Structural Integrity of Strategic Intelligence: an Assessment in a Cooperative Corporation

Ana Cristina Fachinelli†
Universidade de Caxias do Sul

Alazne Mujika AlberdiΩ
Universidade de Deusto

ABSTRACT

The process of transforming information into useful and dynamic knowledge has different structural levels that can determine the development of strategic intelligence (SI) in an organization. That is, the way an organization develops and organizes its intelligence actions characterize the structural integrity of the process and can determine its strategic role. This article aims to analyze the relationship between the structural integrity of the processes of SI and its strategic dimension in a group of 44 companies that are part of a large cooperative of companies in the Autonomous Community of the Basque Country in Spain. Data were collected from the general managers, R&D directors and innovation directors. To measure the SI constructs, a multi-item scale was adopted from prior studies. To identify a typology of companies, cluster analysis was performed. This study confirms that the more solid and organized the structure of the process of strategic intelligence is, the greater the strategic potential of the activity will be.

Keywords: Strategic intelligence. Structural integrity. Knowledge. Intelligence. Strategy.
1 INTRODUCTION

Many studies pertaining to the field of management have recognized the benefits of intelligence activities aimed at improving the decision-making process. Such studies note that a thorough understanding of the organizations involved in a decision-making process and their environments is essential to the integration of strategic intelligence at various organizational levels (VIITANEN; PRITTIMAKI, 2006). The benefits of intelligence activities have also been recognized by the business world, as illustrated empirically by the accelerated development of such activities. Depending on the environment, however, intelligence activities develop with distinctive characteristics that are influenced by geographical, cultural, economic and other natural conditions (for scholarly work exploring these differences in depth, especially between countries, see CALOF; VIVIERS, 2005; FLEISHER; WRIGHT, 2009; MARTRE, 1994).

Despite the influence of contextual variation, some studies have demonstrated that organizational practices are a determinant of intelligence. In a recent work aimed at defining “intelligence” by means of a synchronic exploration of the use of competitive intelligence (CI) in different organizations, Brody (2008) concluded that “An examination of parameters of CI suggests a boundary-spanning field. It is represented (…) as a body of varying practices, as asposed to a body of practices and process; as a body of knowing, a body of practice, or a body of acting rather than a body of knowledge.” In other words, intelligence activities can be measured as an evolving process, even as they are situated within and influenced by environments that are subject to change.

Following that logic, in order to understand how the CI practices of a specific company are organized, it is necessary to check how its intelligence processes are structured. However, for such understanding to make sense in a determined reality, or even for an organization to be able to examine itself with respect to its activities, it is necessary to carry out an assessment over a body of knowledge that considers the intelligence practices as a structural base of the process. That is, the way an organization develops and organizes its intelligence actions characterize the structural integrity of the process and can determine its strategic role.

Thus, in order to study this statement, this article intends to analyze the relationship between the structural integrity of the processes of intelligence and its strategic character in a
group of companies that are part of a large cooperative of companies in the Autonomous Community of the Basque Country in Spain.

2 STRATEGIC INTELLIGENCE

Currently, the intelligence literature uses distinct denominations: competitive intelligence, business intelligence, strategic intelligence, economic intelligence, marketing intelligence. The difference among the expressions is much smaller than the conceptual convergence (FACHINELLI et al., 2010). An analysis comparing the intelligence systems around the world, carried out by Henri Martre (1994), already indicated the use of different denominations for the intelligence activity. Even so, convergence exists and it happens in the recognition of the importance of strategic engineering information to deal with competitive forces (MARTRE, 1994). In this sense, and assuming the conceptual convergence of denominations, here we use the strategic intelligence (SI) concept since it seems to be more appropriate when talking about the strategic attributes of the information process (FACHINELLI et al., 2010).

Strategic intelligence (SI) refers to the interpretation and use of information for a specific purpose as well as the continuous relationship between types of information and their roles in generating functional strategies (GUILHON, 2004; JAKOBIAK, 2004; LEVET, 2001; FAYARD, 2000; BESSON; POSSIN, 1997). SI organizes intellectual resources into an information process. In other words, in analogy with human intelligence, it is differentiated and creates relationship between various types of information that are used to identify solutions for different situations. In more functional terms, it is the gathering, processing, analysis, and dissemination of useful information for economic players and is strongly related to its context (MARTRE, 1994). More specifically, SI serves the highest level of decision making by enabling reflection in uncertain situations (BESSON; POSSIN, 1997). However, as a subject of research, despite being based on well-established concepts, SI needs to progress beyond its theoretical-scientific fundamentals. One of the debates in this field is about the process-product distinction. There is a tendency to characterize SI as a process (MILLER, 2001; KAHANER, 1996), that is, a set of methods structured in sequence in well-defined chronological periods. In addition, studies show that SI is a dynamic process that evolves with the environment while also evolving its own definitions of activities. Actually, according to Comai (2004, p. 407) “the more systematic the function, the more formalized the function will be”. The SI process is related to the process of defining needs and collecting, analyzing and distributing the intelligence to decision makers (COMAI, 2004). Thus, the
more solid and organized the structure of the process of strategic intelligence is, greater the strategic potential of the activity will be. Therefore,

*H1: Structural integrity is positively related to the strategic character of the processes of strategic intelligence*

Despite the development of research in recent years, epistemologically SI can still be considered a non observable phenomenon, or as similar to a group of latent variables, because it requires a definition that consolidates its components in order to be understood. Therefore, assessing the structural integrity of the process of strategic intelligence is necessary to seek their “constructs,” which Edwards & Bagozzi (2000) define as a conceptual term used to describe a phenomenon of theoretical interest. When the need arises to measure a construct, it becomes necessary to involve various dimensions and to use multiple scales. With this in mind, this study has been designed to examine the major stages of the SI process (DOU, 1995; FULD, 1995; GUILHON, 2004; MARTRE, 1994; ROUACH, 1996) by using the existing literature to develop a valid conceptual framework to define the SI construct (FOLINAS, 2007; JAWORSKI, MACINNIS; KHOLI, 2002; KERR et al., 2006; SAAYMAN et al., 2008; WRIGHT; CALOF, 2006).

A second hypothesis of the current study is that when evaluating the structural integrity of SI processes, it is possible to characterize the typology of groups of companies within a larger group. Existing studies that create typologies of companies with regard to their use of SI tend to be limited to the principal attributes of the SI that was applied: attitude, gathering, use, and location (WRIGHT et al., 2002). Here we extend such analyses to define a typology based on the level of structure present in the processes of SI within the parameters of a conceptual scale. Therefore,

*H2: In a collective assessment, analysis of structural levels of SI processes is positively related to the definition of a typology of groups of firms.*

3 METHOD

Data were collected from the general managers, R & D directors and innovation directors of the 44 industrial companies of a group of enterprises belonging to a cooperative corporation located in the Autonomous Community of the Basque Country in Spain. This group is the most important economic group in the Basque Country, and the seventh largest in Spain. It is a cooperative corporation with 111 cooperatives divided into four areas: Finance,
Industry, Distribution and Knowledge. The group currently employs more than 85,000 people. The demographic characteristics of responding firms are presented in Table 1.

Table 1 - The Demographic Characteristics of Responding Firms

| Age of firms       |     |
|--------------------|-----|
| Less than 20 years | 9   |
| 21 - 51            | 30  |
| Over 52            | 3   |

| Number of employees |     |
|---------------------|-----|
| Fewer than 100      | 17  |
| 100 – 500           | 20  |
| Over 500            | 7   |

| Annual revenues (million euros) |     |
|---------------------------------|-----|
| Less than 40                    | 28  |
| 41 – 200                        | 10  |
| Over 201                        | 6   |

| Number of exporting firms       |     |
|---------------------------------|-----|
| Exporting firms                 | 31  |
| Others                           | 13  |

Source: Prepared by the authors.

Furthermore, in 32 companies, the questionnaires were answered by directors in the field of R&D, innovation and management projects. In 24 of these 32 cases, these executives had been employed by their respective companies for over 10 years.

To measures the constructs, a scale was adopted from prior studies (FACHINELLI et al., 2010). This instrument coincides with the levels of development scale proposed by Churchill (1979) and Rossiter (2002). The individual items of the scale were derived from a body of theoretical knowledge and structures based on the principal stages of the process of SI (DOU, 1995; FULD, 1995; GUILHON, 2004; MARTRE, 1994; ROUACH, 1996) and from the constructs and frameworks used in recent works in the field (JAWORSKI; MACINNIS; KOHL, 2002; WRIGHT; CALOF, 2006; KERR et al. 2006; FOLINAS, 2007; SAAYMAN et al., 2008). The instrument was adapted to accommodate the cultural and linguistic characteristics of local companies after consulting with various experts. The instrument included 28 items in addition to the descriptive variables mentioned above. The 28 items that form the instrument were measured based on five-point Likert scales (Appendix 1).

To evaluate the validity and reliability of the measurement instrument for this study, we performed principal components analysis and analysis of internal consistency. The analysis of the principal components was done with varimax rotation. The components with an eigenvalue greater than 1 were dropped. Five components were identified that explain 75.111% of the total variance. Table 2 shows that the first two components accounted for
58.849% of the total variance. In fact, the first component alone accounted for 51.175% of the total variance.

| Component | Initial Eigenvalues | Extraction Sums of Squared Loadings | Rotation Sums of Squared Loadings |
|-----------|---------------------|-------------------------------------|----------------------------------|
|           | Total               | % of Variance                       | Cumulative                       | Total               | % of Variance                       | Cumulative                       |
| 1         | 14.329              | 51.175                              | 51.175                           | 6.767               | 24.168                              | 24.168                           |
| 2         | 2.149               | 7.674                               | 58.949                           | 4.892               | 17.472                              | 41.639                           |
| 3         | 2.005               | 7.162                               | 66.011                           | 3.616               | 12.914                              | 54.554                           |
| 4         | 1.320               | 4.713                               | 70.724                           | 3.517               | 12.560                              | 67.114                           |
| 5         | 1.228               | 4.386                               | 75.111                           | 2.239               | 7.997                               | 75.111                           |
| …        | 0.018               | 0.063                               | 100.00                           |                     |                                    |                                  |

Extraction Method: Principal Component Analysis

In the analysis of internal consistency, Cronbach’s alpha was calculated.

| Dimension                                                                 | Nº of items | Cronbach’s Alpha |
|---------------------------------------------------------------------------|-------------|-----------------|
| D1 – The strategic character                                              | 11          | 0.944           |
| D2 – Structural integrity of the SI process                              | 6           | 0.909           |
| D3 – Corporate character of the SI process                               | 4           | 0.844           |
| D4 – Information as a support for the decision-processes                 | 4           | 0.843           |
| D5 – The spontaneous character of the IE processes                        | 3           | 0.733           |

4 ANALYSIS

In order to calculate the one-to-one relationship between the strategic character and the structural integrity of SI, we calculated the correlation between the variables that comprise factor 1 (strategic character – D1) and factor 2 (structure – D2). The result was 0.718 (p <0.001) indicating that H1 is supported.

With that result, we can show the distributions of the variables and their corresponding dimensions, pertaining to factor 1 and 2 (Figure 1), and also the distributions of the individual companies between these two factors (Figure 2).
The analysis of the distribution of the variables in the first two factors demonstrates the following:

- The first factor contains both the characteristics that refer to the presence of a high structural level of SI (corporate character, strategic character, structural integrity of the SI process, and the use of information as a support for the decision-making process) and their opposites, characteristics of spontaneous, rather than structured, SI. It is clear that this first factor represents the principal characteristics that differentiate the sampled companies in terms of their structural levels of SI.

- The second factor contrasts the strategic character (high structural level) to the spontaneous character (low structural level) of SI processes. This factor also, although to a lesser extent, contrasts the organization and registration of information to the use of information as a support for the decision-making process.

The distribution of the individual companies in these two factors can be visualized in the figure below.
The first quadrant of Figure 2, consisting of positive values of factors 1 and 2, represents the strategic character and high structural level of SI. The companies found in this quadrant use information as a support in the decision-making process and organize and register this information within SI processes that have a corporate character.

The second quadrant consists of positive values of factor 1 and negative values of factor 2. There is a high structural level of SI; however, the spontaneous character of the process dominates the strategic character. Therefore, information is used as a support in the decision-making process to a lesser degree than in the first quadrant. The companies found in this quadrant have a good structural level of SI, taking into account information in their decision-making processes, but need to make progress in the strategic orientation of the SI activity.

The third quadrant consists of negative values of factors 1 and 2. This indicates lower structural levels of SI, and in this quadrant the spontaneous character of the process dominates the strategic character of SI. The companies found in this quadrant use information as a support in the decision-making process, but they organize and register this less than do companies in the first two quadrants. The corporate character of SI also has less importance to companies located in this quadrant.

The fourth quadrant consists of negative values of factor 1 and positive values of factor 2. Although this quadrant shows a structural level of SI activities that is lower than in the first
two quadrants, its processes of SI do have a strategic character. The companies found in this quadrant use information as a support in the decision-making process to a relatively low degree, and the corporate character of SI is relatively unimportant. On the other hand, the importance given to the organization and registration of information can be seen in the more strategic, rather than spontaneous, characteristics of their SI processes.

The second hypothesis of the current study is that when evaluating the levels of structure of the processes of SI, it is possible to characterize the types of groups of companies within a larger group. To create the typology that would allow this, we performed cluster analysis to organize the relevant data into significant structures. The groups were formed by the significant differences between the means from the companies in the group and the means from the sampled companies. Five groups of companies were identified (see Appendix 3). In addition, to verify the behavior of the factors in the groups of companies, we conducted analysis of variance (see Appendix 5), which indicates there are significant differences (p < 0.05) between groups in factor 1 (strategic character) and factor 2 (structural integrity), except between G2 - G4 in factor 1 and between G1 - G2 and G2-G4 in factor 2 (p > 0.05). Such results support the cluster analysis and confirm H2, i.e., the analysis of structure enables the collective assessment of firms and the definition of the SI typology.

|        | G1  | G2  | G3  | G4  | G5  | Total |
|--------|-----|-----|-----|-----|-----|-------|
| Factor 1 | 3.814 | 3.040ª | 4.457 | 2.663ª | 1.857 | 3.229 |
| Factor 2 | 3.321ᵇ | 3.100ᵇ | 4.285 | 2.484ᶜ | 1.476 | 2.947 |

|       | G1  | G2  | G3  | G4  | G5  | Total |
|-------|-----|-----|-----|-----|-----|-------|
|        |     |     |     |     |     |       |

a, b, c = Significance level p > 0.05
Source: Prepared by the authors

- **Group 1**

This group is composed by fourteen companies - 17, 41, 11, 30, 34, 35, 8, 37, 23, 42, 3, 15, 19 and 31. The results indicate a significant difference between the means of the questions from this group and the general means of the sampled companies (Appendix 4, Table 4). In these companies, the structural level of SI has a strategic character. There is an organized effort, managed by a specific person or department, that is dedicated to the structuring of information within the organization. This person or department searches for information proactively, defines the information sources according to the themes of the company’s current strategic interests, and consults information sources in a systematic manner. The characteristics that emerge in this group are the collective and systematic nature of the SI process.
• **Group 2**

This group is composed by the companies 47, 20, 39, 6 and 33. The results indicate a significant difference between the means of the questions from this group and the general means of the sampled companies (Appendix 4, Table 5). These companies are characterized by a low level of orientation in their SI processes. In their case, the process of searching for information is not organized by the corporation. Nobody within the organization is designated to carry out such processes. Outside information is searched for when individuals in the corporation deem such a search necessary. However, these companies have a broad understanding of the capabilities of their channels of execution and take this into account in their decision-making processes. The characteristics that emerge in this group are the individual and spontaneous nature of the SI process.

• **Group 3**

This group is composed by the companies 7, 12, 5, 9, 36, 40 and 44. The results indicate a significant difference between the means of the questions from this group and the general means of the sampled companies (Appendix 4, Table 6). This group is characterized by the highest level of structured SI in the sample population. In these companies, the structuring of information has a strategic character, and its operational character is very deliberate. The information is organized, and adequate information search systems are in place. The strategic character of SI in this group is illustrated by its organizations level of SI and by the employment of specialists dedicated to information management. These specialists make use of information networks to gather relevant information. The companies in this group are able to make use of data gathered through SI processes in the execution of their strategies. In addition, these companies believe that the information acquired through SI processes also stimulates the creation of knowledge and innovation within their organizations. At the operational level in these companies, management acts on the basis of the acquired information, and this information is distributed to involved workers at both the management and non-management levels. These companies have internal departments that manage information from the first stages of the information search to its application via software and other specialized tools. The characteristic that emerges in this group is that SI is a corporate, strategic, systematized, and collective process.
• **Group 4**

This group is composed by the companies 26, 46, 27, 16, 22, 45, 32, 18, 10, 29 and 38. The results indicate a significant difference between the means of the questions from this group and the general means of the sampled companies (Appendix 4, Table 7). This group is characterized by a low level of SI, where the flow of information is neither systematized nor determined. At the strategic level, there is a lack of specialists within the organization dedicated to the analysis of information. At the operational level, these companies do not distribute relevant information among involved workers. They also lack a system by which to obtain and retain information. The characteristic that emerges in this group is that they have a spontaneous and relatively unstructured SI process.

• **Group 5**

This group is composed by the companies 24, 13, 28, 25, 4, 14 and 43. The results indicate a significant difference between the means of the questions from this group and the general means of the sampled companies (Appendix 4, Table 8). This group is characterized by having the lowest level of structure in their SI processes. At the strategic level, there is a lack of specialists within the organization dedicated to the analysis of information. No information is pursued in a consistent manner. No use is made of existing networks to gather information, and these companies therefore do not consider information to promote knowledge and innovation. At the operational level, these companies have very little understanding of the capabilities of their channels of execution and do not take this into account in their decision-making process. Their executives do express the belief that information is not distributed among involved workers, and they comment that they do not have a systematized process of information management. They do occasionally use the internet as a source of information. In this group, it is not easy for individuals to consult information within their own companies, which may be due to the lack of a system of registration, a lack of planning, or limited access to information software. This group is characterized by a low structural level of SI processes and a lack of systematization.

Furthermore, it is interesting to note there is coherence between the formed groups and the distribution of the individual companies in the two factors.
5 DISCUSSION

In terms of SI, both in the analysis of individual companies and in the typology of the groups, important differences can be observed among the participating companies. Some show advanced development in their SI processes, whereas others are still in a very early stage of their use. Nevertheless, the result of the correlation analysis among strategic character (D1) and Structural integrity of the SI process (D2) was 0.718 (p < 0.001), which indicates that H1 is supported. Such findings show that the strategic character of the SI process is related to its structural integrity. The literature on SI asserts that the more systematic the function, the more formalized the function will be (COMAI, 2004). This study goes further and reveals that the more solid and organized the structure of the process of SI is, the greater will be the potential of strategic activity.

By assessing the structural integrity of the SI process, it was possible to characterize the typology of groups of companies within a larger group. The analysis of variance (Table 9) indicates there are significant differences between groups in terms of strategic character and structural integrity of the SI process, a finding that supports the cluster analysis and confirms H2. The assessment of the structural integrity of the SI process enables the collective
assessment of firms and the definition of the SI typology for the studied group. The results of our study enable us to extrapolate the analysis of the typology of groups from certain attributes already identified in the literature as attitude, gathering, use, and location (WRIGHT et al., 2002). We could extend the analyses to define typology based on the strategic character within the parameters of a conceptual scale for the SI process. Moreover, it is clear that the group as a whole, because of the high level of development observed in some of the companies, has room for the endogenous development of an SI culture, which is possible thanks to a collective assessment and a definition of a typology of groups.

In general terms, other aspects emerge and should be highlighted. The size of the company did not determine the level of SI use in this study. In the companies of Group Three, the best positioned regarding level of SI use, three out of seven companies have annual revenues of less than 20 million Euros and employ fewer than 100 employees. Only two companies in that group have more than 500 employees. This lack of influence of size may be due to characteristics endemic to the surveyed companies and their current efforts to develop a culture of appreciation for knowledge and innovation. However, it still is necessary to further investigate the role of size, because other studies have indicated that smaller companies have more difficulty implementing SI processes than do larger ones (MCKENNA, 1996; DANET, 2006).

With regard to the processes of SI, the results are generally positive (Appendix 2). The image that has arisen from the group of companies involved is that the higher means show that information is fundamental to the creation of knowledge (3,841) and that the decisions take into consideration the companies’ competence to execute them (3,864). On the other hand, those companies with the lowest means make little use of intelligence software to search for information. Even for these companies, however, the search for information is not an individual process realized by a particular person, but a group effort. This is a positive indication for future SI development, given that SI is much more the product of a culture of corporate information and projects than the result of individual initiatives.

6 CONCLUSION

One of the principal characteristics of all companies, regardless of their product or size, is their concern with developing competitiveness within a context that has no frontiers. It is therefore imperative that these organizations develop an understanding of the environments in which they exist, since management practices must be based on an expanding vision of the current phenomena that determine the challenges to information and innovation. In other
words, management must take multidisciplinary action, developing operational flexibility as well as speed and precision in information-gathering. In this context, SI becomes an important conceptual and methodological resource for processing information. In fact, fundamental and profound knowledge of the organization about itself and about its environment is essential to the integration of intelligence into the strategic levels of the organization. If this is true for individual organizations, it is also true for groups of companies. In this case the vision is collective and refers to the concepts of collective intelligence.

Thus, it is important to consider that the convergence of representations of individual actors and collective actors contributes to the development of a group identity, which leads to greater cohesion and reliance. That is, the collective dimension of intelligence is intermittently built by meeting identity and project with the added value of knowledge and innovation (BOURRET, 2008).

Therefore it is important to consider as a perspective for new studies, the relationship between the levels of structure in SI and innovation. This study found out elements about the relationship that need to be more explored. In the statistical means (Appendix 2), the highest score refers to the use of the results of SI processes to promote innovation (3,659) and the knowledge creation process (3,841). The results also show that these two means are higher than the mean of the question on the use of results of the SI processes to execute strategies (3,545). The relation between SI and innovation can also be seen in the characteristics of Group Three, which consists of the companies with the highest structural levels of SI. In this group, the information obtained through companies’ environments stimulates the creation of knowledge (4.7) and innovation (4.7). Furthermore, current research shows that from the viewpoint of the evolution of practices, theories, and policies of innovation, five crucial factors can be identified for the management of its processes: (1) management of the interfaces; (2) systems of (de-)construction and organization (innovation); (3) the existence of a platform for experimenting and learning; (4) the infrastructure of SI; and (5) the articulation of the stimulus for demand, strategy, and vision (SMITS; KUHLMANN, 2004). SI can be an important conceptual and methodological asset for innovation processes, from the initial phase to the evaluation of the feasibility of the product, in either the individual or group of companies.

REFERENCES

BARTOLI, J. A.; LE MOIGNE, J. L. Organisation intelligente et système d’information stratégique. Paris: Econômica, 1996.
Besson, B.; Possin, J. C. Du renseignement à l'intelligence économique. Paris: Dunod, 1997.

Brody, R. Issues in defining competitive intelligence: an exploration. *Journal of Competitive Intelligence and Management*, v. 4, n. 3, p. 3-16, 2008.

Churchill Júnior, G. A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, v. 16, n. 1, p. 64-73, 1979.

Comai, A. Discover hidden corporate intelligence needs by looking at environmental and organizational contingencies. *Frontiers of E-Business Research*, p. 397-413, 2004.

Cobb, P. Competitive intelligence through data mining. *Journal of Competitive Intelligence and Management*, v. 1, n. 3, p. 80-89, 2003.

Danet, D. Intelligence économique et création d’entreprise. Centre de Recherche, École Spéciale Militaire de Saint-Cyr, *Working paper*, v. 1, p. 1-46, 2006.

Dou, H. Veille Technologique et compétitivité, l’intelligence économique au service du développement industriel. Paris: Dunod, 1995.

Drucker, P. Le knowledge management. *Harvard Business Review*, Paris, Edition d’Organisations, 1999.

Fachinelli, A. C. *et al.* The strategic intelligence and knowledge creation: a Brazilian case. *Journal of IMS Group*, v. 7, p. 1-12, 2010.

Folinas, D. A conceptual framework for business intelligence based on activities monitoring systems. *International Journal of Intelligent Enterprise*, v. 1, n. 1, p. 65–80, 2007.

Fuld, L. The new competitor intelligence: the complete resource for finding, analyzing, and using information about your competitors. New York: John Wiley and Sons, 1995.

Goldhaber, J. M. Comunicación organizacional. México: Editorial Diana, 1991.

Guilhon, A. Les approches conceptuelles de l’intelligence économique dans les PME. In: ______. (Ed.). *L’Intelligence économique dans la PME*. Paris: L’Harmattan, 2004. p. 21-42.

Jakobiak, F. L’Intelligence économique. Paris: Édition d’Organisation, 2004.

Jaworski, B. J.; MacInnis, D. J.; Kohli, A. K. Generating competitive intelligence in organizations. *Journal of Market-Focused Management*, n. 5, p. 279-307, 2002.

Kahaner, L. Competitive intelligence: how to gather, analyze, and use information to move your business to the top. New York: Simon & Schuster, 1996.

Kerr, C. I. V. *et al.* A conceptual model for technology intelligence. *International Journal of Technology Intelligence and Planning*, v. 2, n. 1, p. 73-93, 2006.
LEVET, J. L. *L’intelligence économique, mode de pensée, mode d’action*. Paris: Economica, 2001.

MARTRE, H. *Intelligence économique et stratégie des entreprises*. Paris: Commissariat Général du Plan, 1994.

MCKENNA, S. D. *The darker side of the entrepreneur*. *Leadership & Organizational Development Journal*, v. 17, n. 5, p. 41, 1996.

MILLER, S. *Competitive intelligence: an overview*. Alexandria: Society of Competitive Intelligence Professionals, 2001.

MOATTI, P. *Les nouvelles logiques de l’entreprise*. *Les Cahiers Français, La documentation Française*, n. 309, p. 3-8, 2002.

PORTER, M. *Competitive strategy*. New York: Free Press, 1980.

**APPENDIX 1**

Mark with an X your level of agreement or disagreement with each of the statements below, always considering the situation within your company.

**Response Categories:**

1= Strongly disagree
2= Disagree somewhat
3= Do not agree nor disagree
4= Agree somewhat
5= Strongly agree

| Questions                                                                 | Disagree | Agree |
|---------------------------------------------------------------------------|----------|-------|
| 1. In our company, we have tools (software) for systematic information searches on the internet. | 1 2 3 4 5 |       |
| 2. In our company, we have a formal structure (sector, software, responsible person, etc.) to systematize information search, analysis, and dissemination. | 1 2 3 4 5 |       |
| 3. In our company, most information flows are mapped in the organization sectors according to pre-determined objectives. | 1 2 3 4 5 |       |
| 4. In our company, there is a group of specialists from different areas who analyze information from our business environment. | 1 2 3 4 5 |       |
| 5. In our company, we have a system to register information from our business environment. | 1 2 3 4 5 |       |
| 6. In our company, we have an organized information-source system that we consult systematically and periodically. | 1 2 3 4 5 |       |
| 7. In our company, information is always analyzed by experts on the subject before being used in the decision-making process. | 1 2 3 4 5 |       |
| 8. In our company, we disseminate strategic information to employees from sectors that are related to this information. | 1 2 3 4 5 |       |
| 9. In our company, we define sources to be consulted based on strategic interest themes. | 1 2 3 4 5 |       |
| Questions                                                                                                                                                                                                 | Disagree | Agree |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------|
| 10. In our company, decisions are based on the results of the information search and treatment process.                                                                                               | 1 2 3 4 5|       |
| 11. In our company, information from our business environment is used to foment innovation.                                                                                                           | 1 2 3 4 5|       |
| 12. In our company, information collection and treatment allow us to learn from our business environment.                                                                                             | 1 2 3 4 5|       |
| 13. In our company, information from our business environment is fundamental to the knowledge creation process.                                                                                       | 1 2 3 4 5|       |
| 14. In our company, the analysis process results in a decision that takes into consideration the competencies of the people responsible for its execution.                                                 | 1 2 3 4 5|       |
| 15. In our company, managers are guided to act according to information obtained from a systematic process of collecting and treating information.                                                      | 1 2 3 4 5|       |
| 16. In our company, we systematically look for information pertaining to strategic interest themes.                                                                                                      | 1 2 3 4 5|       |
| 17. In our company, the information search process is systematic and the responsibility of at least one person.                                                                                         | 1 2 3 4 5|       |
| 18. In our company, we have survey or intelligence software to monitor our interest environments                                                                                                       | 1 2 3 4 5|       |
| 19. In our company, we look for strategic information by means of a relationship network we have constructed for this purpose.                                                                       | 1 2 3 4 5|       |
| 20. In our company, we have a database for all documentation that refers to our environment and to the agents involved.                                                                                | 1 2 3 4 5|       |
| 21. In our company, it is easy to consult the archived materials that refer to our environment and to the agents involved                                                                          | 1 2 3 4 5|       |
| 22. In our company, we have organized a database for the information that comes from our sales organization, upper management, suppliers, etc.                                                       | 1 2 3 4 5|       |
| 23. In our company, the information search is an individual process, done by any person in need of information on an individual basis.                                                               | 1 2 3 4 5|       |
| 24. In our company, the flow of information is spontaneous and is not strictly guided by specific objectives.                                                                                         | 1 2 3 4 5|       |
| 25. In our company, information search is a collective process of constant environmental observation.                                                                                                 | 1 2 3 4 5|       |
| 26. In our company, information search is a process conducted by a group of experts focused on strategic interest themes.                                                                                | 1 2 3 4 5|       |
| 27. In our company, we primarily seek information that is relevant to the execution of our strategies.                                                                                                 | 1 2 3 4 5|       |
| 28. In our company, the search for information is a planned activity resulting from the directives from upper management.                                                                          | 1 2 3 4 5|       |

Company: ____________________________________________
Sector: ____________________________________________
Company foundation year: _________

Annual turnover (in Euros):
- ( ) More than 300 Million
- ( ) From 200 to 300 Million
- ( ) From 100 to 200 Million
- ( ) From 50 to 100 Million
- ( ) From 40 to 50 Million
- ( ) From 30 to 40 Million
- ( ) From 20 to 30 Million
- ( ) Less than 20 Million

Number of employees:
- ( ) 1 to 9
- ( ) 10 to 49
- ( ) 50 to 99
- ( ) More than 100
- ( ) More than 500
Target market (market distribution of sales in %):
( ) Regional
( ) National
( ) International

Data of person interviewed

Position: __________________________ Years in the Company: __________________________

Education completed:
( ) None
( ) Primary education
( ) High school education
( ) Post high school professional education
( ) College degree

APPENDIX 2 - ITEM-TOTAL STATISTICS

| Active Variables                                                                 | effective | mean  | standard deviation |
|----------------------------------------------------------------------------------|-----------|-------|--------------------|
| A formal structure (sector, software, responsible person, etc.) is in place to  | 44        | 2.864 | 1.455              |
| systematize information search, analysis, and dissemination.                      |           |       |                    |
| The organization has a system to register information from the business environment.| 44        | 3.023 | 1.357              |
| The organization has an organized information-source system that is consulted   | 44        | 3.000 | 1.128              |
| systematically and periodically.                                                 |           |       |                    |
| Information is always analyzed by experts on the subject before being used in    | 44        | 3.250 | 1.047              |
| the decision-making process.                                                      |           |       |                    |
| The organization disseminates strategic information to employees from sectors    | 44        | 3.545 | 1.054              |
| related to this information.                                                      |           |       |                    |
| Decisions are based on the results of the information seeking and treatment       | 44        | 3.159 | 0.903              |
| process.                                                                          |           |       |                    |
| Information from the business environment is used to foment innovation.          | 44        | 3.659 | 0.851              |
| Information collection and treatment are informed by the business environment.    | 44        | 3.409 | 1.030              |
| Information from the business environment is fundamental to the knowledge creation| 44        | 3.841 | 0.952              |
| process.                                                                          |           |       |                    |
| The analytical process results in a decision that considers the competencies of   | 44        | 3.864 | 0.919              |
| the people responsible for its execution.                                         |           |       |                    |
| The organization systematically searches for information on its strategic interest| 44        | 3.500 | 1.215              |
| themes.                                                                          |           |       |                    |
| Information seeking is systematic, and at least one person is responsible for the | 44        | 3.068 | 1.528              |
| process.                                                                          |           |       |                    |
| The organization has survey or intelligence software to monitor its interest      | 44        | 2.705 | 1.455              |
| environments.                                                                     |           |       |                    |
The organization seeks strategic information by means of a relationship network constructed for this purpose.  

The organization has a system to register information from the business environment.

It is easy to consult the archived materials that refer to the environment and to the agents involved.

The organization has a database for the information that comes from its sales organization, upper management, suppliers, etc.

Information search is an individual process done by any person in need of information on an individual basis.

The flow of information is spontaneous and is not strictly guided by specific objectives.

The information search is a collective process of constant environmental observation.

The information search is a process conducted by a group of experts on strategic interest themes.

The organization primarily seeks information relevant to the execution of the strategies.

The search for information is a planned activity resulting from the directives from upper management.

| Illustrative variables | Effective | Moyenne | Ecart-type |
|------------------------|-----------|---------|------------|
| Years in business      | 42        | 4.000   | 1.363      |
| Revenue                | 43        | 6.023   | 2.298      |
| Employees              | 44        | 3.568   | 1.009      |
| Years in the company   | 37        | 3.865   | 1.773      |
| Education              | 44        | 4.864   | 0.457      |
APPENDIX 3

Classification hiérarchique directe

Figure 4 - Dendrogram
APPENDIX 4 - GROUPS OF COMPANIES

Table 5 – Group 1 Company Means

| Dimension/questions | Means - group | Means - sample | Probability |
|---------------------|--------------|---------------|-------------|
| D1-P17. In our company, the information search process is systematic and the responsibility of at least one person. | 4.0          | 3.0           | 0.002       |
| D1-P16. In our company, we systematically look for information pertaining to strategic interest themes. | 4.2          | 3.5           | 0.002       |
| D1-P26. In our company, information search is a process conducted by a group of experts focused on strategic interest themes. | 3.6          | 2.8           | 0.003       |
| D1-P06. In our company, we have an organized information-source system that we consult systematically and periodically. | 3.6          | 3.0           | 0.005       |
| D1-P09. In our company, we define sources to be consulted based on strategic interest themes. | 3.8          | 3.2           | 0.008       |
| D1-P04. In our company, there is a group of specialists from different areas who analyze information from our business environment. | 3.6          | 3.0           | 0.009       |

Source: Prepared by the authors

Table 6 – Group 2 Company Means

| Dimension/questions | Means - group | Means - sample | Probability |
|---------------------|--------------|---------------|-------------|
| D4-P14. In our company, the analysis process results in a decision that considers competences from people responsible for it execution. | 5.0          | 3.8           | 0.002       |
| D5-P23. In our company, the information search is an individual process, done by any person in need of information on an individual basis. | 4.2          | 2.6           | 0.002       |

Source: Prepared by the authors

Table 7 – Group 3 Company Means

| Dimension/questions | Means - group | Means - sample | Probability |
|---------------------|--------------|---------------|-------------|
| D1-P04. In our company, there is a group of specialists from different areas who analyze information from our business environment. | 4.5          | 3.0           | 0.000       |
| D3-P03. In our company, the information flows are mapped mostly in the organization sectors, according to pre-determined objectives. | 4.5          | 3.3           | 0.000       |
| D3-P02. In our company, we have a formal structure (sector, software, responsible person, etc.) to systematize information search, analysis, and dissemination. | 4.7          | 2.8           | 0.000       |
| D2-P05. In our company, we have a system to register information from our business environment. | 4.7          | 3.02          | 0.000       |
| D1-P11. In our company, information from our business environment is used to foment innovation. | 4.7          | 3.6           | 0.000       |
| D2-P20. In our company we have a data base for all documentation that refers to our environment and to the agents involved. | 4.5          | 3.0           | 0.000       |
| D1-P19. In our company, we look for strategic information by means of a relationship network we have constructed to do so. | 4.4          | 2.9           | 0.000       |
| D1-P07. In our company, information we have are always analyzed by experts on the subject before they are used in the decision-making process. | 4.4          | 3.2           | 0.001       |
| D4-P15. In our company, managers are guided to act according to information from a systematic process of collecting and treating information. | 4.2          | 3.1           | 0.001       |
| D4-P10. In our company, decisions are based on the result of the information seek and treatment process. | 4.1          | 3.1           | 0.001       |
| D1-P17. In our company, information seek is systematic on the responsibility of at least one person. | 4.7          | 3.0           | 0.001       |
| D1-P27. In our company, we seek primarily relevant information to enable us the execution of our strategies. | 4.5          | 3.5           | 0.001       |
In our company, we have an organized information-source system that we consult systematically and periodically.  
In our company, we have tools (software) for systematic information search on the internet.  
In our company is easy to consult the archived materials which refer to our environment and to the agents involved.  
In our company, we systematically look for information on the strategic interest themes  
In our company, information collect and treatment allow us to learn from our business environment.  
In our company, we have survey or intelligence software to monitor our interest environments  
In our company, we spread out strategic information to employees from sectors that are related to this information.  
In our company, information from our business environment is fundamental for knowledge creation process.  
In our company we have organized a data base for the information that comes from our sales organization, upper management, suppliers, etc.  
In our company, we define sources to be consulted based on the strategic interest themes that serve for information.  
In our company, information search is a process conducted by a group of experts on strategic interest themes.  
In our company, the search for information is a planned activity resulting from the directives from the upper management.  
In our company, the flow of information is spontaneous and is not strictly guided by specific objectives.  
In our company, information we have are always analyzed by experts on the subject before they are used in the decision-making process.  
In our company, we spread out strategic information to employees from sectors that are related to this information.  
In our company, there is a group of specialists from different areas who analyze information from our business environment.  
In our company, the information flows are mapped mostly in the organization sectors, according to pre-determined objectives.  
In our company, we have a system to register information from our business environment.  
In our company, we have a formal structure (sector, software, responsible person, etc.) to systematize information search, analysis, and dissemination  
In our company, information collect and treatment allow us to learn from our business environment.

Source: Prepared by the authors

| Dimension/questions                                                                 | Means - group | Means - sample | Probability |
|-----------------------------------------------------------------------------------|---------------|----------------|-------------|
| D5. P24. In our company, the flow of information is spontaneous and is not strictly guided by specific objectives. | 3.8           | 2.7            | 0.000       |
| D1-P07. In our company, information we have are always analyzed by experts on the subject before they are used in the decision-making process. | 2.5           | 3.2            | 0.005       |
| D4-P08. In our company, we spread out strategic information to employees from sectors that are related to this information. | 2.8           | 3.5            | 0.005       |
| D1-P04. In our company, there is a group of specialists from different areas who analyze information from our business environment. | 2.1           | 3.0            | 0.003       |
| D3-P03. In our company, the information flows are mapped mostly in the organization sectors, according to pre-determined objectives. | 2.6           | 3.3            | 0.003       |
| D2-P05. In our company, we have a system to register information from our business environment. | 2.0           | 3.0            | 0.002       |
| D3-P02. In our company, we have a formal structure (sector, software, responsible person, etc.) to systematize information search, analysis, and dissemination | 1.6           | 2.8            | 0.001       |
| D3-P12. In our company, information collect and treatment allow us to learn from our business environment. | 2.4           | 3.4            | 0.000       |

Source: Prepared by the authors
Table 9 – Group 5 Company Means

| Dimension/questions                                                                 | Means - group | Means- sample | Probability |
|-------------------------------------------------------------------------------------|---------------|---------------|-------------|
| D3-P01. In our company, we have tools (software) for systematic information search on the internet. | 2.7           | 3.6           | 0.010       |
| D1-P17. In our company, information seek is systematic on the responsibility of at least one person. | 1.7           | 3.0           | 0.006       |
| D3-P02. In our company, we have a formal structure (sector, software, responsible person, etc.) to systematize information search, analysis, and dissemination. | 1.5           | 2.8           | 0.006       |
| D1-P04. In our company, there is a group of specialists from different areas who analyze information from our business environment. | 1.8           | 3.0           | 0.002       |
| D2-P21. In our company is easy to consult the archived materials which refer to our environment and to the agents involved. | 1.7           | 3.0           | 0.002       |
| D1-P19. In our company, we look for strategic information by means of a relationship network we have constructed to do so. | 1.7           | 2.9           | 0.002       |
| D1-P07. In our company, information we have are always analyzed by experts on the subject before they are used in the decision-making process. | 2.1           | 3.2           | 0.001       |
| D4-P14. In our company, the analysis process results in a decision that considers competences from people responsible for it execution. | 2.8           | 3.8           | 0.001       |
| D2-P28. In our company, the search for information is a planned activity resulting from the directives from the upper management. | 1.5           | 2.9           | 0.001       |
| D1-P16. In our company, we systematically look for information on the strategic interest themes. | 2.1           | 3.5           | 0.001       |
| D5-P25. In our company, information search is a collective process of constant environment observation. | 1.8           | 3.5           | 0.000       |
| D2-P22. In our company we have organized a data base for the information that comes from our sales organization, upper management, suppliers, etc. | 1.5           | 2.9           | 0.000       |
| D2-P18. In our company, we have survey or intelligence software to monitor our interest environments | 1.0           | 2.7           | 0.000       |
| D2-P05. In our company, we have a system to register information from our business environment. | 1.4           | 3.0           | 0.000       |
| D1-P13. In our company, information from our business environment is fundamental for knowledge creation process. | 2.7           | 3.8           | 0.000       |
| D4-P08. In our company, we spread out strategic information to employees from sectors that are related to this information. | 2.2           | 3.5           | 0.000       |
| D2-P20. In our company we have a data base for all documentation that refers to our environment and to the agents involved. | 1.5           | 3.0           | 0.000       |
| D4-P10. In our company, decisions are based on the result of the information seek and treatment process. | 2.0           | 3.1           | 0.000       |
| D4-P15. In our company, managers are guided to act according to information from a systematic process of collecting and treating information. | 1.8           | 3.1           | 0.000       |
| D1-P06. In our company, we have an organized information-source system that we consult systematically and periodically. | 1.4           | 3.0           | 0.000       |
| D1-P26. In our company, information search is a process conducted by a group of experts on strategic interest themes. | 1.1           | 2.8           | 0.000       |
| D1-P09. In our company, we define sources to be consulted based on the strategic interest themes that serve for information. | 1.5           | 3.2           | 0.000       |
| D1-P11. In our company, information from our business environment is used to foment innovation. | 2.4           | 3.6           | 0.000       |
| D1-P27. In our company, we seek primarily relevant information to enable us the execution of our strategies. | 2.1           | 3.5           | 0.000       |

Source: Prepared by the authors
## APPENDIX 5 - ANALYSIS OF VARIANCE

| Dependent Variable | (I) grup | (J) grup | Mean Difference (I-J) | Standart Error | Sig. |
|--------------------|----------|----------|-----------------------|----------------|------|
| factor 1           | 1,00     | 2,00     | .77429*               | .21737         | .008 |
|                    | 3,00     | 4,00     | 1,15065*              | .16810         | .000 |
|                    | 5,00     |          | 1,95714*              | .19314         | .000 |
|                    | 2,00     | 3,00     | -.64286*              | .19314         | .015 |
|                    | 4,00     |          | 1,15065*              | .16810         | .000 |
|                    | 5,00     |          | 1,95714*              | .19314         | .000 |
|                    | 3,00     | 4,00     | .37636                | .22503         | .462 |
|                    | 5,00     |          | 1,18286*              | .24430         | .000 |
|                    | 4,00     |          | -.77429*              | .21737         | .008 |
|                    | 5,00     |          | 1,95714*              | .19314         | .000 |
| Dimension 2        | 1,00     | 2,00     | .64286*               | .19314         | .015 |
|                    | 3,00     | 4,00     | 1,14714*              | .24430         | .000 |
|                    | 5,00     |          | 2,60000*              | .22301         | .000 |
|                    | 2,00     | 3,00     | -.1,00                | .19314         | .000 |
|                    | 4,00     |          | -.1,18571*            | .20172         | .000 |
|                    | 5,00     |          | 1,18571*              | .20172         | .002 |
|                    | 3,00     | 4,00     | 1,79351*              | .20172         | .000 |
|                    | 5,00     |          | 2,80952               | .36295         | .000 |
| Dimension 1        | 1,00     | 2,00     | .22143                | .35376         | .970 |
|                    | 3,00     | 4,00     | .83658*               | .27358         | .031 |
|                    | 5,00     |          | 1,84524*              | .31432         | .000 |
|                    | 2,00     | 3,00     | -.2,2143              | .35376         | .970 |
|                    | 4,00     |          | .61515                | .36623         | .458 |
|                    | 5,00     |          | 1,62381*              | .39759         | .002 |
|                    | 3,00     | 4,00     | .96429*               | .31432         | .030 |
|                    | 5,00     |          | 1,80087*              | .32830         | .000 |
|                    | 4,00     | 5,00     | 2,80952               | .36295         | .000 |
|                    | 5,00     |          | 1,00866*              | .32830         | .030 |
| factor 2           | 1,00     | 2,00     | .83658*               | .27358         | .031 |
|                    | 3,00     | 4,00     | .61515                | .36623         | .458 |
|                    | 5,00     |          | 1,00866*              | .32830         | .030 |
|                    | 2,00     | 3,00     | -.1,80087             | .32830         | .000 |
|                    | 4,00     |          | 1,80087*              | .32830         | .000 |
|                    | 5,00     |          | 1,00866*              | .32830         | .030 |

Source: Prepared by the authors