units of analysis then leading to categorization, so as to define a world of reference for speech [GL67]. A table can be used to present the illustrative analysis units in a first column [name of the company, interview transcription], with key-codes in a second one and axial coding and emerging research categories in a third column. It is then easy to compare the answers of each company on such and such a topic and to draw links between companies so as to isolate certain parameters. Each code has to be short and mnemonic and has to refer to an illustrative unit. Thus, "INT" refers to the [INTEG] category and to the INT-GLO subcategory [global integration].

Illustrative Units of Analysis	Key-codes	Axial Coding
<b>Integration - Implementation</b>	INT	
<p><b>An industrial company</b><sup>1</sup> : “We aimed at spreading the group’s spirit and our global customer vision among all the employees of the group, that is 70 000 persons. The implementation of an Intranet is a first for the group and technical bases on specific products appeared in the different job fields. The whole application was developed by an adviser specialised in engineering and multimedia production. Now we just have to convince the employees to use this new work tool.”</p>	INT - GLO	<p><b>Global integration of the organization.</b> Companies may endure flexible equipment through the use of technological tools. Actors collaborate internally by constituting an intellectual capital through the use of networks to mobilize competences to the best. Externally, they are inscribed into value chains so as to present a richer set of complementary offers.</p>
<p><b>A Hotel:</b> “The group develops internationally in countries representing a strong economic development factor. Given the complexity of markets, the creation of new jobs and the apparition of new technologies, the skills required for each collaborator are on the rise. As a result, our group needs to have a global view of the organisation”.</p>	INT - GLO	<p><b>Global Integration of the organization.</b> The extended Company translates into a large collaboration and better knowledge management. Companies are interested in improving their relations with their immediate partners by sharing knowledge more efficiently. The group then seeks to save time, reduce costs and increase its income.</p>

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<sup>1</sup> The different companies referred to are more specifically presented in C. Baujard, *Motifs d'adoption, processus d'intégration et modes d'apprentissage e-learning, proposition d'un modèle stratégique* (Reasons for adopting, integration process and e-learning training methods: a suggested strategic model for corporate training practices), Thèse Univ. Paris-Dauphine, 2004.

<p><b>An air Transport Company:</b> “The deployment of new computing equipment was the occasion for us to restructure the organization and put online training into place. The objective is to introduce technologies gradually, encourage the acquisition of reflexes towards new learning methods and to give access to the Inter/intranet culture to more and more people.”</p>	<p>INT - GLO</p>	<p><b>Global integration of the organization.</b></p> <p>It’s essential for any scheme to be based on a global approach. We first considered the individual factors linked to learning mechanisms, then technical factors related to mediatization were considered, as well as organisationnal factors related to the material conditions for the human support of the process and the cultural factors.</p>
<p><b>A company in the energy industry:</b> “The development of new technologies enabled that of online sales offices and the development of e-procurement then became part of the group’s Internet approach. The acquisition of knowledge and skills is also important. The relation between work organization, staff mobilization and the individual’s interests should be reflected upon, as a global vision of the company’s human resources.”</p>	<p>INT- NDS</p>	<p><b>Needs expressed.</b></p> <p>Some employees refuse to use the new technology offered to them because of former conflicts in which they have been involved or owing to the deployment of other tools made with no regard for the actual needs.</p>
<p><b>A transports company:</b> “To be an advantageous solution and an asset on the market, tool integration has to proceed from a strategic decision in the organization, as a tool for the recognition of each employee’s capital. Tools modify the working methods. Learning how to use tools is still frequently missing from the experimentations’ perimeter. As always with the introduction of ICT, the question of needed time comes up. “</p>	<p>INT- NDS</p>	<p><b>Needs expressed.</b></p> <p>The computing tool gradually becomes a learning tool and a pre-requisite for the experimentation of tools. The traditional conception of this tool as a tool for the adaptation of work organization in the company nowadays seems to be outdated.</p>

<p><b>A car-manufacturing company:</b> “The degree of social cohesion was previously established in the company. The current affairs of the company are then known to everybody as part of the daily discourse of the firm. This culture generates a substantial company dynamics in which everyone is aware of his/her role in the production of the final product. There is no doubt that to be part of the group provides the employees with a feeling of pride.”</p>	<p>INT-NEG</p>	<p><b>Integration Negotiation.</b></p> <p>In the car-manufacturing industry, the integration of the extended company is often imposed to subcontractors. It is the occasion to share know-how through the use of implemented means. Equipment manufacturers, subassemblies suppliers, speciality or capacity subcontractors often fail to identify it as a means to reduce their costs or to gain in added value.</p>
<p><b>Organizational Impact</b></p>	<p><b>IMP</b></p>	
<p><b>A cosmetology company:</b> “Everything must be done to avoid rejection, not only as regards to costs but also because failure has a devastating psychological effect on employees involved in the mutation of their company. The catastrophic lack of accompaniment of ERP should be avoided at all cost. In factories, e-learning is commanded by the manager. E-learning cannot achieve success without pedagogic intermediaries. Approaches which are too technological are often at the origin of the first failures. A strategy of change supported by logic of team project is the answer.”</p>	<p>IMP-COM</p>	<p><b>Job Competencies.</b></p> <p>Context depends on the organization’s ability to adapt to the technological and behavioural dimensions inherent to learning which are sometimes difficult to deploy in certain organizational contexts.</p>

<p><b>A bank:</b> “To meet the sector’s desire for strategy, we introduced new technologies into our job, which requires better trained employees. The results of this will show that the processes’ electronic treatment has a positive impact on efficacy. Likewise, the average cost of acts’ treatment using the electronic procedure is beneficial to efficiency while the average cost for acts’ treatment using the paper procedure is detrimental to efficiency.”</p>	<p>IMP-COM</p>	<p><b>Job Competencies.</b></p> <p>Decision sometimes corresponds to a rationalizing approach showing the conflicts related to the definition of necessary competencies. A number of contradictions should also be underlined, as some predict that ICT use will cause the firm’s size to increase, whereas empirical studies demonstrate very clearly that ICT use causes the firm’s size to decrease.</p>
<p><b>ICT company:</b> « Genres are blended and knowledge has to be brought as close as possible to the employees on the ground. Mobility is compulsory. Available positions are displayed online through job advertisements targeting the best possible person. This system is actually hardly used by collaborators as it depends on the individual who is in charge of the development of his/her career and who either chooses a job search or a job change approach. This leads to a strong coaching culture. It is an endless process which cannot be regarded as management or as mobilization but rather as a sharing of managing activities with a high degree of servuction in the management of competencies and an involving dimension. The human capital in which the employee is the actor of his own competency is not related to his professional experience but to his/her degree of expertise.”</p>	<p>IMP-COM</p>	<p><b>Job Competencies’ Modification</b></p> <p>Advanced practices are more often linked to the implemented working methods than to the tool itself. Users have learnt to work together but tools only serve as a help.</p>

<p><b>Telecommunications company:</b> “The organization policy aims at transforming the foreman into a real manager with a corresponding remit. The foreman used to behave more as a spokesman for the employees than as a real team manager. Nowadays, he may partially take charge of the employees’ work and he constitutes the founder and the main link in the chain of the new organization. He does not only supervise his teams but he also accompanies strategies at the local level to decentralize decision-making as much as possible, while keeping the own local culture of each unit under his responsibility. They identify themselves as interlocked entities in the new organization”.</p>	<p>IMP-PWR</p>	<p><b>Power relations</b></p> <p>Tools offer an escape from technological rigidities as they make it possible to define alternatives solutions to power which offer new forms of social coherence. However, the models stand in contradiction. An expert system reduces the cost for the acquisition of needed knowledge and the employee sees his/her competency domain enriched, and hierarchical control is facilitated. On the other hand, the employee may also more easily call his/her superior to solve a problem.</p>
<p><b>Cosmetic company:</b> “As we have to face the competition, our group is mainly concerned about keeping our indispensable knowledge bank. Several large groups covet our position. That’s why we struggle to keep it. Part of the group’s success comes from its internal growth. At the international level, multiple acquisitions accelerate this growth through the addition of new brands with a worldwide potential which are present on promising sectors not yet occupied by the group [...] On the other hand, the company’s increasing results also come from the constantly improving industrial productivity and the expertise of our system which benefit from the automation of certain processes.”</p>	<p>IMP-CON</p>	<p><b>Knowledge distribution</b></p> <p>In other cases, important efforts are deployed but the results are not always up to the expectations related the use of such technologies: users keep wondering how they could use these tools and do not go beyond an instrumental conception of the tools.</p>



<p><b>A consultancy company:</b> “In our competitive world, the working situations which the staffs have to face have changed dramatically. Employees do not have to carry out pre-codified tasks any longer. They now have to face a limitless range of demands. A previous form of certainty has given way to the uncertainties of external or internal events affecting the management methods.”</p>	<p>IMP - CON</p>	<p><b>Knowledge distribution</b></p> <p>The technical performance affects the learning cognitive frame. Companies stress the uncertainty of both the impact on the configuration of work and the staff’s experience.</p> <p>They dread the huge diversity of uses.</p>
<p><b>An IT firm:</b> “Considering our position we must be innovating all the time and manage our grey matter potential as best we can. Therefore, we have emphasized a consistent policy aimed at measuring the migration effort of knowledge towards new technologies, at initiating a process revolving around the skills management of the IT department in keeping with the target technological infrastructure and at meeting the needs to retain skilled workers and at attracting new collaborators. This was achieved through a genuine skills management policy organized in several steps. The objective was first and foremost to create a common system of reference to draw up a jobs specification.”</p>	<p>IMP - CON</p>	<p><b>Knowledge distribution</b></p> <p>The implementation of the (technological) tools leads companies to make their tools evolve and to select new ones while taking into account the structural barriers which are sometimes linked to technical compatibility problems. In such conditions, it is not surprising that technological tools should be criticized as they can bring efficiency to a company provided it can launch the necessary training courses.</p>
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Table 1: Series of example of data analysis.

Open coding starts with data analysis which becomes clearer as the experience of companies becomes more obvious. Once the analysis units have been located they are categorized according to their similarities, they are then classified and grouped gradually around a code list. The axial encoding is for spotting the contextual elements regularities in order to emphasize explicative interactions. Finally, selective coding analyses the connections between the different categories and the contextual elements while looking for a balance between the organization flexibility and competitive assets. The interaction between two types of analysis units, “technological tools integration” and “impact on the company”, gives us the opportunity to identify the emergence of new collaboration modes. The study of the activities enables us, therefore, to stand out from other approaches based on the mere use of technological tools within the organization of work.

#### **4 Interpretation framework of three types of company practices**

The analysis of emerging concepts can be used as a framework to interpret organizational changes. It shows internal evolutions linked to flexibility and encouraged by the integration of technological tools. It also shows more contingent evolutions resulting from the competitive assets of international firms. Three types of organizational changes can then be pointed out. The first type of organizational change clearly corresponds to companies whose learning process depends mainly on the external and internal context. The organization of their information system – based on the development of human resources – encourages coordination between external and internal information. The tools follow the organization transformations by providing collective representations which alter both the basic technical knowledge and the job competencies. These companies are under several obligations due to their geographical scattering. It is thus essential for them to master some key know-how and skills in order to get the upper hand over their competitors since they hope to make the most of their connections to increase their intellectual capital and share it with their employees. These companies interacting with their executives, their employees, their partners, their suppliers and customers lead to irregular external and internal coordination cost reductions. The skills rely on the capitalization of experience feedback based on signs from the work environment. They favour decentralized learning methods and highly flexible tools whose profitability is guaranteed by their direct partners. The technological investment turns out to be beneficial in highly competitive sectors which generally have the best IT equipment and the best technical systems.

The second type of organizational change appears in companies whose process of learning how to use technological tools generates a knowledge acquisition which is hardly imitated and which has no direct market. This knowledge is stocked for other purposes. These international companies have quickly realized the necessity to value this knowledge despite the barriers when developing the tools in some organizational contexts. They are the least computerized and build their own learning methods using the collective representations as well as a great deal of advice from the education world. Technological tools disrupt internal relationships and they can affect the balance between the effort put in and the effort in terms of technological tools corresponding to the local requirements. The collaboration between the people involved can be achieved through the diffusion of the easily accessible intellectual capital in the workplace which then becomes a knowledge and expertise medium for employees. It can also help managers build up a network of new skills

Finally, the third type of change entails a limited choice of learning capacities. The companies involved have difficulties finding their bearings in a newly enlarged environment which requires some unrealistic common effort considering their technological potential. The employees are not always willing to share information and they are sometimes reluctant when it comes to the reorganization and the necessity to learn quickly. In this case, a discrepancy between the technological tools and the different users' needs can be pointed out. Thus the tools are avoided and end up becoming a constraint rather than a work support. This is all the more frequent when the employees realize that the multiplication of tools results in additional paperwork and more time devoted to information management. Some employees won't even use the new technologies at their disposal due to past conflicts in which they were involved, or due to the introduction of other tools ignoring their genuine needs. It is crucial therefore, to strike a balance between general coherence and tool flexibility.

## **5 Results analysis**

This interpretative framework cannot reflect all the situations related to organizational practices. Even though several types of training approaches may be pointed at, the gap between the initial expectations and the actual deployment is always linked to the mixed results of the strategic decisions made about the corporate environment. Change depends on the management practices achieved during the development of technological tools or on its gradual enrichment within the company. The process of becoming familiar with technological tools triggers more questions than answers. Organizations use their knowledge in different ways. Few are those who do not regard their human capital as a key to success. If the learning process requires the integration of the technical, human and cognitive resources within a comprehensive strategy, change becomes an entry point which makes it necessary to make some constant adjustments so as to achieve a consistent practice of the organization.

Thus some companies which do not invest much in a tool sometimes achieve a level of use which is utterly satisfactory and has nothing to do with the level of investment. Conversely, some technological equipment can have a poor return. The tools are often piled up rather than integrated in a well-thought-out and controlled way. The use of technologies is not always in keeping with the tools' initial functionalities. Some people, for instance, use these tools to a minimum or refuse to use them which can cause the system to lack flexibility. In other companies however, new technologies are used moderately, as it is the case in the companies which have involved their employees in the reflection about the evolution of their job. The latter build up new rules regarding the management, the transmission and the sharing of information. These new rules will be adopted when the tools have reached their operational phase. This flexibility is an asset which is becoming more and more significant to business partners [NA82].

The limits of this study are methodological. A longitudinal approach would have highlighted the managerial characteristics necessary to companies. Technology is perceived as both a resource and a constraint by employees. However, only a change in the training scheme can affect the relationships between the company and its environment. The collaboration potential questions the borders of the company. Management techniques offer a better understanding of the integration of the company in its environment. Yet our interpretative framework is based on an encouraging proposition while impressionistic approaches are not scarce. The companies surveyed admit that a company management policy depends on the integration flexibility as well as on the impact of technology on a company, in keeping with the international strategy. A lot of persisting difficulties stem from a lack of comprehensive outlook. In this respect we can wonder whether the process of learning how to use new technologies can lead to new organizational configurations or whether, on the contrary, the tools encourage the collective use of new technologies. This uncertainty is a criticism of the collective action on the very conditions which make this uncertainty possible and the limits it sets [CR77]. Finally, technological learning is closely linked to the organizational context and is highly dependent upon the experience of the people involved.

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