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THEORETICAL CLASSIFICATION OF TECHNOLOGICAL FRAMES: A DIAGNOSTIC TOOL TO INCORPORATE INFORMATION TECHNOLOGY INTO ORGANIZATIONS

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ABSTRACT

Social construction of technological artifacts has been put forward by science sociologists, as an alternative to understand how technology has been created and developed all along the human activities. Particularly, in the last decades, and given the exponential technology breakthroughs and the repercussion on business processes, it has been critical to understand how this technology has generated a differentiating factor to positioning a company in a market segment or in a particular context. In this sense, several researches [KING, W.R. and T.S.H. TEO 1994, LEDERER, A.L. and V. SETHI 1992, LEDERER, A.L. and MENDELOW 1988] have been addressed to review the possible ways to identify technology the influence and impact on contemporary businesses, many of them based on psychological, causal and systematic effects, all of them offering fundamental findings. To date, however, there are few technology studies reviewing the individual relations context as a critical factor for technology understanding. For such a reason, this paper –supported by the foundation of systemic and cybernetic theories- [FLOOD 1999, FLOOD y CARSON 1993, BEER 1994, ESPEJO et al 1996, REYES 1995, MATEUS 1996], makes an structural analysis about relations among individuals, technology, and organization, reviewing those implications of technological understanding, putting forward a technological frame classification establishing a practical knowledge base for both practitioners and academics about the analysis of individual relations and its way to understanding technology, looking for new alternatives to be integrated into business strategies supported by information technology, and technological understanding impact of organizational players.

INTRODUCTION

Information technology has turned, in last years, into the development drive of rising organizations, as well as operational or strategic support of long-standing business ones. Through technology, organizations discover its integration and skill-generate abilities allowing them to compete in an interconnected world, where customers become increasingly important in generating value added, for their needs want. [PRAHALAD,C. and RAMASHWAMY, V. 2000]. In this line, information technology has turned into a key element to set the strategic bases of those companies wanting to reach an outstanding position around their business scope. [MATA, F. FUERST, W. And BARNEY, J. 1995, BENJAMIN, R., ROCKART, J. SCOTT MORTON, M. And WYMAN, J. 1984, EDWARDS, C., WARD, J. and BITHEWAY, A. 1995].

Therefore, technology incorporation processes in organizations arise as critical components for generating business strategies supported by information technology [JAVENPAA and IVES 1991], leading us to review its implications on the business communities last-keepers: The individuals.

Now then, should we accept technology as social process of reality construction through the participants relations, as an answer to a structural condition modifying its way of doing things, so as to evolve and reconstruct its interpretation of how the things should be done [CANO 2000b], so, understanding technology as a generating factor of competitive advantage, invites us to identify and know the individual understanding in the light of people expectations, assumptions and knowledge, about purpose, context, importance, and technology role, as a complementary factor to business strategies supported by technology.

In this line, researches on social area have been addressed [PINCH, T and BIJKER, W. 1987, HUGHES, T. 1987] revealing the importance of how implications of human actions promote creation of technical artifacts, the expression of social creation within the context of its historic development. In this way and supported on social reflections about technology, Bijker [1987] introduces the technological frame concept incorporating those concepts and techniques used by a community to solve its problems, whereby interaction of several different social players is defined around an artifact, seeking to reach a shared meaning around the posed problematic. Such a concept, was then taken and reviewed by Orlikowski and Gash [1994] in order to identify the already existent organizational frame subset regarding to knowledge, expectations and assumptions, the organization members use

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to understand technology, a concept offering a fundamental base to understand how technology arises as a social structuring process that in a complementary way describes or draw up a set rules and resources facilitating or constraining human action, and then contributing to the initial social context transformation and creation.

Although technological frame concept, offers an interesting analysis and theoretical structuring context as a means to claim and explain the reality of information technology in individuals, a classification thereof is not noticed addressing both, researchers and practitioners, so to determine the understanding impact of those people of information technology on the business processes.

In this paper, a theoretical classification of technological frames is showed, developed in reviewing of computer-system evolution throughout the course of history, seeking to establish individual, organizational, and technological elements as a support for researchers and practitioners to identify relevant patterns in information technology incorporation within the organizations. Such identification is framed and rooted within systemic thought ideas [FLOOD 1999, FLOOD and CARSON 1993, BEER 1994, ESPEJO 1989, 1994, REYES 1995], allowing us to notice the business community reality as an individual, organization and technology interrelation, as a social system looking for a purpose: to remain alive in the long term.

Arguments supporting classification proposal are summarized bellow, initially start reviewing those researches performed on technological frames and its relevance in technological incorporation processes, and then integrated to systemic thought components in information technology as a way of relating and reviewing individual, organizational, and technological implications implying a technological phenomenon understanding in organizations, in order to eventually establish theoretical classification of technological frames analyzing its scopes and limitations of researches on information technology.

BASE RESEARCH ABOUT TECHNOLOGICAL FRAMES

Paraphrasing Morgan [1996, page 1119] when referring to organizational culture, facing with technology means to discover the worldly as well as the more alive aspects of reality construction process. Under his influence, both organizations and individuals become investment centers because of the expenses and earnings they originate, and in the mean time, a creativity source as requirements recreating the organization reality.

From the above, a possible paradox is figured out, where technological phenomenon itself, is not independent from those people who notice or use it. That is, in understanding technology as a technical possibility that gets a social reality to operate, -result of a human acknowledge in the same social context- we understand such technology is not subordinated or constrained to an acceptance process or technical element use, but rather integrates the tangible technical possibilities as a means to construct the social systems.

Many of social perception discussions are not focused on technology *per se*, and instead emphasize in strategy, innovation, or the change management. Orlikowski and Gash [1994] think it will be beneficial, at least from the analytical viewpoint, to address interpretations about technology and its role within the organization. The term "*Technological Frames*" is used to identify the existing organizational frame subset related to knowledge, expectations and assumptions the organization members use to understand technology. This includes both technology nature and role itself, as well as the specific conditions, applications and consequences of technology in specific contexts.

A small researcher group puts forward the idea that individuals have assumptions and expectations about technology [BOSTROM, R.P. and HEINEN, J.S. 1997, GINZBERG, M. J. 1981, GOODMAN, P., GRIFFITH, T.L. and FENNER, B. 1990]. Gash and Orlikowski took back and expanded such ideas, emphasizing on social nature of technological frames, its specific content and its implications for development, implementation, and use of technology.

Technological frame concept lies in cognitive social research. Orlikowski and Gash [1994] make available a scheme on sociologic literature to study both technology collective perceptions and social constructions [BIJKER, W., HUGHES, T. and PINCH, T. 1987, HENDERSON, K. 1991, S´TNAN A. R. 1991]. In this literature, technological frames are the understanding the social group members have about a technological construction specifically, this covering both knowledge of particular technology and the local comprehension about the specific use in a given situation. This contextual dimension on frames is one of the ideas the authors want to preserve in dealing with technological frames, specially the latter meaning.

Technological frames have a powerful effect on people expectations, assumptions and knowledge about the technology purpose, context, importance and role, since as early mentioned, technology is a social construction, integrating itself to the way individuals make things in order to construct objectives, interests, and at the same time, it sets conscious or unconscious assumptions assumed by organizational roles, directly affecting organization and consequently, each one of individuals about its information technology interpretation.

The Orlikowski and Gash proposal, analyze shared concepts about technology, as an interesting means to articulate and maintain follow-up of information technology influence in organizations. Taken this into account, it is possible to establish some elements allowing us to recognize a cognitive inertia, constraining an organization adaptive process to changes on the environment business where performed, based on the three dominions identified by authors for technological frames: Technology nature, technology strategy, and technology usage.

Researchers consider above three domains are relatively general and can be applied to several different situations, whereby it is possible to learn about information technology in organizational context, as well as from other technologies.

Individuals as technology generators called to interpret technology in a social context. An interindividual relationships allow to review and improve the way of doing things. Such a situation gained from an indication inside the social community defines technological phenomenon as a property emerging from mutual relations. In particular, this interpretation establishes technology as a community property based on the several different relations constructed, rather than the specific usage of technological artifacts introduced by the organization.

Likewise, as suggested by Orlikowski [1992], technology defines influence of individuals social role within organization, leading to practices and actions senseless outside relations of organization players. In addition, it is important to notice that information technology as a social product suggests not a unique and static pattern, but it is a self-creating property and evolves in function to relations defined by individuals in a community.

In such context, information technology, sets and assigns variation models, as well as ref. points about organization expressions, thus integrating the environment thereof, trying to modifying its way of doing things in respect of its needs and defined relations between individuals.

The foregoing allow us to question ourselves, that technology incorporation into organizations is not only in function of physical technologic expressions, (hardware, software) but this is also an internal search about comprehension of the way of doing social things, allowing organization to understand and learn on its identity, as an opportunity to review itself and its relation to the world.

However, available literature fails to offer a way whereby technological comprehension in organizations can be identified and classified, as a support to integrate social and technical concepts into information technology strategies, since technological frames [ORLIKOWSKI 1992, ORLIKOWSKI and GASH 1994] make references to a particular theoretical relations established in each organization responding to an internal and proper dynamics of organizational identity.

On the other hand, proposing a classification scheme in this sense, given the particular context from each organization relations, requires to develop and interrelate a whole view, allowing to establish structure of social construction involving individual relations with its link to technology, as a systemic way to establish a classification strategy. Strategy used in this paper, has constructed a systemic interrelation among organization, individuals, and technology, three unique and complementary elements, which as stated by Saez Vaca [1997] when aligned and converged towards business processes, they reach a biologic state, that is, of alive and evolutionary condition, discovering the organization identity to reach a purpose.

If the above is right, a theoretical classification of possible technological frames, establishes a knowledge base to be used as an analysis element allowing to learn from organization identity, looking for understanding within the corporation reality context, how technology gives sense to organization activities.

SYSTEMIC CONCEPTS ON INFORMATION TECHNOLOGY

According to Ackoff [1999, page 96] systems approach focuses on identification of the whole and its relations, rather than its parts, thus allowing to see systems properties that only can be perceived by reviewing the same from a holistic perspective.

Therefore, any system is an element group dynamically time-related according to a coherent pattern, so as to reach a purpose [BEER 1994, Page 7]. The problem about definition is where said purpose comes from? In order to answer this question, it is necessary to use system elements. Consider an organization as a closed system of recurrent conversations between individuals, allowing to reach agreements to action. [FLORES 1996]. Based on this definition, individuals are those who recognize and discover the organization purpose, since they are the first ones who enter into contact with the system and discover it. That is, community facts are within the eyes of each one of its members. [BEER 1994, page 9].

If above statement is right, individuals interrelations, create and develop the organization, by defining meanings thus giving sense to business community. Therefore, organization is constructed through different players interaction and relations by creating a meaning structure generating the necessary cohesion for recognizing organization identity.

Likewise, and consistent with the statements above, technology respond to a social construction of individuals, in understanding its environment and conceiving new ways of giving sense to the way of doing things. According to the above, systemic considerations around the technological phenomenon draw attention over the inherent recursion to technology understanding.

Beer [1994] integrates and develops the recursion concept in Viable-System Model (VSM) which allows observing and diagnosing structural problems of relations among different elements making up the system. That is, reviews within the context those communication and control problems within the elements seeking to establish and manage the inherent range of each of the relations and elements making up the system, in order to reach long-standing elements. Although VSM, makes no reference to technology in the model, it indeed let to notice and relate the construction of a technological action domain described by the fundamental purpose of organization, that is, to survive at long term. Likewise, it helps us to focus in that "what is" organization, in order to focalize the individual technological construction reviews and the impact on system viability.

Such recursion implies that even though an individual develops skills or relations to technology, i.e. recognizes and understands technology as a possibility to give meaning to the way of doing things, it implies that there was a previous recognition and construction process of its technological comprehension, that constrains or makes possible its current reality. That is, a previous technological comprehension process is established that in a recursive way, it builds a way to see technology through the individuals experience. [CANO 2000 b]. This suggests, that technology as a social construction process results as an organization emerging property, gained from individual and collective relations to understand the complexity inherent to technological artifacts understanding within organizations.

As heretofore seen, both, organizations and technology converge towards only one objective: The individual. This perspective clearly allows us to notice conceptual interrelation the individual keeps with its environment and technology. That is, individual as a creator of technology conditions and relations, and technology as a structure result of individual relations within the context of organizational way of doing things. Therefore, the latter suggests that talking about information technology incorporation within organization, necessarily requires to talk about individual understanding as a prerequisite to find out technology organizational understanding, and this is reason to use technological frame concept.

According to statements above, in lacking of guidelines or studies addressing practitioners or researchers to channel differentiating strategies with technology to clarify the impact of technological understanding, technological implantation exercises possibly will be subject to limitations impacting the achievement of the set objective: Competitive advantage.

According to the above, a theoretical classification of technological frames exists, based on technology systemic comprehension in three elements such as organization, individual and technology itself, reviewed along the history of computer evolution, that offers us a practical way of identifying the technological phenomenon organization comprehension, that makes possible to analyze, establish and diagnose those possible impacts on the business processes and in generating competitive advantages.

A THEORETICAL CLASSIFICATION OF TECHNOLOGICAL FRAMES

Technological frame classification proposed in this paper, responds to an analysis of evolution in computation worldwide, reviewing in detail those impacts and consequences over individuals, technology and organizations, looking for patterns alike allowing to set a basic analysis platform addressing practitioners and academics in generating strategic reflections to incorporate information technology within organizations. Likewise, this proposal looks over and integrates systemic concepts addressed above, which

are reviewed and exposed by each of the technological frames suggested as relational analysis elements supporting a detailed reviewing about implications of said frame on the three proposed variables: Organization, Technology and the individual.

Information Technology/Information Systems (IT/IS) can not be ignored by administrators and managers, given that they have played a critical role in contemporary organizations. First 1950´s IT/IS developments were operational systems automating administrative processes, addressed to check and control thereof. These were followed by administrative-level systems in 1970, and then by strategic-level systems in 1980s.

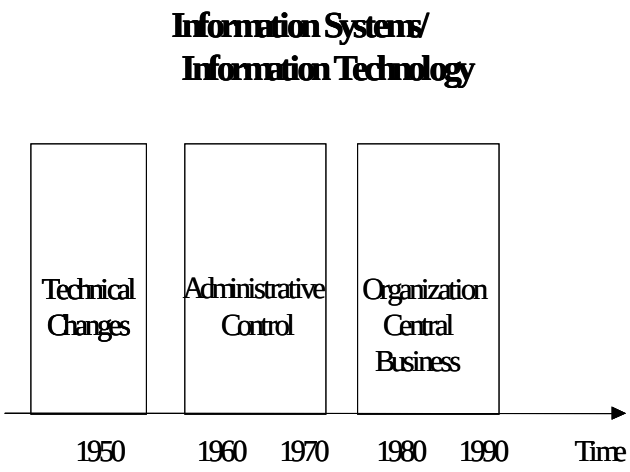

Fig. 1. IT/IS Evolution [From: LAUDON and LAUDON 1994, page 16]

By 1950, a substantial change occurred in the way organizations perceive IT/IS, as long as they represent a new way of doing things: A manual making change turned into automation one through computation systems at large scale, starts. Computing systems simplify an already existent procedure and allows to develop it in an effective and efficient way. [LAUDON and LAUDON 1994, page 17].

During 1950s and early 1960s industry increased, supporting lot of its IS/IT products called mainframes. There is an obvious domestic demand for the companies to acquire computation systems to be used in administrative process automation, as well as, product automatic manufacturing. The paradigm in force during such a period was “automation”, where IT was applied to make more efficient the existent organization. Many processes and procedures already existent were automated; and significant change rarely happen about organization functional structure, since IT/IS concentration was feeding of the said paradigm.

We can say that during such a period, the way to understand technology within organizations was highly marked based on automation paradigm. In this sense, it is suggested that there was a dominating technological frame that we will call *single*. This technological frame is characterized by an object or technological artifacts identification allowing us to make things in a more efficient way within organizational context. People build its technological comprehension about organization as a way to manipulate resources efficiently in order to reduce the delivery time, work at low costs, and have a greater control over operations.

This way of conceiving technology has an impact over the organization processes, reduces time and mistakes in production processes, and helps to keep updated administrative processes such as accounting, inventories, and the other important elements to establish administrative information effectively. In this sense, technology turns into a forced reducer of business community variety.

People notice a new role, in which they are IT/IS operators, where usually are checking the right process performance, and know them in detail, which allows them to take the right steps to follow in case of a breakdown. Based on this statement, it is suggested that processes being highly defined, -which lets an easy automation- complexity thereof is low, given that the number of distinctions that can be elaborated are defined in a possibility space that defines process and technology itself.

As the time passes, IT/IS evolve, starting a slight change of paradigm where, while an automatic process view is kept, it is recognized that automatic processes generate information that can be useful to review and maintain production levels or efficiency in administrative processes. Technology makes possible the rising of a new way of organization. Information resulting from processes is showed as a new analysis and projection factor. It turns into “to be informed”. By contrast to automation, the objective to be informed, was not to replace professional workers by computation systems, but using computation systems as a support to professional work. [BRADLEY et al, page 10].

Within this context, during 1970s the presence of a different way to understand technology is identified, which we will call the *technical* technological frame. This technological frame features a particular assumption, people must use IT/IS to get information on what they are doing, since through information, a closer control of possible failures within the process context, can be obtained. People may establish a quick activity state, whereby to inform and coordinate activities about the processes or actions they are responsible for. A middle management line arises acquiring connotation of coordinator, receiving information and reporting figures about organization output and efficiency in its business processes.

We can comment that in arising this new organizational connotation, the process variety increases, since not only are constituted and defined the technological operational process, but now communication channels with coordinators are established to whom information to be reported is delivered. In addition, information itself, involves new ways of interpreting technology, since results of technological artifacts possibly were not clearly readable, and in some cases they could be wrong because of unforeseeable situations in machines or systematized devices.

This t*echnical* technological frame suggests an organization addressed by an eminently technical management, where technology provides information to recording those events occurring in activities development, with a way to review the progress thereof and the achievement of setting goals, generation of new products, in function of the company’s goods production.

Between 1980 and 1990 use of local area networks (LAN) starts, linking with professional teams (i.e. engineers, accountants and executive officers) who had been connected to a wide area network (WAN) in order to make possible interaction with local groups, geographically spread out via its workstations (microcomputers). This perspective allows to develop global designs with the participation of different groups on line, with the possibility to have an opinion and generate draft documents enriched with inputs from each one of network integrants.

In this sense, according to Malone and Rockart [BRADLEY et al 1993, page 37] the way of doing business changes substantially, the key to survive lies in possessing new and efficient interconnection mechanisms. Computers and microcomputer networks let us to move, storage, and process information more quickly, cheaper, and between large distances than ever before.

This assertion, evidences those changes occurred since Industrial Revolution, where key elements to survive related to production economic changes and merchandize transportation. Notwithstanding that both information technologies and information systems (IT/IS) affect these processes, primary changes in networks revolution, -about the way of making business- are addressed by coordination changes rather than by production. In spite that people work as a team, they need to communicate one another, make decisions and allot resources. Therefore, coordination turns into a determining factor for establishing activities and actions between managers, vendors, purchasers, accountants, etc. and to some extent, between everybody working for the organization. [idem, page 38].

According to above, authors suggest that within few decades, computers and microcomputers networks will be remembered not just as primary technology used to generate calculus and procedures in general, but rather as technology used to generate coordination, i.e. technological coordination. This situation, will lead to reduce, in a significant way, the current coordination costs, based on control and supervision rigid structures, because network technology increases information rate and rapidity, allowing interconnection with activities isolated before, constructing a new business structure articulated by technological coordination.

This new technological evolution allows us to notice that IT/IS acquires a new connotation that we will call an *integrated* technological frame. This technological frame supposes a technological comprehension as a way to coordinate actions as a whole. It is possible to define conversations for the action in a spread out geographical context, to create new ways to visualize organization products and business. A comprehension about a constructed organization by a set of coordinated actions to reach an objective starts, and it is understood that organization businesses are the result of a set of key processes for checking organization survival.

Likewise, finding out the possibility of being related beyond the organization physical frontiers, new services making possible companies to relate each other and share information allowing them to generate value added to its business context and thus a way to manage possibilities generating from conversations with its business partners are generated.

This technological understanding suggests that people in constructing their technological frame integrate autonomy and control conditions, understanding the latter as possibilities to act and being addressed by clear business directives. This way, it is possible to develop strategies in site, tending customers demand, formulating commitments and actions to satisfy its requirements.

Then, making possible an integrated technological frame suggests a high capacity in variety coordination and management since, on the one hand, it is necessary to generate several different conversations with organization different players, that can have other technological frames associated to its processes, which can generate distinctions that may change positively the way they can see their own process, but also introduce a greater complexity to the activity they belong to.

In this integrated context of technological perception, it is critical a proper process variety management, that is, of conversations made inside of each one of them, allowing a specific actions coordination and possibilities generation to verify competitive advantage for the company to reach the proposed objectives, and in this way be prepared to face environment forces, particularly in respect to its competitors answers.

Next decade [2000-2010], according to specialists, [BOARD 1993, LAUDON and LAUDON 1994, GATES 1999, SHAPIRO and VARIAN 1999] information technology should respond with greater speed and clarity to business uncertainty challenger. It should become the organization central nervous system, that makes possible generation of responses to unexpected situations and the ability to learn, which is intimately linked with organizations internal structure: relations set defining organization identity.

According to Gates [1999, page 93] companies more and more will have to face three entrepreneurial changes.

1. More and more transactions between companies and consumers, between companies and companies and between consumer and management will be self-service digital transactions. Middlemen will have to turn into value added providers, or perish.
2. The first value added function of any company will be customer support. Human intervention in such a service will change from routine low-value added tasks to others of personal advisory about consumer's important matters: its problems or its wants.
3. Transactions pace and the need to serve a more personalized customer support will force to digital processes internal adoption on part of companies, had not adopted by reasons of efficiency.

In short, both, service and company's problems complexity will require powerful equipment to both sides of customer and employee relation.

Information Technology/Information Systems should evolve in its comprehension on part of people giving sense to actions and possibilities thereof.

For such a reason, technology comprehension should understand that IT/IS as a result of relations between individuals within the context of organization's doing, will be transformed and created by its own, reason for which it should evolve so as to reconstruct and create itself assuming those environment situations identifying as relevant changes for its social relations structure and thus that of organization. In this line, we will call this way of understanding technology, *evolutive* technological frame.

This way of understanding technology suggests that individuals recognize its role as creators of organization and recognize in its doing, a way of exploring new possibilities for creating organization. Technology processes are integrated to technological artifacts, as a recurrent conversation defining and describing action results. It makes possible the creation of permanent directives review, avoiding self-satisfaction, promoting a constant exploration of future as a field in current practice.

In this way, TI/SI, alike VSM, is attached to the whole organization as an entity cohering and coordinating the individual actions, not as a limiting to action but as a conversation questioning the business current practices, so as to recognize action patterns within environment, that its structuring configuration defines as valid changes within business environment.

An organization reaching constitute an evolutive technological frame, is aware of its main objective to remain in the long run, and benefits or earnings are temporary gifts resulting from conversations for action that individuals perform within context of its organizational doing. Likewise, it recognizes that people are those who define and constitute relations and conversations giving identity to organization, and in particular, they understand and set technologic elements as a way to transform the company, and somewhat to transform environment, which is recognized as one more element within structural conditions being defined by corporation relations.

In short, an evolutive technological frame, within VSM context, represents a way to achieve an effective viable organization, and it is constructed by itself by its business relations.

	Single	Technical	Integrated	Evolutive
Organization (0)	Efficiency and effectiveness of business processes	Registration and use of information generated by technological artifacts	Coordination of different processes and information distribution by interconnection technological mechanisms	Constant transformation and evolution of business processes, supported on organization's technological relations and constructions as an alive entity
Technology (T)	Automation	Information	Interconnection	Viability
Individual (I)	Operator	Specialist	Facilitator	Creator

Table 1. Theoretical classification of technological frames and its implications at Organizational, Technological and Individual level.

DISCUSSION

Ideas in this paper put forward a different way to face incorporation of information technology within organizations. Presentation of technological frame classification invites us to review in a more detailed way, implications of people comprehension on technology as a diagnostic element in order to establish business strategies supported by information technology.

In order to develop in practice this classification, an analysis study of technological frames was addressed in Colombia [CANO 2000c] in an organization. This research based in qualitative approach supported by interviews and semi-structured questionnaires was developed integrating operative and executive areas, looking for a detailed information about his technological understanding. In this sense, we realize two main exercises. First one, a private interview with executive area, where identify what they understand about organization identity, like a formal strategy to understand how technology support his own business understanding. This results was compare with a second exercise, where we invite approximately 200 persons, to answer three questionnaires where they showing his perception about organizational identity and how they understand technology in this own job.

The results was interesting, because of while executive area conceive, among others primary activities develop new services to customers based in a new technological advance, support area (operative area) understand technology like a way to increase operational process efficiency and decrease mistakes in process results. This both perceptions showing us a sign that a strategy supported in technology, could be align with individual technological frames, by the contrast, goal pursuing face many difficulties in order to achieve it. This result suggests, understand individual technological frame and in this sense organizational technological frame could help us to establish more effective business strategies based in technology in two sense. One, once identified technological frame compare this with a business strategy creates in order to plan organizational evolve in a new technological understanding having in horizon evolutive technological frame. And second, rebuild business strategies according with actual technological understanding to promote a natural alignment with a business objectives, because this strategies respond to daily individual activities and his technology understanding.

Results of this research were taken as inputs for performing organization strategic analyses and reviews to rethink its business and establish guidelines allowing to know its current comprehension and develop strategies for advancing to a next technological comprehension level, as suggested by exposed classification in this paper.

Technological frame classification offers a knowledge basis to undertake a review to current comprehension implications of technology by individuals, which suggests a current process analysis and technology impact thereof. This review leads the analyst to make a basic diagnosis, describing benefits and limitations of current understanding. Likewise, based on its reviewing initial conclusions, it suggests action alternatives rooted in evolution analysis of technological understanding, based on review of the other exposed technological frames, as an evolutionary proposal of information technology appropriation by individuals in the organization.

On the other hand, technological frame classification proposed, offers an evolution strategy about organizations technological comprehension supported on reason itself of any viable system: long-lasting survival. This keeping in mind, each of the presented technological frames, leads the organization to manage and administer variety inherent to business processes supported by technology, looking for the posed ideal in evolutionary technological frame, where individuals create and design organization according to its actions, giving meaning to organization viability.

Although this theoretical classification is not intended to solve the technological comprehension problem of individuals in organizations, it indeed offer a way to address discussions on the information technology subject in organizations [PRIETO F., ZORNOZA, A. And PEIRÓ, J. 1977, BROWN, S. 1997, DICKINSON, L. 1998, MALHOTRA, Y. 1998] generating new ways of materializing theoretical speeches of technology social construction, allowing to apply in a more detailed and clear way to develop tools for practitioners and academics involved in projects and studies of this category.

Finally, technological frame classification suggests organizations are in permanent growing process. That is, each individual in its relation to others constructs both, its environment and reality, which often requires to understand and review how the organization's doing is being restructured and changed. If this is true, technology as result of human relations in organizational context, is a dynamic property of each evolving organization, not just in function of technological artifacts it represents, but in function of relation among organization, technology, and individual expressions that makes technological future of a community is being day-by-day created.

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