Transforming Organisational Culture through the Impact of Information Integration

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Abstract

Over the last 2-3 decades, investments in the new information technology (NIT) have left a deep impression on the life of organisations, that goes beyond ample differences in each organisation's degree of automatisation. Furthermore, although the generalisation of NIT investment has not produced, on short and medium term, the expected effects on financial and organisational performance, its trend has remained on the increase, and the preoccupation with the development and the implementation of new technologies remains associated with the "ice-breaker" imagine in almost any field. Research has demonstrated that although technology is one of the most important factors that influence productivity and that, although at least in theory, all countries have equal access to technological innovation, in fact, productivity is influenced by many other factors (acquiring physical and human capital, infrastructure, the structure of the market, demographic evolutions, the degree of competition etc).

Keywords: organizational, culture, integration, productivity

1. Introduction

The mass-media present information technologies as simple instruments, even when they represent complex combinations of various equipment, rules-roles-resources, and real-life and organisational practices, as it is the case with informational integration packages. In fact, they should be seen as technical and social systems , complex, interdependent systems that comprise:
• humans who interact with various information platforms, perform roles, engage in professional relations and carry out their activity according to the company's idiosyncratic organisational culture;
• equipment (computers, computer networks, input and output devices);
• software platforms (basic applications, network platforms, portal applications, business management packages, customer relation packages, e-commerce and e-business platforms, etc.);
• modern management patterns – the rapid changes in technology have had a special impact on business management. Managers know the customers' expectations, they research what the ambitions of the company's personnel are, and they facilitate the set-up of new organisational structures, that can develop responsibility and initiative and broaden one's individual range of competences;
• support resources – the so-called learning organisations must adjust their management style to numberless structural transformations due to their evolution towards a form of horizontal coalition or cross-sectional organisational structure. Organisational learning is developed "in and through" informational exchanges between the company's employees, irrespective of their hierarchical level or the position that they have;
• informational structures – content, rules and norms, information integration and integrity, access control and the security of the information system;
• continuous innovation – technology offers support to the employees to bring their creativity to fruition; it offers possibilities to select and interpret the current explosive data load; and it allows the creation of professional and business informational networks. Informational integration lends coherence to the analyses, ensures a real support for the decision-making process, and supports success in the context of business globalisation.

The previous enumeration makes one think of a "socio-technical model", that should be capable to generate at least the expected performance once the company invests in NIT. In fact, these elements are not configured in an "ideally projected way"; they are always interconnected in a matrix of social and technical interdependence, and the general effects are often unpredictable.

The real problem does not refer to how much IT have affected the organizations, but to the way in which the organizations learn to absorb these technologies and to use them most efficiently. Computers have gradually penetrated companies by adapting themselves to the existent organizational structures, more like tools used to increase the speed at which the activities within the business processes were performed. But, along with introducing them into organizations came the necessity of redesigning certain components in order to benefit of technological advantages and to grow the capacity of business processes integration.

The paradox of computers productivity was better observed in the early phases of the informational revolution. Paul David, professor of economic history at Stanford University, claims that a similar

effect was experienced at the beginning of the 20'th century, with the change of the steam engine with the electric engine: decrease of productivity, followed by the development of new plans. David thinks that this transitional phase finally ended in 1920. As for the present productivity paradox, the author's opinion is that the problem has been solved in the early 90's, when the computer ceased to be considered a simple work mechanization and data processing tool, and people began to see it more like an instrument used for acquisition and distribution of information across communication networks.

At the same time, we are witnessing a leveling of organizational structures and the transfer of responsibilities. IT Departments are now considered to be service providers, rather then just cost.

2. The relationship between organisational culture and information technologies

The definition of causality relations between the organisational culture and technology, on the one hand, and the impact of the latter on performance, on the other hand, as well as how practice tests and assesses these definitions and performance parameters, are still a matter of disputes and speculations.

Technology is more permissive when observations and measurements have to be done, from the point of view of the value of investment; it causes similar disputes and speculations in the broader context of the impact on productivity, on organisational performance and on "good practice" in an organisation. Empirical studies on the results generated by the implementation of the Lotus Notes system [17], [20], the success and failure of electronic publications that use identical technological systems integrated in different social and technical systems [17] or evaluations of NIT management in the public sector [12], are only a few examples that highlight the difficulty of precisely evaluating and modelling the factors that measure the efficiency of NIT investment.

[22] define technological infrastructure as comprising information equipment and technology. It serves technical interests, by applying scientific rationality. Human infrastructure is defined by cultural elements, i.e. by languages, habits (or routine), common practices and modes of social organisation.

One can easily notice that technological infrastructure implies a type of rationality that is different from the rationality of human languages and, therefore, no matter how perfected it might be, it cannot directly improve our communication practices [5]. Significations, hence messages, are created by humans and not by machines. The latter can only create communication opportunities, not necessarily better communication; opportunities to increase performance and not necessarily increased

performance. Solow's paradox, already mentioned in the introduction, confirms this by referencing data from US statistics.

Furthermore, if technology is relatively reliable and predictable, people are essentially changing, unpredictable, capable of non-programmed reactions, and their communication, whether mediated by artificial means or not, preserves its "self-generating", "self-specific" character, according to the unique interaction pattern among participants.

If we go back to the opportunities offered by investment in NIT and to the evolution of the cultural characteristics of various groups (from nations to organisations, or even to the gang in the street), we can notice a more marked "cultural contamination", a heightened uniformisation of values, beliefs, preferences and behaviors.

However, at the same time, the instability of these cultural characteristics is also on the increase. After a while, culture seems to have more in common with fashion than with sustainable tradition. Its instability grows as values are emulated from the TV screen or the computer screen rather than from flesh and blood models. It is much easier and much riskier to betray the TV set or the computer, than to betray your parents, friends or mentors.

The "threats" induced by NIT, i.e. the reverse side of the coin in human development, include depersonalisation (via standardisation and non-involvement), the diminishing of the capacity to directly relate, the degeneration of senses, the increase of aggressiveness (it is already known that, psychologically, one can easier kill by pressing a key, without seeing the victim, than when the victim is in front of the killer), informational bulimia, lies (most believable lies are told on the phone and over the Internet), and withdrawal into anonymity.

A selection of definitions given to culture and to the elements that make it up would make us go beyond the scope of the current article. We will only mention the focus areas for the discovery of culture, suggested by [14]:

• mental states area, which reflects cultural differences via differences in the manipulation of the sensorial register (some of us are more sensitive to colour, others to sound, others to smell, etc; some people are killed by cold, others are barely challenged by it);

• daily behaviour area: daily habits, rituals, small gestures, are the first indices used by cultural "characterization";

• the so-called "savoir-faire" area: the quality and philosophy of trades and jobs, the capacity to assimilate new technologies, the concern for the well-made job (or its lack), how one communicates with the others, already delineate the first cultural contours;

• "product" area, as ensuing from the previous area: the architecture of the house, the layout of the street, the car line, the statues in the marketplace, the garden, they can all delineate cultural "borders";

• institutions and collective organisation modes area: the structure of public and private institutions, the quality of the humans who operate in this area, the answers that one can receive in this area, the smell that meets someone at the entrance, all this can clearly indicate the particular location where one stands.

The NIT evolution has gone far beyond all forecasts from the previous century. It has gone so far beyond them that it influences our sensorial preferences (how many hours do we spend in front of the computer?), it modifies daily behaviour (what is the relationship between the number of greetings by holding somebody's hand and the number of on-screen greetings?), it transforms the assimilation of new technologies into an almost permanent challenge. The "product" and "collective organisation modes" can hardly be dissociated from the models created in the NIT area.

Despite this, the cause-effect relationship between the organisational culture and NIT remains questionable. [19] lists a few of the possible causes of failure in the change of organisational culture:

• organisations replicate the family structure and the behavioural practices of the culture in which they are integrated.

• "the narcissism" of the internal group, the division between "we" and "them," going to "we against them" are constant features of human beings (and of other animals).

• organisations are, by definition, living organisms. Consequently, they have developmental stages and they evolve according to adjustment patterns that have to do with various complexity levels.

• all living organisms go through a continuous process of change, both inside and within the environment where they operate.

• all groups follow a leader. Different groups, at different moments, need various management styles, but the policies, practices and organisational structure of the founding leader are often the most durable.

The change of organisational culture, in parallel with the introduction of NIT, is confronted with the same obstacles. Whether change brings about success or failure depends on the harmonisation of technological and social considerations.

3. NIT – the catalyst of organisational changes
In the 21st century, organisational learning and the essential modification of the relationship between human beings and work are tightly connected with the advantages of the adoption of the new information technologies:

• NIT favours social development by improving the feeling of personal value, teams are structured according to multidisciplinary competences (rather than hierarchically), and the network enterprise becomes real;

• NIT facilitates collective learning, improves group and individual performance and expertise, stimulate reactivity and innovation, participates to the formation of the learning organisation;

• NIT improves the company's organisation by cross-sectional processes generated by the communication-coordination-cooperation relationship: customer quality, company's performance and competitiveness.

We live in a knowledge-based economy. People and their knowledge make the difference in the competitiveness race. The value of today's products and services is given by the quantity of information that they contain and by how appropriate the decisions made on the basis of this information are. The relevant information is: information on the customers' current needs and aspirations, information on the market and the macroeconomic environment, information on competitiveness, information on the new technologies and evolutions in other industries, information on the effectiveness and efficiency of domestic activities, etc. If this information is efficiently assembled in products and services, it generates added value and hence, competitive advantage. Since organisational culture represents shared beliefs, values and significations, it then has a significant informational component and it benefits from the support of information technologies. The globalisation context constantly enhances the relevance of this technological support.

NIT facilitates information sharing and it optimizes information or knowledge flows. Thanks to them, certain types of management based on collective knowledge and intelligence have emerged (business excellence, the management by objectives system, total quality management, reengineering etc.). The evolution was made possible by:

• The organisations' informational integration and integrated management technologies: groupware platforms, portal-like application ;

• The emergence of a new set of concepts: capitalisation, management and strategic knowledge management, collective intelligence, the learning enterprise, knowledge management;

• The development of specific devices: knowledge resource centre, competence networks, project management, process management etc.

Although NIT supports the alignment of enterprises and customers that are geographically dispersed, it also creates problems that organisations which aim to move on to "virtual economy" must solve. We have the example of electronic trade and business through which firms can reach any other company or client in the world, after previously solving problems connected to the design of a Website and the integration of the security systems through which electronic payment and information sharing are done.

4. Reconfigured organisations

Within the new social and economic context characterised by mobility and interdependence, an enterprise that wishes to become competitive must rethink its organisation, mobilise its human competences and redefine its strategies. The three units of place, time and action are replaced, within network organisations, by processes that cross all structures, desynchronise activities, and dematerialise exchanges, thus offering more autonomy to the organisational players.

The characteristic features and the operation terms of a network organisation can be summarised in two main ideas:

• The organisation is defined according to the organisation's final goals, its projects and according to the structures that it has. If it is shared among players, the final goal of the organisation becomes an integrating factor that is even stronger than its operational capacity. The individual's loyalty to the network organisation is done by sharing the project and the community of interests;

• The process of piloting the organisation abandons old formalisms so as to bring together two structuring factors: the project, which is the operational and player-convergence engine, and the methodologies that ensure operational coherence. Consequently, knowledge and intelligence are no longer centralised but distributed throughout the organisation. Furthermore, the fluidity of information and knowledge exchanges increases and thus a common language and a common culture are created.

"The engine" of the classical organisation based on the articulation of means will be replaced by the one based on competences and knowledge. The capitalisation of knowledge has all the characteristics of a process of transformation of information, knowledge and ideas into experience, rules and methodologies. The outcome is a gain for the models of future action.

Contrary to the principles traditionally agreed upon by industrial organisations, in the case of a knowledge-based organisation, the needs, the methods and the work instruments cannot be defined beforehand. The organisation must be capable of producing knowledge and of constantly mobilising its intelligence, so as to competitively respond to the new and unpredictable problems that may occur. These objectives can only be reached via the process of organisational learning.

Within the organisation, the work environment and, implicitly, the organisational culture, will undergo significant transformations. Technology offers employees the support to bring their creativity to fruition, the possibility to hierarchically rank the informational load and to create both personal and business networks. It is important that employees should understand the benefits of the new system and should welcome change with professionalism.

Change management is an important part of NIT implementation projects.

In the case of NIT projects, the organisation by project teams eclipses the classical organisational modes (according to value channels). The main difficulty, in this case, consists in establishing teams. Managers revise their style; they establish a balance between ensuring the best operation and the autonomy of work groups. Flexibility becomes an imperative objective within the enterprises that must face fluctuating demand. The new way of thinking, focused on "knowledge portfolio" begins by flattening hierarchical levels. The individual is positioned within the organisation according to the qualification and knowledge that he or she has. He or she can then, progressively evolve, becoming ultimately a project manager. Managers know what the customers expect; they research the ambitions of the company's staff and facilitate the design of new organisational structures, which can develop responsibility and initiative and broaden the individual range of competences.

If an organisation expects the implementation of an integrated product to reduce the uncertainty associated with economic processes, the opposite is equally likely to occur: the increase of uncertainty. Under the circumstances, the compatibility of the application package with the company's own experts must be perfect. Thus, to update one's professional knowledge becomes a habit.

5. Conclusions

The empirical studies mentioned in the beginning specify two organisational factors that are essential to the success of the effective use of NIT: the human beliefs and mental patterns on technology and on their own work, as well as organisational characteristics concerning internal policies and rules, information treatment practices, employee and collaborator rewarding system. At least in the NIT implementation stage, the two factors can tilt the scales towards either success or failure. The change of culture under the influence of NIT takes place when the organisation's employees can experience the benefits of NIT, first of all outside the constraints of the rewarding system, when they have the occasion to freely express their opinions on the new approaches, when they have a time span available for adjustment and personalised integration of the new beliefs and values, and a period of time to reconfigure mental patterns. Most times, this period is compressed or dilated according to the differences and the inertia induced by the local culture (nation, region, family etc), according to the development stage at which each individual is, depending on his or her previous NIT experience. Someone who, on the occasion of the latest IT update, has acquired a few advantages in the organisation, will probably be less receptive than someone else who has lost a part of his or her privileges on the occasion of a similar change.

Under the circumstances, the force of the example, of the model, becomes extremely relevant. A relatively reliable way to change organisational culture supposes the use of prototypes or of pilot groups. When a representative group from the organisation takes the first step and their success becomes famous, the phenomenon of cultural modelling starts naturally. Trainings, the adoption of internal policies and rules, the alignment of the rewarding system, will support the added value of the new mental patterns induced under the influence of NIT.

The technological assimilation process resembles more the harmonisation of an orchestra to perform a concert rather than the individual study of a particular instrument. Individual virtuosity is a prerequisite, but on their own, an instrument and one musician only cannot replace the orchestra, the conductor, rehearsals, and the continuous adjustments that are commonly agreed upon.

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