

THE TOOLS OF THE LEARNING AND THEIR EFFECT IN THE MANAGERIAL RESULTS

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Abstract

The objective of this research is to demonstrate that information technologies (ITs) are tools of organizational learning, which generate better managerial results in the future. Therefore, they help to the creation of competitive advantage.

These evidences are gotten measuring the disposition and tools' use of the organizational learning and contrasting a series of relative hypothesis to their significant influence on the economic results - net profit and sales volume - and operative; using for it the ANOVA analysis.

At the moment, a shortage of remarkable researches identifies which tools facilitate the organizational learning process. Neither scales to measure their use and their effect in the managerial results has been identified. This situation justifies the first objective of this investigation: to develop a reliable and valid scale of measure that allows establishing an index to value the level of tools' use that facilitates the organizational learning. The methodology proposed by Malhotra (1999) has been used for this purpose. Initially, the considered tools have been the intranets, Internet, databases, electronic mail, chat, groupware, simuworlds and videoconference.

After the development of the methodology, an index of measure of the tools' use that facilitates the organizational learning has been created. This index is formed by 13 items, distributed in three subindexes. The value of the index has oscillated between 0 and 10.9. The maximum could be 13. The average value is 7.5. And, the companies use 60% of the considered instruments in this study.

A similar analysis has been developed for each one of the mentioned subindexes. The subindex of database's use is the highest, and then we can conclude that these tools are broadly used for the internal management. The second in importance is the subindex relative to Internet, because it allows to contact with current and potentials clients, suppliers and sector associations; while the electronic mail is fewer used proportionally, since its use decreases when the communities are not linked with the company (potential clients mainly).

Once developed the index of tools' use and organizational learning, our second objective has been to contrast its positive effects in the results of the company (financial as operative). The developed analyses show that the organizations that use Internet get worse net profits and bigger operative results. Also, those companies that use more databases tools reach bigger sales volumes and operative results. And finally, the results exhibit that the use of the electronic mail increases the sales volume.

KEYWORDS

Organizational learning; tools; information technologies; financial and operative results; competitive advantage.

1. INTRODUCTION

In such a turbulent and dynamic environment as the current one, the knowledge has been recognized as a basic and strategic asset¹ that explains the existence of a differentiated behavior, which will be materialized in the increment of the generated results by the organization² and the obtaining of a sustainable competitive advantage³.

The learning is the main mechanism of the knowledge's creation in the organizations. It's defined as "the capacity to drive a process that transforms the information in knowledge. The own organization and their members, individuals or groups do it, in an independent or interactive way. Furthermore, it is affected by a set of factors related with the subjects and the organizational context, and facilitated by series of tools". This process improves the managerial activity⁴, its business results⁵, and therefore its source of competitive advantages⁶.

In this way, the companies get competitive advantages if they know how to manage the organizational knowledge (Davenport et al., 1998; Earl, 2001; Schulz and Jobe, 2001). The organizational knowledge is an intangible resource. To create and maintenance the competitive advantage, the company must learn how to expand, disseminate and exploit it internally. So, the firm should know how to protect it of the expropriation and the imitation for the competitors; and share it internally and with other collaborative enterprise.

Therefore, it is necessary to appropriately manage the learning process. And ITs are very useful tools for this objective.

Considering all these antecedents, the present research has two objectives: 1) to value the level of use of the organizational learning tools and 2) to analyze their significant influence on the financial and operative results of the firms. To get these objectives, an index of use of the technological tools of organizational learning has been developed.

We begin addressing the theoretical underpinnings of the organizational learning tools. Besides, the central elements of these tools are studied, for the development of hypotheses and creation of key constructs. The methodology, analysis, and results are then presented. Finally, we discuss the findings and present implications for research and managerial practice.

CONCEPTUAL BACKGROUND

The facilitating learning tools help to appropriately develop the learning process, independently of the subject that participate in it. So, these facilitators allow the integration and make compatible of this process with the professional activity of the subject, overcoming some of the learning' inhibit barriers (like organizational structures, culture and system).

The study of the learning tools requires recognizing two different groups. First, the common learning tools, where ITs are the most important tool used by the firms and its members in the development of the organizational learning and knowledge management (Prieto and Revilla, 2004).

Second, the specific learning tools for each subject. The most important instruments are intuition (individual), communities of practice (group), dialogue (group and organization), and strategic alliances and benchmarking (organization).

¹ Justified by de Zander & Kogut (1995), Grant (1996b) and Teece et al. (1997).

² Like Davenport & Prusak (1998), DeCarolis & Deeds (1999), Ellinger et al. (2002), Bontis et al. (2002) and McKeen et al. (2006) support.

³ Like Grant (1996a, 1996b), Teece (1998), Zack (1999), Garvin (2000), Nonaka (Toyama & Nagata (2000), Barney (2001), Barney et al. (2001), Lev (2001), Von Krogh (Nonaka & Aben (2001), Heijden et al. (2002), McGaughey (2002), Díaz et al. (2003) and Lee & Choi (2003) assert.

⁴ Defended by Fiol & Lyles (1985), Garvin (1993), Slocum et al. (1994), López & López (2001) and Martínez & Ruiz (2004).

⁵ Supported by López & López (2001) and Martínez & Ruiz (2004).

⁶ Justified by Mahoney (1995), Breneman et al. (1998), Grant (1996), Hitt & Bettis (1996), Moingeon & Edmondson (1997), Lei (Slocum & Pitts (1999), Garvin (2000), López & López (2001), Santos et al. (2001), Heijden et al. (2002), Martínez (2002) and Martínez & Ruiz (2004).

2.1. The information technologies.

ITs are advance technological infrastructures of information that allow managing enormous volumes of data and information, which can be processed in the core of the organization (Daft and Huber, 1987). For this reason, these tools allow to generate, access, transfer, share, code and disseminate information (Mazón and Pereira, 1999) and knowledge (Terrett, 1998); to store both (Mazón and Pereira, 1999), to improve the communication and collaboration (McCampbell *et al.*, 1999), the experimentation (Mazón and Pereira, 1999), the continuous learning process for any subjects; and, as a result of the process, to support and to reinforce the organizational memory (Martín and Casadesus, 1999; Croasdell, 2001).

There are multiple technological tools related with the organizational learning like the intranets, Internet, databases, electronic mail, chat, groupware, simuworlds, knowledge network and videoconference.

The *corporate Intranet* works as an electronic repository of accumulated information and knowledge. If it is well structured, it supports the creation of knowledge (Newell *et al.*, 1999), and provides users the access to the available knowledge in the organization. In spite of this tool facilitates exchange (Cohen, 1998; Ruggles, 1998; Gottschalk, 2000; Araujo and Zárraga, 2001; Guadamillas, 2001), distribution and deposit of knowledge (Chen *et al.*, 2000), facilitating the creation of the organizational memory.

The *Internet* is interactive (Carpintier, 1997) and has a high potential of the reciprocity that facilitates the learning process (Almeida, 1996; Atwong *et al.*, 1996). Besides, it includes great quantity of knowledge, and a multimedia hyperlink system that links highlighted sentences of a text (hypertext) with more information about the previously clicked sentence (Carpintier, 1997), sited in any in other computer (server). It also allows the search and the exchange of information (Croasdell, 2001), and general and specific knowledge (Pérez, 1999; Guadamillas, 2001). These utilities improve and reduce the cost of communication among possible learning subjects (González, 1999; Mazón and Pereira, 1999) and, consequently, facilitate the creation of ideas more than the problems resolution (Chaston *et al.*, 2001).

The *databases* are deposits of past data, information and knowledge. All of them allow the creation and maintenance of an organizational shared intelligence and memory (Ruggles, 1998; Croasdell, 2001). So, these tools favor the leveling of the users' knowledge and abilities, and, therefore, facilitate the learning process (Chen *et al.*, 2000). For this reason, they permit that organizations learn of their experience, detect similar contexts to the previous one (Croasdell, 2001), and adapt quickly to the changing opportunities (Prahalad and Hamel, 1990).

The *electronic mail* facilitates the exchange of information between individuals or groups by on-line messages, which can contain documents, programs and texts. It allows improving their professionalism, implication levels and efficiency (Huber, 1991; Atwong *et al.*, 1996; Grandío *et al.*, 1998; Day, 1999; Bueno *et al.*, 2000; Gottschalk, 2000). Also, it permits the learning among organizations, denominated "relational learning".

The "*chat*" is "the technology that allows the dialogue in time real, where many people access to a virtual "space" in which exchange information by means of the keyboard, or even the voice and the image" (Grandío *et al.*, 1998), independently of their geographical localization or likeness (Grandío *et al.*, 1998). It facilitates the learning process by two reasons: a) the free movement of information and b) the rupture of the defense mechanisms, barriers and defensive routines, due to the identity of the participants is hidid.

The *Groupware* is any collaborative system (software based) that allows the remote communication and so the work in team, creating virtual groups of people. It permits the interaction among their participants, to generate ideas and to reinforce the existent ones, and reduces the times of decision-making. These benefits allow the opening of communication lines among their participants, their internal collaboration, and facilitate the learning of every subject that interacts through this tool, mainly in the groups.

The *simuworld* is another technological tool that facilitates the learning of any subject, because it develops techniques to anticipate what will happen in a future, starting from an initial and real situation. In fact, this instrument analyzes the influence that all their actions and decisions have in the managerial performance, identifying the segments of clients and competitors with more success, and generating tactical decisions that allow to carry out commercial plans that favor the obtaining of the organizational objectives and the optimization of performance (Fulmer, 1993; Senge and Fulmer, 1993; Fulmer and Franklin, 1994; Fulmer *et al.*, 1998).

A *knowledge network* allows to generate, access, transfer, share and code knowledge (Dinglreiter, 1998). Complementarily, it accepts the use of a common language, which is very useful for a group of people that cooperate and exchange information. Its correct use requires having a very economic

technical infrastructure, because it supports networks used previously (Gottschalk, 2000). Therefore, Palmer & Richards (1999) assert that the learning will take place in the future in the knowledge network more than inside the organizations (Kraatz, 1998).

Finally, the *videoconference* permits the simultaneous dialogue through a virtual interaction among many people (De Geus, 1997; Davenport et al., 1998; Grandío et al., 1998), and the exchange of documents, files and shows. Their use favors the frequent exchange of information and the creation, diffusion and transfer of knowledge.

2.2. Variables of business performance

Nevertheless, it is worth highlighting that opinion differs on what is understood by business performance. The business performance has been considered as a dependent variable and it is an antecedent of phenomena like the organizational mortality, the work satisfaction or the effective management of organizational learning process (Bontis et al., 2002). Therefore authors like Mintzberg et al. (1995) argue that a continuous loop exists between the learning and the business performance.

Thus, the literature has problem to identify a complete measure of business performance, because this variable is a multidimensional concept that is not easy to measure and it is more complex than the financial ratios and the indicators that typically have been studied (Revilla et al., 2005). Marsick and Watkins (1999) assert the improvement in organizational performance is reflected through the financial and not financial assets. However, other authors forget the financial measures, because they don't consider the clients' satisfaction, the quality, the cycle of life and the employee's motivation. Kaplan and Norton (2005) then propose us to improve the use of the operative measures. For this reason, both kind of performance variable have been considered in this research.

The financial results have been measured using two variables, net profits and sales volume.

Finally, business performance can be understood in terms of the changes in organizational behavior as a result of learning process. Therefore, a simple measure doesn't describe all the aspects and conditions of the firm, and doesn't reflect their mainly results (Ellinger et al., 2002). For this reason, another not financial approach has been chosen to measure the organizational learning effects (Revilla et al., 2005), and these are the operative results. We have used the Kaplan and Norton (1996) orientations due to the study of the internal processes. The main improvements in the internal processes of this industry have been identified in the year 1999, in the chapter dedicated to "The agrarian politicians in the Region of Murcia: an application of the method Delphi", included in the Report on the reformation of the PAC and the agrarian sector of the Region of Murcia (1999), published by Economic and Social Council of the Region of Murcia. And a scale type Likert of 7 points has been used.

The considered operative results are the improvement of a) the production's programming and planning, b) the productive process (Revilla et al., 2005), c) the product (Revilla et al., 2005), d) the work conditions, e) the future firm' projection, f) the processes of decision making, g) the organization of the work, h) the fixation of objectives and the elaboration of their strategy, i) the increase of the quantity taken place with the same resources –productivity- (Revilla et al., 2005), k) the increment of the quality (Montes et al., 2005) and l) the reduction of costs.

2.3. Hypothesis to contrast

Theoretical foundations of knowledge and learning process have been established. The main technological tools that facilitate the organizational learning are identified. From the above, in order to analyze the relationship between organizational learning tools and business performance, we opted to consider first of all the existing relationship between organizational learning tools and financial results, which have been the main focus of investigations into business strategy. So, the operative results have been considered as a measure of firm performance.

In conclusion, in agreement with the above, the following working hypotheses can be drawn up:

- H1: organizational learning tools positively affect the net profit.
- H2: organizational learning tools positively affect the sales volume.
- H3: organizational learning tools positively affect operative results.

To contrast the outlined hypotheses it will create an index of the tools' use of the learning in the organizations. Next, the methodology is exposed.

3. Methods

3.1. Sample and procedures

With the aim of testing these hypotheses, an empirical study was carried out on large Spanish food and agriculture firms, due to the learning process is more structured in this kind of firms. The firms were selected using the SABI database. We chose companies with 1 Meuro of sales volume, which gave us an objective population of 173 firms. The questionnaire was delivered by means of personal survey. It was addressed to the general manager or to the HR manager so as to obtain one response per firm. The surveys were carried out in February 2002. One hundred and thirteen questionnaires were returned, of which all were considered valid, which represents a response rate of 65.3% and 5.56% sampling error for a confidence interval of 95%.

3.2. Scale development and validation

Our scale development and refinement is based upon a six-stage approach (Malhotra, 1999). In stage one, we revise the previous theoretical approach. The choice of the variables representative of the tools was driven after a through revision of both the organizational learning literature and of the measurement tools developed up to present of its assessment.

In stage two, we establish precise definitions and measurement items for each construct. Table 1 shows the different components and their items.

Table 1: Components of organizational learning' technological Tools

Technological Tool	Uses
Have the firm intranet?	It is used to obtain current clients' information. It is used to obtain potential clients' information. It is used to obtain suppliers' information. It is used to obtain information of sector associations.
Is there Internet link?	It is used to obtain current clients' information. It is used to obtain potential clients' information. It is used to obtain suppliers' information. It is used to obtain information of sector associations.
Have the firm databases?	To the staff' technical profile To planning and programming of production To stocktaking and storehouse management To commercial management
Has the firm electronic mail?	It is used to obtain current clients' information. It is used to obtain potential clients' information. It is used to obtain suppliers' information. It is used to obtain information of sector associations.
Has the firm chat?	
Has the firm groupware?	As system of help to the decision-making
Has the firm simuworlDs?	Simulation of business processes
Has the firm videoconference?	

In stage three, items selection facilitated by a Delphi Methodology. The panels of experts from firms in the same industry (fifteen were registered) were asked to identify the organizational learning tools in two 'rounds', which were administered by personally interviewing.

In stage four, the preliminary test was developed interviewing other managers from the same sector. Table 2 shows the definitive component of the organizational learning tools.

In stage five, the data were collected in February 2002, and their indications of reliability and validity were measured. In stage six, we further refine and validate our measures using survey data collected on the scales developed in previous stage.

Table 2: Definitive components of organizational learning' technological tools

Technological Tool	Uses
Is there Internet link?	It is used to obtain current clients' information. It is used to obtain potential clients' information. It is used to obtain suppliers' information. It is used to obtain information of sector associations.
Have the firm databases?	To planning and programming of production To stocktaking and storehouse management To commercial management
Has the firm electronic mail?	It is used to obtain current clients' information. It is used to obtain potential clients' information. It is used to obtain suppliers' information. It is used to obtain information of sector associations.

The reliability is one of the most critical elements in assessing the quality of the construct measures (Churchill, 1979) and it is a necessary condition for scale validity. It indicates to what extent the different items are coherent with each other and whether they can be used to measure a specific magnitude. This scale exhibits excellent reliability with estimate of .81.

3.3. Index of Organizational Learning Tools

In the literature revised, a measurement of the organizational learning tools has not been detected. Recently, Martínez (2002) and Martínez and Ruiz (2004) have made very interesting contributions in this field, but in our opinion, it is necessary the creation of an index that allows to measure clearly and simply the level of use of such instruments, being this one of the main contributions of this investigation.

Once exposed the necessity of an index of organizational learning tools, this is defined like a quantitative indicator *that allows to measure the level of use of these tools, keeping in mind the different technological instruments for the attainment of new knowledge implanted in the organization*, appearing reflected in the following expression:

$$IHA = INTER + BDAT + EMAIL$$

Where:

IHA = index of use of the organizational learning tools

INTER = indicators of use of Internet

BDAT = indicators of use of databases

EMAIL = indicators of use of the electronic mail

4. CONTRASTING THE THEORETICAL MODEL

In order to test the proposed hypotheses, we have estimated an index of use of organizational learning tools, calculating previously each subindex (Internet, databases and electronic mail). Next, ANOVA analysis of a factor has been carried out for each one of the subindexes and the different dependent variables (net profits, sales volume and operative results). Some applied ANOVA techniques on averaged data, drawing (mean) performance comparisons over firms at different levels or ranges of organizational learning tools.

To know arithmetic mean that differs among the different categories of the used variables of results, the Bonferroni contrast or Tamhane contrast have been used, based on the results of the test of Levene.

5. RESULTS

Table 3 shows the descriptive information of use index of organizational learning tools and its own subindexes. As it is observed, the agricultural firms use an average of 7.5 instruments of 13 tools considered. The medium is 7 practices. These results show us that the electronic mail is the tool less used (mean is of 2.5 on 5 included practices).

Table 3: Descriptive information about organizational learning tools and their components.

	Index of organizational learning tools' use	Subindex of Internet' use	Subindex of database' use	Subindex of email' use
Items number	13	5	3	5
Arithmetic mean	7.5	2.7	2.3	2.5
Medium	7.6	2.9	2.4	2.4
Minimum	0.0	0.0	0.0	0.0
Maximum	10.9	4.6	3.0	4.0

The results of ANOVA analyses for each subindex and factor Net profit show that the use of Internet has a significantly influence in this dependent variable, while the others not.

Table 4: ANOVA results to Factor Net Profit (every subindex).

Net Profit	Subindex of Internet' use			Subindex of database' use			Subindex of email' use		
	Mean	N	ANOVA Test	Mean	N	ANOVA Test	Mean	N	^a ANOVA Test
1. High net profit	2.04	25							
2. Intermediate net profit	1.85	64	(3)						
3. Losses	2.32	19	(2)						
Inter-group Significant Results			<i>0.016^a</i>			^b NS			^b NS

^aVariance analysis using statistical Tamhane test. ^bNS: no significant.

Table 4 exhibits the existent significant differences among companies with intermediate benefits (1.85) in front of firms get losses (2.3), where the last ones have a significantly superior Internet use. The reason is some big companies suffered big losses in the following exercises at the moment of the study (and disappeared).

Table 5: ANOVA results to Factor Sales Volume (every subindex).

Sales Volume	Subindex of Internet' use			Subindex of database' use			Subindex of email' use		
	Mean	N	ANOVA Test	Mean	N	ANOVA Test	Mean	N	^a ANOVA Test
1. High				2.14	22	(3)	2.65	32	(3)
2. Medium				2.53	53	(3)	2.34	38	(3)
3. Small				1.80	31	(1,2)	1.75	36	(1,2)
Inter-group Significant Results			^c NS			0.009^a			0.001^b

^aVariance analysis using statistical Bonferroni; ^bVariance analysis using statistical Tamhane test. ^cNS: no significant.

Table 5 shows that the subindexes of databases and electronic mail used have significant influence in the sales volume, except Internet. If we consider the subindex of databases use, some significant differences are appreciated among the companies with high levels of sales volume (high and medium) in relations with small ones, getting bigger use the firms with high sales volume. On the other hand, the ANOVA analysis for the subindex of electronic mail use illustrates significant differences among all the categories of companies, although firms with small sales volume use more this tool than the bigger ones.

Table 6: ANOVA results to Factor Operative Performance (every subindex).

Operative Results	Subindex of Internet' use			Subindex of database' use			Subindex of email' use		
	Mean	N	ANOVA Test	Mean	N	ANOVA Test	Mean	N	^a ANOVA Test
1. High	3.12	24	(2)	3.21	24	(3)			
2. Medium	2.56	62	(1)	2.69	55	(3)			
3. Small	2.39	18		2.14	28	(1,2)			
Inter-group Significant Results			0.058 ^a			0.002 ^b			^c NS

^aVariance analysis using statistical Bonferroni; ^bVariance analysis using statistical Tamhane test. ^cNS: no significant.

Table 6 demonstrates the Internet use has a significant relation with the operative results. Organizations with high level of Internet use get bigger operative results (3.12), in relation to those that have medium levels (2.56). So, the subindex of databases use shows significant differences among all the categories of companies, getting better operative results the firms with high database use.

After exposing the results of statistical analyses, and regarding the contrast of the established hypotheses, we can assert:

- H₁: Organizational learning tools positively affect the net profit.
- H_{1a}: Internet use positively affects the net profit.
- H_{1b}: Databases use positively affects the net profit.
- H_{1c}: Electronic mail use positively affects the net profit.

Regarding the net profit, the ANOVA analysis accepts the hypothesis H_{1a}, due to companies with big losses use more Internet tools than firms with medium profits. This situation come from big agricultural companies were damaged and disappeared in next three years at the moment of study. The rest of the sub-hypothesis doesn't confirm, because the net profit has not significant relationship with the databases and electronic mail uses. Therefore, the general hypothesis is partially accepted.

- H₂: Organizational learning tools positively affect the sales volume.
- H_{2a}: Internet use positively affects the sales volume.
- H_{2b}: Databases use positively affects the sales volume.
- H_{2c}: Electronic mail use positively affects the sales volume.

The hypothesis 2 is partially accepted, because the databases and the electronic mail have a positive influence in the sales volume. Although, the Internet use has not a significant relationship with this variable. Therefore, we can conclude that those organizations with high databases and electronic mail uses get bigger sales volumes.

- H₃: Organizational learning tools positively affect operative results.
- H_{3a}: Internet use positively affects the operative results.
- H_{3b}: Databases use positively affects the operative results.
- H_{3c}: Electronic mail use positively affects the operative results.

As the previous hypothesis, the hypothesis 3 is partially accepted, because the Internet and databases use have a positive influence in the firms' operative results. The electronic mail use has not any significant relationship in this variable. Therefore, we can conclude that those organizations with high Internet and databases uses get better operative results.

6. CONCLUSIONS AND DEBATE

Numerous papers emphasize the importance of the organizational learning to maintain and create competitive advantage in a changing and dynamic environment. This process transforms the information in knowledge. The consideration of knowledge as an essential strategic resource and the company's ability to create it and apply it like a fundamental capacity constitute the foundations of knowledge based view of the firm. However, theoretical framework does not indicate that tools facilitate the learning process in the organizations. Small researches analyse the influence of these tools in the results, financial and not financial (operative).

The aim of this study has been to assess the contribution of organization learning tools towards the achievement of firm's results. We have obtained empirical evidence on the contribution of organization learning tools to both financial and operative results, which has important implications for strategic management.

Therefore, the first objective of this research has been to develop an index to value the level of organizational learning tools' use. The main tools are intranets, Internet, databases, electronic mail, chat, groupware, simuworld and videoconference. To get a reliable and valid scale of measure, it is necessary the development of a methodology. This methodology has demanded the elimination of certain items, based on an analysis Delphi carried out with experts of the sector and to the developed tests pilot. For this reason, the final index is formed by three subindexes: the subindex of Internet use, the subindex of databases use and the subindex of electronic mail use.

The total items considered in the index of organizational learning tools' use is 13. The components of this index represent the tools that usually facilitate the organizational learning, which favour the communication and collaboration with clients (current and potentials), suppliers, and sector associations (relational learning). This characteristics help to develop optimal professional activity of all learning subjects. So, these tools a) improve the internal management of the existent data and information, b) create knowledge, c) use databases to production's planning and programming, d) help to the stocktaking and storehouse management, and e) enhance commercial management.

In the present research, the index of use of the organizational learning tools has been applied the agricultural and foods firms of the Region of Murcia. The obtained index has shown a high internal consistency, globally as each subindex independently, being obtained high levels of the alpha of Cronbach.

The punctuation of the index of use of the organizational learning tools has oscillated between 0 and 10.9, getting the average value of 7.5. Therefore, its grade of use is not very high, but if acceptable for this kind of organizations; because they use 60% of the considered instruments in this study.

A similar analysis has been developed for each one of the mentioned subindexes, getting highest values in the subindex of databases use, what allows us to conclude that these tools are broadly used in the firm's management. Internet is the second tool in importance, because permits to contact with current and potential clients, suppliers and sector associations; while the electronic mail is proportionally less used, due to its use decreases when the population are not linked with the company (potential clients mainly).

Our second objective is contrast the direct significant contribution of organizational learning tools to financial and operative results. The ANOVA analysis shows that the organizations that use more Internet tool get worse net profits and bigger operative results. These analyses also justify that the companies that use more databases obtain bigger sales volumes and operative results. And finally, they expose that the use of the electronic mail increases the sales volume.

Therefore, organizational learning tools influence differently in the financial and operative results. In this manner, we can partially validate H1, H2 and H3. These results give support to the importance of organizational learning as a source of competitive advantages, which has been stated in earlier works in this field.

We believe that study of other sectors in the same and different geographical area should occur, but we consider that this paper's conclusions can extend to other sectors and regions. Anyway, this research reflects our concern to find a significant relationship among the use of organizational learning tools and organizational results. Our final objective is to help the organizations to collect information and to transform it in useful knowledge, which help to their decision-making process and, in definitive, their organizational performance.

References

- Almeida, P., 1996. Knowledge Sourcing by Foreign Multinationals: Patent Citation Analysis in the U.S. Semiconductor Industry. *Strategic Management Journal*, Vol. 17, No 10, Winter special issue, pp. 155-165.
- Araujo Cabrera, U. and Zárraga Obery, C., 2001. La Actividad Directiva desde la Perspectiva de la Dirección del Conocimiento. *II Encuentro Iberoamericano de Finanzas y Sistemas de Información*, November, pp. 342-353.
- Atwong, C.T.; Lange, I.L.; Doak, L. and Aijo, T.S., 1996. How Collaborative Learning Spans the Globe. *Marketing News*, 8/12/96, Vol. 30, No 17; pp. 16-18.
- Bontis, N.; Crossan, M.M. and Hulland, J., 2002. Managing an Organizational Learning System by Aligning Stocks and Flows. *Journal of Management Studies*, Vol. 39, No 4, June, pp. 437-469.
- Bueno Campos, E.; Byosiére, P.; Salmador, M.P. and Senoo, D., 2000. *La Construcción de una Red de Conocimiento Transorganizativa*. En E. Bueno and M.P. Salmador (Eds.) *Perspectivas sobre dirección del conocimiento y capital intelectual*. Instituto Universitario Euroforum Escorial, Madrid; pp. 46-49.
- Carpintier Santana, R., 1997. *Internet Hoy, Cómo Hacer Negocios en la Red*. RA-MA Editorial.
- Chaston, I; Badger, B.; Mangles, T. and Sadler-Smith, E., 2001. The Internet and E-Commerce: an Opportunity to Examine Organizational Learning in Progress in Small Manufacturing Firms. *International Small Business Journal*, January-March, Vol. 19, No 2, pp. 13-30.
- Chen, Y.S.; Pete Chong, P. and Justis, R.T., 2000. An Intranet-Based Knowledge Repository: a Structure for Learning Organizations in Franchising. *Human Systems Management*, Vol. 19, No 3, pp. 277-284.
- Churchill, G. A., Jr., 1979. "A Paradigm for Developing Better Measures of Marketing Constructs". *Journal of Marketing Research*, vol. 16, (February), pp. 64-73.
- Cohen, D., 1998. Toward a Knowledge Context: Report on the First Annual U.C. Berkeley Forum on Knowledge and the Firm. *California Management Review*, Vol. 40, No 3, Spring, pp. 22-39.
- Croasdell, D.T., 2001. It's Role in Organizational Memory and Learning. *Information Systems Management*, Vol. 18, No 1, Winter, pp. 8-11.
- Daft, R.L. and Huber, G.P., 1987. How Organizations Learn: a Communication Framework. *Research in the Sociology of Organizations*, Vol. 5, pp. 1-36.
- Davenport, T.H. and Prusak, L., 1998. *Working knowledge: How Organizations Manage what They Know*. Boston, MA: Harvard Business School Press.
- Day, R., 1999. Learning Organizations: the Future. *NZ Business*, Vol. 13, No 1, February, pp. 55-56.
- De Geus, A.P., 1997. The Living Company. *Harvard Business Review*, Vol. 75, No 2, March-April, pp. 51-59.
- Díaz Díaz, N.L.; Aguilar Díaz, I.; De Saa Pérez, P., 2003. El Conocimiento Organizativo Tecnológico y la Capacidad de Innovación. Evidencia para la Empresa Industrial Española. *XIII Congreso Nacional De ACEDE*. Salamanca, September.
- Earl, M., 2001. Knowledge Management Strategies: Toward a Taxonomy. *Journal of Management Information Systems*, Vol. 18, No 1, pp. 215-233.
- Ellinger, A.D.; Ellinger, A.E.; Yang, B. and Howton, S.W., 2002. The Relationship between the Learning Organization Concept and Firms' Financial Performance: an Empirical Assessment". *Human Resource Development Quarterly*, Vol. 13, No 1, Spring, pp. 5-21.
- Fulmer, R. M., 1993. The Tools of Anticipatory Learning. *Journal of Management Development*, Vol. 12, No 6, pp. 7-14.
- Fulmer, R.M. and Franklin, S.G., 1994. The Merlin Exercise: Creating your Future through Strategic Anticipatory Learning. *Journal of Management Development*, Vol. 13, No 8, pp. 38-43.
- Fulmer, R.M.; Gibbs, F. and Keys, J.B., 1998. The Second Generation Learning Organizations: New Tools for Sustaining Competitive Advantage. *Organizational Dynamics*, Autumn, Vol. 27, No 2, pp. 6-20.
- Grandío Botella, A.; Chiva Gómez, R and Montesinos, C., 1998. Aprendizaje Organizativo: Construcción de un Instrumento de Investigación. *VIII Congreso Nacional de ACEDE: Empresa y Economía Institucional*. Las Palmas de Gran Canaria, September.
- González Romero, A., 1999. Los Intangibles en la Nueva Economía Española, Estrategias Públicas Prioritarias. *Economía Industrial*, No 329, pp. 81-98.
- Gottschalk, P., 2000. Strategic Knowledge Networks: The Case of IT Support for Eurojurist Law Firms in Norway. *International Review of Law, Computers & Technology*, March, Vol. 14, No 1, pp. 115-129.

- Guadamillas Gómez, F., 2001. La Gestión del Conocimiento como Recurso Estratégico en un Proceso de Mejora Continua. *Alta Dirección*, No 217, May-June, pp. 199-209.
- Huber, G.P., 1991. Organizational Learning. The Contributing Processes and the Literatures. *Organization Science*, Vol. 2, No 1, January-February 1991, pp. 88-115.
- Kaplan, R.S. and Norton, D.P., 2005. The Balanced Scorecard: Measures that Drive Performance. *Harvard Business Review*, July/ August, Vol. 83, No 7/8, pp. 172-180.
- Marsick, V. J. and Watkins, K. E., 1999. *Facilitating Learning Organizations: Making Learning Count*. Aldershot, England: Gower.
- Martín Rubio, I and Casadesús FA, M., 1999. Las TIC como Factor Determinante del Aprendizaje Organizativo. El Caso de una Empresa Suministradora en el Sector del Automóvil. *Economía Industrial*, No 326, pp. 73-84.
- Martínez León, I.M., 2002. El Aprendizaje en las Organizaciones. Aplicación al Sector Agroalimentario. *Tesis Doctoral*, Universidad Politécnica de Cartagena.
- Martínez León, I.M. and Ruiz Mercader, J., 2004. Medida del Aprendizaje en las Organizaciones y su Influencia sobre los Resultados. *XIV Congreso Nacional De ACEDE*. Murcia, September.
- Mazón, C. and Pereira, P., 1999. Las Empresas Industriales y las Tecnologías de Internet. *Economía Industrial*, No 329, pp. 99-108.
- McCampbell, A.S.; Clare, L.M. and Gitters, S.H., 1999. Knowledge Management: The New Challenge for the 21st Century. *Journal of Management Journal*, Vol. 40, No 6, pp. 172-179.
- Mintzberg, H., Quinn, J. B. and Voyer, J., 1995. *The Strategy Process*. Englewood Cliffs, NJ: Prentice-Hall.
- Montes Peón, J.M.; Pérez López, S. and Vázquez Ordás, C.J., 2005. La capacidad de aprendizaje en las empresas españolas. Un análisis empírico. *Revista de Investigación en Gestión de la Innovación y Tecnología*.
- Newell, S.; Swan, J.; Galliers, R. and Scarbrough, H., 1999. The Intranet as a Knowledge Management Tool? Creating New Electronic Fences. En M. Khosrowpour (ed.) *Managing Information Technology Resources in the Next Millennium, Proceedings of the 1999 IRMA International Conference*, 17-19 May, Hershey, USA, pp. 612-619.
- Nunnally, J.C., 1978. *Psychometric theory*. New York: McGraw Hill.
- Pérez Subías, M., 1999. Internet, Usos y Usuarios en España. *Economía Industrial*, No 326, pp. 113-121.
- Prahalad, C.K. and Hamel, G., 1990. La Organización por Unidades Estratégicas de Negocio ya no Sirve. *Harvard Deusto Business Review*, primer trimestre, No 91, pp. 47-64.
- Prieto, I.M. and Revilla, E., 2004. El Intercambio entre la Gestión Humana y Estructural del Conocimiento: una Investigación Empírica. *XIV Congreso Nacional De ACEDE*. Murcia, September.
- Revilla, E.; Acosta, J. and Sarkis, J., 2005. Value Perceptions and Performance of Research Joint Ventures: an Organizational Learning Perspective. *Journal of High Technology Management Research*, Vol. 16, pp. 157-172.
- Ruggles, R., 1998. The State of the Notion: Knowledge Management in Practice. *California Management Review*, Vol. 40, No 3, Spring, pp. 80-89.
- Schulz, M. and Jobe, L., 2001. Codification and Tacitness as Knowledge Management Strategies: an Empirical Exploration. *Academy of Management Journal*, Vol. 44, No 4, pp. 661-681.
- Senge, P. M. and Fulmer, R.M., 1993. Simulations, Systems Thinking and Anticipatory Learning. *Journal of Management Development*, Vol. 12, No 6, pp. 21-33.
- Terret, A., 1998. Knowledge Management and the Law Firm. *Journal of Knowledge Management*, Vol. 2, No 1, pp. 67-76.