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## **"Mobilizing company members' full innovative potential"<sup>1</sup>**

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### **Abstract:**

Most of the literature on innovation management highlights the fundamental role played by people in the innovation process and the need to fully develop the creative and innovative potential of organizations' members. This paper offers the result of extensive research carried out among some of the most innovative companies in the Basque Country, a highly innovative region located in the north of Spain. It draws interesting conclusions about how these innovative companies combine strong leadership, human resource practices and an organizational culture that enhances innovation capabilities among the company's employees. More specifically, it answers questions such as: are human resources policies, leadership and innovation culture implemented equally in Basque innovative companies? Do companies make the same effort in deploying these elements or routines and

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practices related to them? Can we see a pattern in the use of these elements among innovative firms?

**Keywords:** Innovation Management; Leadership; Human Resource Practices; Organizational Culture; Innovative companies.

## **1 Introduction**

One of the main challenges that companies face when dealing with innovation is how to *mobilize the full innovative and creative potential of its members*. Research suggests that organizations that manage to involve a large proportion of their staff in innovation can make significant gains (Amar, 2001; Jager, et. al., 2004; Jong & Den Hartog, 2007; Dobni, 2008). In this sense, some authors suggest that the organization's success in implementing an innovation strategy and reaching the innovation targets depends upon its employees' commitment (Knox, 2002). Organizations create the framework and environment where members feel motivated and committed to knowledge-sharing and innovating. Innovation on a sustained basis can be achieved by ensuring that a company's members are receptive to, and have the necessary skills and motivation to support change (Shipton, et. al., 2006).

In the first section of the paper we describe the fundamental role that strong leadership, human resources policies and a robust innovation culture can play in mobilizing full innovative potential. The three variables considered can help create the right environment to innovate and foster company personnel's commitment to innovating, therefore increasing the firm's innovation capability. In any case, in innovation management there is no simple recipe to follow, as the contribution made by the many elements enhancing an organization's innovation capability depends on how well they interact and reinforce each other. In this sense, we also

present the elements that, according to the literature, integrate an innovation management system.

Secondly, we offer the results of a field study carried out among 22 of the most innovative Basque industrial companies in the region. The Basque Country has one of the most advanced Regional Innovation Systems in Spain, ranking 55th among 203 European regions (European Commission, 2007) and is considered a successful experience in Europe (Fernández Pérez & León Rodríguez, 2006). The research question we are trying to address is how these innovative companies combine leadership, human resources policies and a robust innovation culture within the greater framework of their innovation management systems. More specifically, we will try to answer questions such as: are human resources policies, leadership and innovation culture implemented equally in innovative companies? Do companies make the same effort in deploying these elements or routines and practices related to them? Can we see a pattern in the use of these elements among innovative firms? The final section provides the main conclusions drawn from the study and reveals interesting implications.

## **2. Leadership, human resources practices, and organizational culture: Key elements in the mobilization of company members' full innovative potential**

This paper addresses the issue of *how organizations create the necessary incentives and appropriate environment for people to develop their creativity and commit to innovation*. It is argued that that strong leadership, specifically designed human resources policies and a robust innovation culture can play a fundamental role.

Following Jung, et. al. (2003), we argue that apart from being guided and motivated by the leader's behaviour and organizational culture, employees'

behaviours also are a function of human resources practices. In their work Jung, et. al. (2003) study the role of transformational leadership in creating and maintaining a work environment that fosters creativity. The authors acknowledge that the behaviours of organizational members take place in a far more complex environment involving many additional factors, such as performance measurement and reward systems. They also admit that personnel's desire to experiment and take risks could also depend on the tightness of the resource and time constraints that they face at work (which in this work has been considered part of human resource practices). Therefore, this work widens the scope and includes the analysis of three elements that impact on employees' behaviour.

On the other hand, the organizational learning theory suggests positive and organic linkages among culture, leadership, human resource practices and the outcome of an organization (Jung & Takeuchi, 2010). The fundamental premise of organizational learning is to facilitate mutual communication and knowledge sharing among individual members within an organization, and a supportive leadership by top managers, a community culture and a performance-based appraisal practices are considered crucial for that (Jung & Takeuchi, 2010).

A considerable body of research has examined the impacts of organizational culture (McLean, 2005; Tesluk, et. al, 1997; Škerlavaj, et. al., 2010; Khazanchi, et. al., 2007; Jassawalla & Sashittal, 2002), top management leadership (Sarros, et. al., 2008; Jung, et. al., 2008; Jung, et. al., 2003; Jung, 2001; Smith, 2002; Shin & Zhou, 2003; Jong & Den Hartog, 2007) and human resource practices (Chen & Huang, 2009; Pérez López, et. al., 2005; Leede & Looise, 2005; Madsen & Ulhoi, 2005; Shipton, et. al., 2005; Som, 2006; Katou & Budhwar, 2008) on innovation. Hence, it seems quite clear that organizational culture, top management leadership and human resource practices each play a significant role in the enhancement of company's innovativeness.

On the one hand, *human resources practices*, among other aspects, aim to increase employee incentives to engage in innovation activities (Shipton, et. al., 2006; Rammer, et. al., 2009). Human resource practices are among the most important means by which firms can influence and shape the skills, attitudes, and behaviour of individuals to do their work and thus achieve organizational goals (Collins & Clark, 2003). Experience reported by many innovative companies show that some practices in the field of human resources are essential to build organizations where innovation becomes part of their peoples' DNA. This is the case of companies such as 3M or Google, that demonstrate that one of the keys to innovation success is having motivated people in the right environment. The human resources policies deployed by these companies (personnel recruitment and retaining policies, "15% rule", recognition and reward programs, personnel training programmes, etc.) are crucial to reach this objective (Brand, 1998; Välikangas & Jett, 2006).

Consequently, the bibliography pays a lot of attention to aspects related to human resources policies designed to promote the development of a firm's innovation capability (Lau & Ngo, 2004; Pérez López, et. al., 2005; Leede & Loise, 2005; Madsen & Ulhoi, 2005; Shipton, et. al., 2005; Som, 2006; Katou & Budhwar, 2008).

Laursen and Foss (2003), for example, study how a package of complementary human resource management practices influences innovation performance, using data from 1,900 Danish firms. Lau and Ngo (2004), from a survey of 332 firms in Hong Kong confirmed that organizational culture acted as a mediator between a firm's human resource system and product innovation. They conclude that a human resource system which emphasizes extensive training, performance-based reward and team development is necessary to create an organizational culture that is conducive to product innovation. Shipton, et. al. (2005) on the other hand, in a longitudinal study of 35 manufacturing organizations, confirmed that there is a

combination of sophisticated human resource practices that predict innovation in products and production technology and that a supportive learning climate promotes organizational innovation. Using a regression analysis in a sample of 146 firms, Chen and Huang (2009) conclude that strategic human resource practices relate positively to knowledge management capacity, which in turn has a positive effect on innovation performance. Similarly, López-Cabrales, et. al. (2009) human resource practices are directly associated with innovation if they take into account employees' knowledge.

Therefore, a deliberate and specific human resources management strategy can help a company that aims to create an innovative organization. In innovation management, human resource policies should be considered as a strategic and integrated field contributing to the whole company, and not just as a set of fragmented practices that support certain innovation activities, types or even phases (Leede & Loise, 2005). Adopting complementary human resources management practices has a bigger impact on innovation performance than adopting individual or stand-alone practices (Laursen & Foss, 2003; Laursen, 2002). In fact, when business strategies and human resources policies are developed simultaneously they affect the organization's performance positively, particularly regarding innovation, employee rewards and employee relations (Katou & Budhwar, 2008).

Human resources practices include recruiting the right people to promote innovation within an organization, training on handling innovation challenges, together with reward systems, performance management systems and career development tools that help employees form innovative ideas (Rammer, et. al., 2009).

On the other hand, *leaders* are a powerful source of influence on employee behaviour (Yukl, 2002). Leadership can be defined as the process of influencing

others towards achieving some kind of desired outcome (Jong & Den Hartog, 2007). The challenge for business leaders is to inspire their employees to innovate and to commit to customers by fostering the distinctive behaviours that deliver innovative solutions faster than the competition (Knox, 2002). Therefore, managers must have the ability to stimulate and support the creativity of all the people who work with them, developing a new way of management based on involvement and motivation rather than compliance with rules (Erlicher, 2005).

In the field of leadership and innovation, Jung, et. al. (2003) carry out a study based on 32 Taiwanese companies and they suggest that a direct and positive relationship exists between transformational leadership and organizational innovation. Some years later Jung, et. al. (2008), studied 50 Taiwanese electronics and telecommunications companies, conclude that a positive relationship exists between transformational leadership and organizational innovation. Based on responses to a survey of 1,158 Australian managers Sarros, et. al., (2008) explore the relationship between transformational leadership and climate for organizational innovation and how a competitive, performance-oriented organizational culture mediates this relationship. More recently, Gumusluoglu and Ilsev (2009) proposed a model of the impact of transformational leadership both on followers' creativity at the individual level and on innovation at the organizational level, which was tested on 163 R&D personnel and managers at 43 micro- and small-sized Turkish software development companies. The authors conclude that transformational leadership has important effects on creativity at both the individual and organizational levels. Finally, Makri and Scandura (2010) test two dimensions of strategic leadership (operational and creative) through a sample of 77 high-technology firms. According to them leadership at the top seems to be an important antecedent of a firm's ability to innovate due to impact the CEO has on the development of the organizational vision and the strategies to attain that vision.

In this sense, many other authors highlight the crucial role played by leaders to promote the firm's innovation capability (Smith, 2002; Shin & Zhou, 2003; Jong & Den Hartog, 2007), and some of them focus specifically on leadership practices in new product development projects (Harborne & Johne, 2003; McDonough, 2000). Some works distinguish management from leadership (Harborne & Johne, 2003; Von Stamm, 2003), while others do not, as they consider that these two concepts are not mutually exclusive (Jong & Den Hartog, 2007).

One of the preconditions to enhance the probability of innovation is that the management team has made a conscious decision to make innovation a desirable corporate focus (Brockbank, 1999). Innovation should be a priority for all members and CEOs have to take the lead and put across its importance. If they do so, innovation becomes a way of life and successful growth will take place (Kuczarski, 2003).

In fostering innovation, it is important to rely on a leader who believes in and consistently commits resources to innovation (Kuczarski, 2003) and who communicates an inspiring vision of the innovative organization and its commitment to customers (Knox, 2002). In fact, the range of leader behaviours that enhance employee's innovative behaviour is vast (Jong & Den Hartog, 2007). According to Von Stamm (2003) best-practices in the field of leadership involve demonstrating commitment to innovation (in deeds not only in words), communicating clearly and opportunely, creating a common purpose, inspiring and including, encouraging experimentation and tolerating failure, and connecting with personnel on an emotional level. Conceptually, leaders can affect employee creativity and organizational innovation in different ways (Jung, et. al., 2003): on the one hand, they define and shape the work contexts where employees interact to define goals, problems, and solutions. At the same time, by articulating a vision that emphasizes long term over short-term business outcomes, top managers can



guide workers' individual and joint efforts towards innovative work processes and outcomes.

*Culture* can be understood as the collective habits of minds, hearts and actions, and includes shared myths, rituals, language, ideals, goals and values (Soupata, 2001). It is the arrangement or behaviour pattern adopted by a group as the accepted way of solving problems (Ahmed, 1998). Innovative organizations possess a certain culture that is proactive and market driving (Dobni, 2008), and that becomes a strategic asset (Soupata, 2001). Organizational culture seems to influence the degree to which innovation is stimulated in an organization (Tushman & O'Reilly, 1997; Martins & Terblanche, 2003; Claver, 1998; Škerlavaj, et. al., 2010; Khazanchi, Lewis, & Boyer, 2007; Jassawalla & Sashittal, 2002), and some authors argue that culture is a primary determining factor for innovation as it provides the organization with the necessary ingredients to innovate (Ahmed, 1998).

In this way, Tesluk, et al. (1997) focused on how organizational culture and climate influenced creativity at the individual level, and they defined five dimensions of organizational climate that influence creativity, including goal emphasis, means emphasis, reward orientation, task support, and socioemotional support. On the other hand, Khazanchi, et. al. (2007) carried out a study among manufacturing plants that had recently implemented the same advanced manufacturing technology (the final sample consisted of 110 plants). Their study highlights the need for control and flexibility value profiles, encouraging managers to avoid viewing such values as conflicting, and seeking instead to empower employees and to establish supporting policies and systems. More recently, Škerlavaj, et. al. (2010) used data from 201 Korean companies employing more than 50 people, showing how organizational learning culture has a very strong positive direct effect on innovations as well as moderate positive indirect impact via innovative culture.

The functions of organizational culture are internal integration and coordination. In this way, internal integration is described as socializing new members, creating the organization's boundaries, the feeling of identity among personnel and commitment to the organization (Martins & Terblanche, 2003). The value of a strong culture is that, thanks to deeply-held assumptions and beliefs, the organization can facilitate behaviour according to organizational principles (Ahmed, 1998). The culture offers an overarching frame of reference, helping align employee behaviour with organizational objectives of innovation and meet paradoxical demands for control and flexibility (Jassawalla & Sashittal, 2002). Therefore, innovative traits can be blueprinted and deliberately embedded onto an organization's culture to affect their members' behaviour and actions (Dobni, 2008).

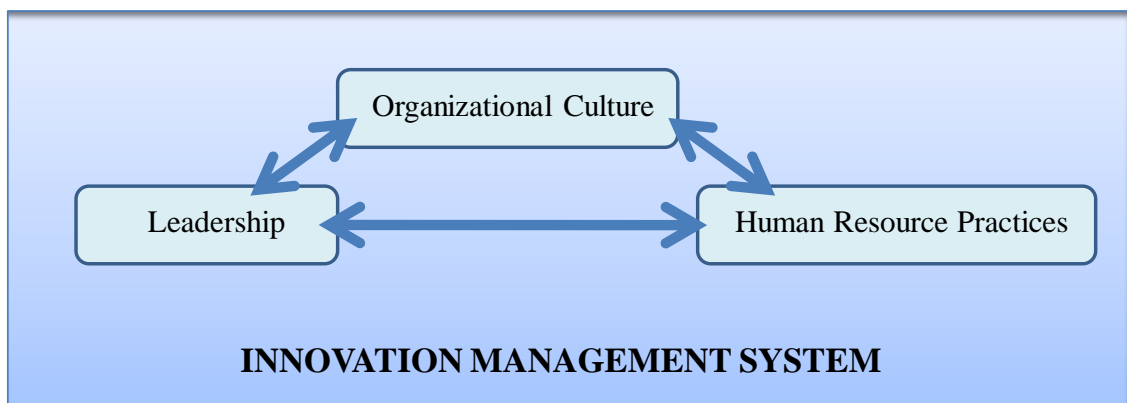
In innovative organizations, company employees understand their business environment; they are able to anticipate customer needs; they share and disseminate knowledge; they think creatively, become adventurous and take managed risks; they learn from failure; they have the ability to adjust to the challenges of the competitive environment; they attribute high levels of integrity, competence, reliability, loyalty and openness to other participants; and they feel empowered, they go above and beyond what is normally expected of them, performing value-creating tasks without realizing (Dobni, 2008).

A culture that supports experimentation and allows for employees to take risks without fear of retribution can contribute to the innovation process Makri and Scandura (2010). It is essential for innovation to have a blame-free culture, where individuals feel free to disagree, where there is constructive conflict, where problems are shared, where there is mutual respect, and where there is trust (Von Stamm, 2003). In this respect, in many innovative organizations the physical setting is designed to facilitate communication within and across organizational teams and among different organizational layers (Brockbank, 1999), so the office

space enables people to make connections, socialize and share knowledge (Albert & Picq, 2004).

Finally, the three elements (human resource practices, leadership and culture) *interact and reinforce* each other, as human resource policies can have a great impact on the creation and consolidation of the desired culture (McLean, 2005; Martins & Terblanche, 2003; Lau & Ngo, 2004), and as business leaders can play an important role in the creation of the right culture in which innovation can thrive (Ahmed, 1998; Knox, 2002; Harborne & Johne, 2003). Leaders become a kind of cultural role models in charge of perpetuating the original values and culture by their day to day actions. So leaders play a role in creating positive and supportive work climates (Simosi & Xenikou, 2010; Jong & Den Hartog, 2007; Amabile, et. al., 1996). At the same time, organizational culture influences both leadership and human resource practices, as the basic values, assumptions and beliefs are reflected as structures, policy, practices, management practices and procedures (Schein, 1992; Martins & Terblanche, 2003; Bass, et. al., 1993).

**Figure 1** Human resources practices, leadership and culture within the bigger framework of innovation management system



Source: Own production.

In fact, a systemic approach must be adopted in innovation management taking into account many other elements. To become successful innovators, companies

need a systemic approach that addresses the underlying interrelated causes of innovation (Loewe & Dominiquini, 2006).

According to several models and innovation management proposals (Chiesa, et. al., 1996; COTEC, 1998; Jonash & Sommerlatte, 1999; Vilà & Muñoz-Nájar, 2002; Verhaeghe & Kfir, 2002; Shapiro, 2002; Von Stamm, 2003; Tidd, et. al., 2005; Loewe & Dominiquini, 2006; AENOR, 2006) besides the three elements that have been studied above, an innovation management system should encompass the following elements:

- Firms must define a clear innovation *strategy*, whose innovation objectives have been widely communicated among the organization's members, and which guide their efforts in the right direction and provide a framework to focus the use of scarce resources (Goffin & Mitchell, 2005).
- The firm must have an appropriate *organizational structure*, according to the innovation objectives to be met. The organizational structure must favour information flow, teamwork, as well as communication and cooperation among its members and between members and external agents. Innovation must be the main operational responsibility for company members (Andrew & Sirkin, 2008), so that at least one department has specific responsibilities to innovate depending directly on the top executive (Vilà & Muñoz-Nájar, 2002).
- It should be ensured that the organization has the necessary *financial resources* for people to put their ideas and innovation projects into action. Companies should assign funds to develop long term innovation plans correctly, so that innovation activities' financing is stable. Companies have to be informed about public subsidies and other forms of public financing that may exist, making use of them to support their innovation strategy.

- For successful innovation, firms provide their employees with *Innovation Management Tools* (IMTs) and the training they require to use them (Hidalgo & Albors, 2008). Innovation does not always require the use of the latest sophisticated technology; it is a question of thinking and searching for creative solutions within the company. In this respect, IMTs are considered as “a range of tools, techniques and methodologies that help companies to adapt to circumstances and meet market challenges in a systematic way” (European Commission, 2004).
- *Information and Communication Technologies* (ICTs) accelerate exchange of information among organization members and allow fluent communication between the members of an alliance developing innovation.
- The basic *innovation process* is strongly supported by *technology management* and *knowledge management*, both disciplines closely related to innovation management. Technology management requires the definition of a technology strategy, the selection, generation and acquisition of technology (deciding which technologies will be developed internally and which acquired externally) and the management of intellectual property assets (patents, copyrights, registered trademarks, trade secrets, etc.) (CIDEM, 2002). On the other hand, knowledge is crucial for innovation, so knowledge management, which guarantees that people can access it whenever they need it, is an essential element in innovation management. Knowledge management (which involves organizing knowledge within the company, so that is classified and can be easily accessed and used; distributing it efficiently throughout the organization; and sharing it among organization members) is crucial to innovate and becomes an important part of the innovation process (Scarbrough, 2003; European Commission, 2004).

- The innovation process should be *client oriented*, that is, the client must become the centre of innovation. To do that it is necessary to find out about, listen to and answer client requirements (Club Excelencia en Gestión, 2006; Hidalgo, et. al. 2008). This element is considered a *sine qua non* condition for the success of innovation process.
- Many external agents and sources of innovation can make a significant contribution to a company's innovation capability. Most innovation management models emphasize the phenomenon of *open innovation* (Chesbrough, 2006; Gassmann, 2006), highlighting the role of the *Networking (or collaboration or alliances)*, which involves building and supporting effective external links, thereby making use of all the external agents' knowledge, resources and intelligence.
- *Environment monitoring or scanning* implies analyzing and searching the environment for potential innovations, threats and opportunities for change. Monitoring involves a group of activities aimed at searching, processing and distributing internal and external information that is useful for the decision-making process. This information collection must be well-organized and systematic.
- Improvements achieved in competitive advantage must be harnessed by the company. As many innovation management models emphasize, *measurement and tracking* are imperative for continuous improvement. Highly innovative companies consider that innovation and its results can be evaluated and they devote considerable time and attention to developing their own, distinctive innovation metrics.
- *Organizational learning* consists of reviewing successes and failures with the objective of learning how to improve innovation management and make use of

relevant knowledge that can be drawn from experience (Tidd, et. al., 2005). Companies that are poor at learning from their experiences inhibit further development of change and innovation capabilities (Holman, et. al., 2000). Audits on innovation systems allow improvements and corrections to be made.

Companies can establish a highly sophisticated and perfect *innovation process*, but if this is not *accompanied and strengthened by this complete set of elements*, *the process results will be affected* (Velasco & Zamanillo, 2008). When implementing the different elements, the company *must combine them consistently, considering interrelations and aligning them in the right direction*.

This paper focuses on the relationship between human resources practices with leadership and organizational culture *within the bigger and broader framework of an innovation management system*. More specifically, it aims to study how a group of Basque innovative companies implement these three elements in the context of their organizations and within their innovation management systems. Therefore, the proposal for research is to analyze how Basque innovative firms align the elements that are related to creating an organization committed to innovation and where people actively engage in innovation activities. Or in other words, to study how they put into practice *human relation* policies, the routines to deploy effective *leadership* and develop *innovation culture*, and to search if they put equal emphasis on all three elements or if they concentrate mainly on one of them. We will develop these ideas through an empirical study looking at the behaviour of a group of innovative Basque companies.

### **3 General Methodology**

The objective of the study was to obtain a sample of renowned companies in order to study in depth the innovation management practices developed by a group

of innovative companies. The innovation concept applied in the research had wide scope, not just limited to the sphere of technology. Consequently, a definition given by the OECD in its Third Edition of the Oslo Manual was adopted: "An innovation is the implementation of a new or significantly improved product (goods or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations" (OECD, 2005).

So a list was drawn up using two different sources. On the one hand, there were 150 firms that achieved higher grants in the last call (2006) for bids within the framework of the Basque Government's Science, Technology and Innovation Plan. The list was provided by the Regional Development Agency (SPRI), and included companies that had developed technological innovation projects during the previous tax year. On the other hand, the list of 83 companies selected by the Basque Knowledge Cluster as "Advanced Management Study Cases" was also used. Since 1998, the Basque Country's Knowledge Cluster has been publishing a collection of "best practices," analyzing management foundations and keys to success from some of the most outstanding and distinguished Basque firms. This list has also been used in other research projects (Rodríguez Castellanos, et. al., 2006), as it provides a list of firms that have been selected due to their excellent business results, financial returns, growth, international expansion, as well as for having a distinctive and innovative feature in their management, which drives their competitive advantage. The criteria used to select this pool of corporations meet the standards required for the research as these firms are not only technology innovators but also innovators in a wider sense.

There were a total of 22 companies appearing in both lists, of which, by chance, half were public limited companies whilst the other half were cooperatives, all of them belonging to Mondragón Corporación Cooperativa (MCC) except for one. It should be highlighted that Basque cooperative movement and Social Economy have many special features, including the existence of one of the biggest industrial



groups in Spain, MCC (Bakaikoa, et. al., 2004; Charterina, et. al., 2007; Irizar & MacLeod, 2008).

As shown in table 1, 27.3% of studied firms were SMEs (less than 250 employees), 9.1% had between 250 and 499 employees, another 27.3% between 500 and 999, and 36.4% had more than 1000 employees, so the group encompasses all company sizes. These firms belong to the Basque Country's most intensive innovation expenditure sectors, and these sectors are also some of the most representative of regional industry, as this is where a high percentage of firms are working.

They are leading companies in automation, aeronautics, white goods, electrical machine, machine-tools and electronic material sectors, among others, that spend an average of almost 3.5% of their turnover on R&D. The selected companies attained an average turnover of 332 million Euros and have an average of 70 people working on R&D activities. Four of the selected companies are among the top 1000 EU companies in R&D expenditure according to the 2009 "EU Industrial R&D Investment Scoreboard" (This companies are Fagor Electrodomésticos, which ranked 247<sup>th</sup>; Grupo ITP (Industria de Turbo Propulsores), in 267<sup>th</sup> position; Gamesa, ranking 345<sup>th</sup>; and CIE Automotive, which ranked 637<sup>th</sup>).

**Table 1** Companies by size and technological level

<i>Size</i> \ <i>Technological level</i>	<i>Low</i>	<i>Medium Low</i>	<i>Medium High</i>	<i>High</i>	<i>Total</i>
0-249	1	1	3	1	<b>6</b>
250-499			2		<b>2</b>
500-999		1	4	1	<b>6</b>
≥ 1000			5	3	<b>8</b>
<b>Total</b>	<b>1</b>	<b>2</b>	<b>14</b>	<b>5</b>	<b>22</b>

Source: Own production.

On the other hand, the operationalization of variables in each construct was referred to by previous researchers. Variable composition and reference sources are shown in Table 2.

**Table 2** Questionnaire design of constructs

<b>Construct</b>	<b>Questionnaire composition</b>	<b>Resources of literature references</b>
Leadership	6	Chiesa, Coughlan & Voss (1996); Muñoz-Nájjar & Vilà (2000); Innovation Management Toolkit (n.d.); CIDEM (2002); Loewe & Dominiqini (2006)
Culture	6	Innovation Management Toolkit (2000); Muñoz-Nájjar & Vilà (2000); Martins & Terblanche (2003); Von Stamm (2003); Tidd, Bessant & Pavitt (2005); Club Excelencia en Gestión (2006)
Human Resources	6	Brockbank (1999); Innovation Management Toolkit (2000); Muñoz-Nájjar & Vilà (2000); Entertain (n.d.); Loewe & Dominiqini (2006)

Source: Own production.

In this way, in the field of *leadership* the following procedures, routines and practices were studied in the innovative companies:

- Top managers are committed to innovation and this commitment is reflected in the time and resources they provide and devote to innovation activities, encouraging personnel initiatives, in the organizational structure they design, etc.,
- Top managers manage innovation integrally, innovation objectives are well defined, processes to develop innovation from ideas to market are designed, and innovation performance indicators are monitored,
- Leaders promote risk assumptions and reward the generation of new ideas to create the right environment for innovation,
- Values that promote innovation have been established by top managers and they act as an example,

- Top managers reflect their commitment to innovation in their external communication with customers (in selling arguments included in catalogues, leaflets, brochures, etc.),
- The company earns a reputation for innovation, growth and sensitivity with their clients, suppliers and investors.

Regarding building an innovation *culture*, the study examined how far they implemented practices and routines such as:

- Wide recognition awarded to the value of creativity and entrepreneurialism exists at all organizational levels,
- Company culture favours change and capitalizes on new ideas and opportunities,
- Company culture encourages all employees to suggest new ideas; these suggestions are taken into account as they can be the origin of small improvements and even huge and radical innovations,
- There is broad acceptance of the risk involved in innovation and mistakes and errors are widely accepted as an element inherent to innovation,
- Open communication is supported to facilitate information exchange that promotes identifying opportunities to innovate,
- The physical work environment or lay-out facilitates and boosts collaboration, communication and creative interaction.

Finally, the *human resources* construct referred to so-called traditional human resources practices (Brockbank, 1999), such as:

- Recruitment policies support innovation, seeking out employees with different experience and knowledge

- The firm retains its most valuable employees, personnel with talent, experienced and well trained
- Personnel development policies support acquiring key competencies for innovation (specific technical knowledge, creative abilities, team work, problem resolution, decision analysis, risk/opportunities analysis, project management, etc)
- Evaluation policies promote a favourable attitude from employees to running initiatives and contributions
- Recognition and reward policies favour innovation (original ideas, entrepreneurship spirit, sharing information, etc. are awarded)
- Firms provides time and resources for employees to develop ideas and promising opportunities

Apart from the processes and routine involved in human resource practices, leadership and culture, the general managers of the firms answered another 67 questions regarding the processes and practices related to the remaining elements involved in innovation management systems. The organization's general manager had to assess the degree of application for different processes, practices and routines within their firms. When rating the degree of implementation of certain processes, 0 was given for *never*, 1 for *seldom*, 2 for *sometimes*, 3 for *often* and 4 for *always*.

#### **4 Result**

Regarding the study of the three variables, a Principal Components Analysis (PCA) was applied to the data in order to study the relationship among them (Escofier & Pagès, 1990; Lebart, et. al., 1995). As it can be seen in Table 3, the

value of the determinant indicates that factorial analysis is an adequate technique for these data. Both values of the tests carried out (Table 4) indicate that factorial analysis is a suitable technique.

**Table 3.** Correlation Matrix (\*)

		Leadership	Culture	Human Resources
Correlation	Leadership	1,000	,548	,486
	Culture	,548	1,000	,718
	Human Resources	,486	,718	1,000
Sig. (1-tailed)	Leadership		,004	,011
	Culture	,004		,000
	Human Resources	,011	,000	

(\*) Determinant = ,330  
Source: Own production.

**Table 4.** KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,672
Bartlett's Test of Sphericity	Approx. Chi-Square	21,248
	df	3
	Sig.	,000

Source: Own production.

In this way, a typology of companies was produced by applying cluster analysis to the coordinates obtained in PCA. PCA provides the following communalities and histogram, as well as the weight of the variables that compose each dimension.

**Table 5** Communalities

	Initial	Extraction
Leadership	1,000	,996
Culture	1,000	,847
Human Resources	1,000	,881

Source: Own production.

**Table 6** Eigenvalues and Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,174	72,480	72,480	2,174	72,480	72,480
2	,549	18,309	90,789	,549	18,309	90,789
3	,276	9,211	100,000			

Source: Own production.

**Table 7** Component Matrix

	Component	
	1	2
Leadership	,780	,622
Culture	,898	-,203
Human Resources	,872	-,348

Source: Own production.

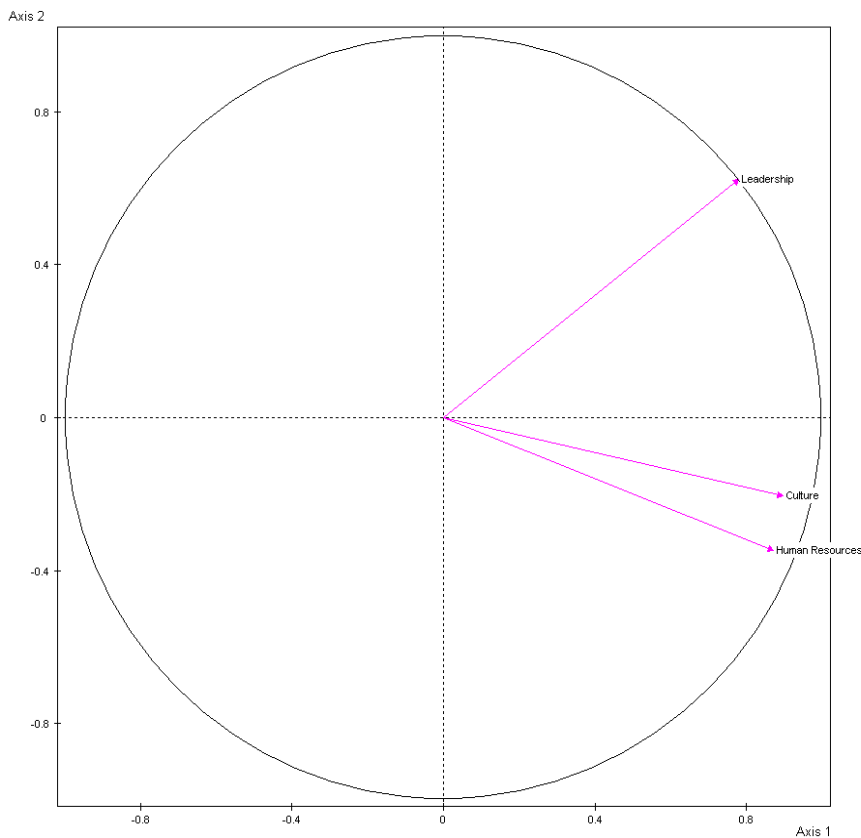
As shown in Table 6, the first 2 factors explain 90.78% of the data variability (where a factor is a linear combination of the initial variables). Therefore, dimension can be reduced from 3 axes to 2, maintaining 90.79% of the information. All the variables and individuals (companies) are well represented by these 2 factors.

In figure 2, we can see that factor 1 is a *size factor*, which means that if a company exhibits high values in any of these variables, it also exhibits high values in the other variables (Lebart, et. al., 1984). In the same way, if a company exhibits low values in any of these variables, also exhibits low values in the other variables. We will call this factor the *mobilization effort factor*, as it measures the effort made by the company using the three variables.

It can also be observed, that factor 2 puts leadership (+) against human resources and culture (-). This means that two companies can have the same value

in factor 1, but one can have obtained this value because it has higher leadership, while the other could have achieved it because it has higher human resources and culture. For example, companies 12 (E12) and 16 (E16) in Figure 3, both have the same value in factor 1 (they make the same mobilizing effort), but company 12 has achieved this value through human resources and culture, while company 16 has done it though strong leadership. We will call factor 2, *effort type factor*.

**Figure 2** Figure of Variables



Source: Own production.

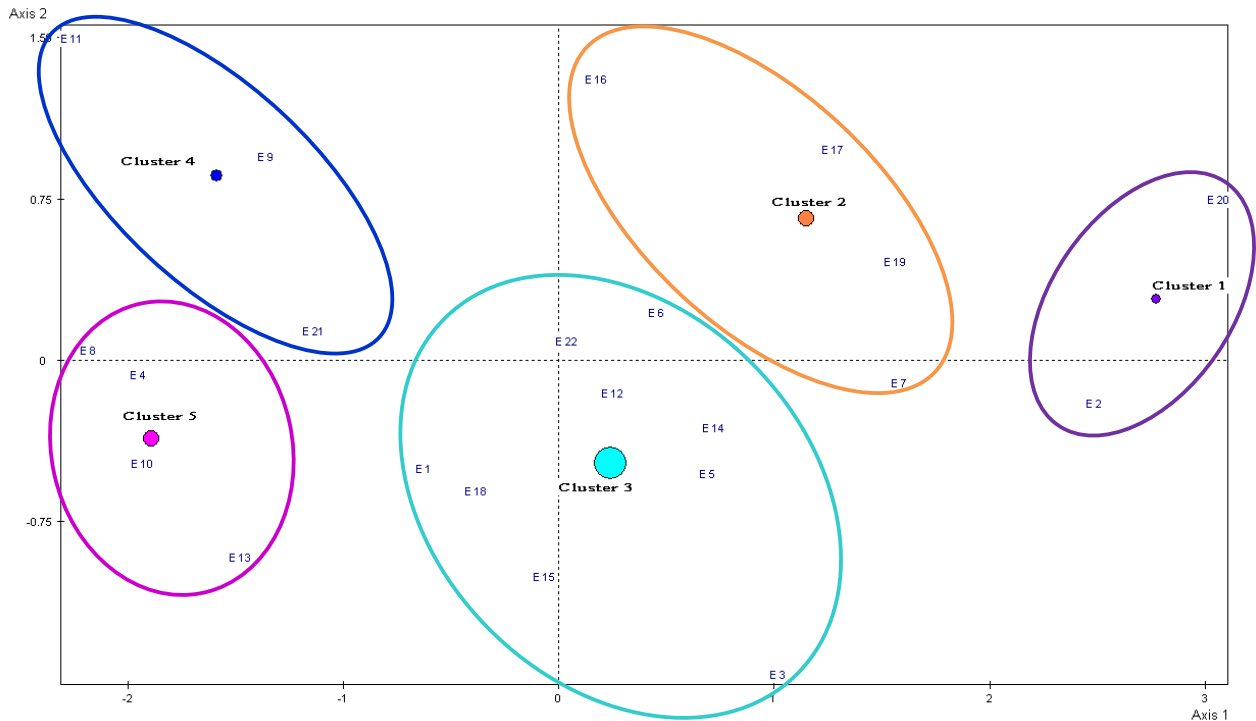
Using three criteria (the ratio  $inertia\ inter / total\ inertia = 0.8293$ -, the structure of dendograms, and the significance of the classes) we obtained five groups-clusters for companies.

**Table 8** Cluster means when applying the three variables and when implementing all elements of an innovation management system

<b>Variables</b>	<b>Cluster 1</b>	<b>Cluster 2</b>	<b>Cluster 3</b>	<b>Cluster 4</b>	<b>Cluster 5</b>	<b>Means</b>
Leadership	3.58	3.33	2.69	2.76	2.25	2.81
Human Resources	3.17	2.63	2.57	1.83	2.13	2.45
Culture	3.17	2.75	2.70	2.07	2.00	2.54
Innovation Management System	3.29	3.05	2.51	2.42	2.41	2.65

Source: Own production.

**Figure 3** Figure showing Individuals (Companies) and Clusters



Source: Own production.

Regarding the behaviour of firms in terms of deploying the practices and routines related to the variables we want to study, the cluster analysis reflects the existence of 5 groups of companies. Arranged according to the mobilization factor we found that:



- Cluster 1 is made up of 2 companies (E2 and E20). The companies belonging to this cluster are characterized by *high levels of mobilization effort*, standing out due to high deployment of *human resources practices* that promote innovation, an intense emphasis on the routines and processes to promote *innovation culture*, and *mainly because of strong leadership* from their top managers. In this sense, these Basque innovative companies make use of the three elements so that they reinforce and support each other.

At the same time, as it can be seen in Table 9, companies that belong to this cluster are *the most systematic in terms of applying all the elements involved in an innovation management system*, especially E20, which is the most systematic in implementing all the elements.

**Table 9** Cluster 1

<b>Characteristic variables</b>	<b>Cluster mean</b>	<b>Overall mean</b>	<b>Cluster Std. deviation</b>	<b>Overall Std. deviation</b>	<b>Test-value</b>	<b>Probability</b>
Leadership	3.583	2.815	0.250	0.445	2.50	0.006
Human Resources	3.167	2.455	0.000	0.439	2.35	0.009
Culture	3.167	2.539	0.000	0.425	2.14	0.016

Source: Own production.

- 4 companies belong to Cluster 2 (E7, E16, E17 and E19). This *cluster does not make as greater mobilization effort as cluster 1*, but they still put into practice on a regular basis the three elements that are useful to involve company personnel in innovation. As previously, this group also *stands out due to the active leadership* role played by its top managers in promoting innovation activities.

On the other hand, as shown in Table 10, this cluster's companies *make an above-average application of all the elements involved in an innovation*

*management system*, especially E19 and E7 that implement all the elements of innovation management with the second and third highest regularity.

**Table 10** Cluster 2

<b>Characteristic variables</b>	<b>Cluster mean</b>	<b>Overall mean</b>	<b>Cluster Std. deviation</b>	<b>Overall Std. deviation</b>	<b>Test-value</b>	<b>Probability</b>
Leadership	3.333	2.815	0.118	0.445	2.52	0.006
Culture	2.750	2.539	0.186	0.425	1.07	0.142
Human Resources	2.625	2.455	0.298	0.439	0.84	0.201

Source: Own production.

- Cluster 3 is made up of 9 companies (E1, E3, E5, E6, E12, E14, E15, E18 and E22), which show *medium level of mobilization effort*, although lower than cluster's 2 companies. This group of Basque companies is characterized by their *stronger promotion of innovation culture*. In comparison with previous clusters, this cluster's mobilization effort *does not emanate from the leadership*, as they do not make a big effort to implement it. Instead, they *regularly put into practice human resources policies* that foster innovation, which together with *culture* is the element chosen by these enterprises to mobilize members' full innovative and creative potential.

This group of companies *regularly apply all the elements involved in an innovation management system*, although *they do not attain the average level*.

**Table 11** Cluster 3

<b>Characteristic variables</b>	<b>Cluster mean</b>	<b>Overall mean</b>	<b>Cluster Std. deviation</b>	<b>Overall Std. deviation</b>	<b>Test-value</b>	<b>Probability</b>
Culture	2.704	2.539	0.270	0.425	1.47	0.070
Human Resources	2.574	2.455	0.262	0.439	1.04	0.149
Leadership	2.685	2.815	0.214	0.445	-1.11	0.133

Source: Own production.

- Cluster 4 is made up of 3 companies (E11, E9 and E21), which do *not make as great a mobilizing effort as the previous cluster's* companies (mobilization factor below mean). This cluster of companies chose to involve their members in innovation activities through the *use of leadership* (a value close to overall mean), while they almost give up using *human resource practices and culture* as a mean for that end (both below overall means and both statistically significant) .

This cluster's firms display *lower than the average implementation of the innovation management systems' elements*.

**Table 12** Cluster 4

<b>Characteristic variables</b>	<b>Cluster mean</b>	<b>Overall mean</b>	<b>Cluster Std. deviation</b>	<b>Overall Std. deviation</b>	<b>Test-value</b>	<b>Probability</b>
Leadership	2.756	2.815	0.110	0.445	-0.24	0.404
Culture	2.067	2.539	0.166	0.425	-2.03	0.021
Human Resources	1.833	2.455	0.272	0.439	-2.58	0.005

Source: Own production.

- 4 companies belong to Cluster 5 (E4, E8, E10 and E13), which makes the *lowest mobilization effort* of all, as the companies do not show perseverance in implementing the elements that increase people's engagement in innovation activities within organizations (in the three variables their means are below average and the three are statistically significant). These 4 companies are remarkable for *concentrating their effort on human resources practices* in order to mobilize their members.

At the same time, this group of companies *demonstrate the lowest implementation level of all the elements involved in an innovation management system*.

**Table 13** Cluster 5

<b>Characteristic variables</b>	<b>Cluster mean</b>	<b>Overall mean</b>	<b>Cluster Std. deviation</b>	<b>Overall Std. deviation</b>	<b>Test-value</b>	<b>Probability</b>
Human Resources	2.125	2.455	0.217	0.439	-1.62	0.052
Culture	2.000	2.539	0.118	0.425	-2.74	0.003
Leadership	2.250	2.815	0.083	0.445	-2.74	0.003

Source: Own production.

A detailed study of these company clusters reveals interesting results:

- In general, there is a *positive relationship between the systematic implementation of innovation management system elements and mobilizing factor*. Hence, companies that place higher emphasis on involving all company members in innovation activities are at the same time the ones that implement the elements of an innovation management system more systematically.
- Regarding the legal status of the companies, following the results of Fernández de Bobadilla and Velasco (2009), some differences in innovation management of Basque innovative cooperatives in comparison with public limited companies can be underlined. In this way, 5 out of the 11 *cooperatives make use of innovation culture* as a means to involve and motivate people to innovate (cluster 3), while 3 attain that objective *making relatively higher use of human resources practices* (cluster 5).

On the other hand, only 4 out of 11 *public limited companies* select *innovation culture* as their preferred way of creating the right environment to innovate (cluster 3), while 6 choose to *foster that through active leadership* (clusters 1, 2 and 4).

- If the technological level is considered, companies from cluster 3, i.e., those who prefer the *alternative of an innovation culture* in order to mobilize the full potential of its members, all have a *high or medium-high technological level*. Meanwhile, *none of the companies with low or medium-low technological level use culture* (2 companies use human resource practices and 1 applies leadership).
- It is worth highlighting that all companies *with low or medium-low technological levels belong to groups that make smaller mobilizing efforts* (cluster 4 and 5), appearing on the left hand side of the diagram. If the technological level is considered, companies from cluster 3, i.e., those who prefer the *alternative of an innovation culture* in order to mobilize the full potential of its members, all have a *high or medium-high technological level*. Meanwhile, *none of the companies with low or medium-low technological level use culture* (2 companies use human resource practices and 1 applies leadership).

It is worth highlighting that all companies *with low or medium-low technological levels belong to groups that make smaller mobilizing efforts* (cluster 4 and 5), appearing on the left hand side of the diagram.

- Considering the size of the companies, we can see that in *very large companies* (above 1000 employees) *the use of leadership* to obtain commitment from employees prevails, which is used in 5 out of 8 enterprises (cluster 1, 2 and 4). In the *large firms* (between 500 and 999 employees) the preferred alternative for 4 out of 6 companies is *culture* (cluster 3) and *human resources* (cluster 5), among companies with 250-499 employees *none chooses to use leadership* (1 belongs to cluster 3 and the other to cluster 5), while among the SMEs 3 *apply culture* (cluster 3), 1 uses human resources (cluster 5) and 2 leadership (cluster 4). In fact, the *most innovative SMEs chose to build an innovation culture* in order to involve and commit company personnel to innovation activities.

One reason that could explain this tendency is a lack of time and resources for SMEs. So instead of devoting time and resources to demonstrate their continuous commitment towards innovation, top SME managers can consider a more effective way to develop the right innovation culture, based on empowered people with common values and vision concerning innovation. Once an innovation culture has been built, top SME managers can focus their limited time and effort on other strategic issues. On the other hand, small businesses can experience difficulties in developing or obtaining the appropriate talent, since they are unable to offer the salaries and benefits of large companies (Beaver & Prince, 2002), so a sensible strategy could be to create an attractive working environment and innovation culture, where people feel free to communicate and put into practice new ideas.

- Regarding companies with *the highest R&D expenditure* (third quartile), they are all *companies making greater mobilizing efforts*, appearing on the right hand side of the diagram, using mainly both *culture* and *leadership* to promote innovation among its members (3 belong to cluster 3, 2 to cluster 2 and 1 to cluster 1). In the case of companies with the *lowest R&D expenditure* (first quartile), *all except 2* are on left hand side of the diagram, belonging to the *clusters that make the lowest mobilizing effort* (2 are included in cluster 4 and 2 in cluster 5). 2 companies provide an exception as they belong to cluster 3 and *apply culture* to involve people in innovation.
- Finally, another interesting conclusion is that *among the 4* companies that belong to cluster 5, which *stands out for the use of human resource practices*, 2 of them *show the highest productivity levels* among the 22.

## 5 Conclusions

This paper has addressed the issue of how organizations create the necessary incentives and the right environment for people to develop their own creativity and commitment to innovation. *Three different and complementary ways to mobilize the full innovative potential of an organization's members* have been discussed.

Many studies focus on organizational culture and innovation relation (Škerlavaj, et. al., 2010; Khazanchi, et. al., 2007; Jassawalla & Sashittal, 2002), on leadership and innovation (Jung, et. al., 2008; Jung, 2001; Smith, 2002; Shin and Zhou, 2003), on human resource practices and innovation (Pérez López, et. al., 2005; Leede & Looise, 2005; Shipton, et. al., 2005; Katou & Budhwar, 2008), on culture - leadership - innovation relation (Sarros, et. al., 2008; Simosi & Xenikou, 2010), or on culture -human resources - innovation relationship (McLean, 2005; Lau & Ngo, 2004). An important contribution of this paper is that it makes an attempt to integrate the three elements affecting employee's behaviour and does it within the bigger and broader framework of an innovation management system.

In this regard, recently Jung and Takeuchi (2010) also examined the interrelationships among top management leadership, organizational culture and human resource practices and their effects on organizational performance. The main difference with these authors's approach is that they investigate the causal relation among the elements, while we have focused on their implementation pattern. Jung and Takeuchi (2010) conclude that the dominance of a culture within a company is an antecedent of top management's supportive leadership, which in turn requires a particular human resource practice (a performance-based appraisal) that eventually leads to better organizational performance. Our study has concentrated in the use of those three elements in highly innovative companies, assuming that a company could also decide to deploy just one.

The findings of our research have a number of practical implications that we would like to underline. Firstly, a *mobilization effort factor* exists which measures the effort made by a company in the use of the three variables. Secondly, among Basque innovative firms, *the greater a company's average mobilizing effort, the higher the regular implementation of all elements of an innovation management system, and vice versa*. Thirdly, the *effort type factor* indicates that two companies with the same mobilizing effort could achieve this either through high implementation of processes and practices in the field of leadership, or through application in the area of human resources practices and innovation culture. Fourthly, five company's clusters can be identified among innovative Basque companies, ranging from firms with the highest mobilizing factor through the use of leadership, to businesses with the lowest mobilizing factor that are characterized by the use of human resources practices to obtain involvement from their company members. Fifthly, *leadership-type effort predominates among very large companies (more than 1000 employees) and also among public limited companies. Cooperatives and SMEs show a higher tendency to develop an innovation culture-type effort* in order to involve their personnel in innovation activities. Companies with *low or medium-low technological level make lower mobilizing effort and none uses culture-type effort*. Finally, Basque innovative companies with the *highest R&D expenditure demonstrate higher mobilizing effort*.

Although we have found an interesting pattern in our analysis regarding the use of the three variables, some limitations of this study should be noted. On the one hand, the findings and their implications are obtained from a small sample of innovative companies. Thus, caution is required when generalizing our conclusions. It would be interesting to run similar studies incorporating a higher number of companies. On the other hand, Basque cooperatives and Social Economy have many unusual characteristics. Therefore it would also be interesting to carry out similar studies in other regions. In this sense, in the case of the Basque Country,



some innovative companies tend to make an emphasis in the use of leadership, while others, adopting a more *laissez faire* approach, design human resource policies to create the right incentives and promote an innovation culture so that everybody performs according to the same set of beliefs. If the same analysis is conducted in a different regional context or environment, the results could be different. Future studies are therefore encouraged to extend this study to include other regions / nations and innovative companies.

An important managerial implication of this study is that on the one hand, it provides managers with a list of practices and routines in the field of leadership, culture and human resource that may be useful to create the right environment to innovate. On the other hand, the study concludes that the *mobilization effort* made by any company in order to use its members' full innovative potential can be measured, and therefore, companies can be assessed and their progress can be monitored. People are the source of innovation and nothing can be done without them. So, the greater the mobilization effort, the stronger is the company's attempt to involve its members in innovation activities and take advantage of their creative capabilities. Therefore, the results of this paper will help managers measure the efforts made by their companies when putting the human factor into action towards the goal of innovation.

## **References**

AENOR (2006). UNE 166002, Norma española. Gestión de la I+D+I: requisitos del sistema de gestión de la I+D+I. AENOR, Madrid.

Ahmed, P.K. (1998). Culture and climate for innovation. *European Journal of Innovation Management*, vol. 1, nº 1, 30-43

Albert, M. & Picq, T. (2004). Knowledge-based organizations: perspectives from San Francisco Bay area companies. *European Journal of Innovation Management*, vol. 7, Nº 3, 169-177

Amar, A.D. (2001). Leading for innovation through symbiosis. *European Journal of Innovation Management*, Vol. 4, Nº 3, 126-132

Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal*, 39, 1154-84.

Andrew, J. P. & Sirkin, H. L. (2008). Aligning for Innovation. *Global Business and Organizational Excellence*, DOI: 10.1002/joe, September/October.

Bass, B.M., and Avolio, B.J. (1993). Transformational Leadership and Organizational Culture, *Public Administration Quarterly*, 17, 1, 112-121.

Bakaikoa, B.; Begiristain, A.; Errasti, A.; Goikoetxea, G. (2004). Redes e innovación cooperativa. *CIRIEC-España*, nº 49, 263-294.

Beaver, G. & Prince, C. (2002). Innovation, entrepreneurship and competitive advantage in the entrepreneurial venture. *Journal of Small Business and Enterprise Development*, vol. 9, nº 1, 28-37

Brand, A. (1998). Knowledge Management and Innovation at 3M. *Journal of Knowledge Management*, vol. 2, nº 1, 17-22.

Brockbank, W. (1999). If HR Were Really Strategically Proactive: Present and Future Directions in HR's Contribution to Competitive Advantage. *Human Resource Management*, Vol. 38, No. 4, 337-352

Charterina, J., Albizu, E. & Landeta, J. (2007). The quality of management in Basque companies: differences existing between cooperative and non-cooperative companies. *Advances in Economic Analysis of Participatory and Labor-Managed*

Firms, Cooperative Firms in Global Markets - Incidence, Viability and Economic Performance, vol. 10, 111-155.

Chen, C-J. & Huang, J-W. (2009). Strategic human resource practices and innovation performance-The mediating role of knowledge management capacity. *Journal of Business Research* 62 (2009) 104-114

Chesbrough, H. (2006). *Open Business Models: How to Thrive in a New Innovation landscape*. Harvard Business School Press, Boston, MA.

Chiesa, V.; Coughlan, P. & Voss, C. A. (1996). Development of a Technical Innovation Audit. *Journal of Product Innovation Management*, 13, 105-136.

CIDEM (2002). *Guías de gestión de la innovación. Parte 1: diagnóstico*. Generalitat de Catalunya, Departamento de Trabajo, Industria, Comercio y Turismo, Barcelona.

Claver, E., Llopis, J., Garcia, D., & Molina, H., 1998. Organizational culture for innovation and new technological behavior. *The Journal of High Technology Management Research* 9 (1), 55-68.

Club Excelencia en Gestión (2006). *Marco de Referencia de Innovación*. Club Excelencia en Gestión, Madrid.

Collins, C. J., & Clark, K. D. Strategic human resource practices, top management team social networks, and firm performance: the role of human resource in creating organizational competitive advantage. *Acad Manage J* 2003 46, 6, 740-51.

COTEC (1998). *TEMAGUIDE: A Guide to Technology Management and Innovation for Companies*. COTEC, Madrid.

Dobni, C. B. (2008). The DNA of Innovation. *Journal of Business Strategy*, Vol. 29 No. 2, 43-50.

Entertain (n.d.). <http://www.sme-innova.com/entertain>, Entering tailored innovation management in very small enterprises, EU project, Enterprise DG, accessed June 2006

Erlicher, L. & Massone, L. Human factors in manufacturing: New patterns of cooperation for company governance and the management of change. Human Factors and Ergonomics in Manufacturing & Service Industries. Volume 15, Issue 4, Autumn (Fall), 403–419.

Escofier, B. & Pagès, J. (1990). Analyses factorielles simples et multiples. Dunod.

European Commission (2004). Innovation Management and the Knowledge-Driven Economy. ECSC-EC-EAEC, Brussels-Luxembourg.

European Commission (2007). European Innovation Scoreboard 2006. Comparative Analysis of Innovation Performance. [http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=248&parentID=51#\\_ftn1](http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=248&parentID=51#_ftn1), accessed November 2008

Fernández de Bobadilla, S. & Velasco, E. (2009). ¿Gestionan mejor la innovación las empresas de economía social que las sociedades anónimas?: Estudio comparativo de empresas innovadoras vascas. CIRIEC-España, nº 63, 5-37.

Fernández Pérez, A. M. & León Rodríguez, M. D. (2006). Actividades de I+D e innovación en las regiones de Europa: indicadores y experiencias de éxito. Revista de Estudios Regionales, Nº 76, 77-103

Gassmann, O. (2006). Opening up the innovation process: towards an agenda. R&D Management, 36 (3), 223-228.

Goffin, K. & Mitchell, R. (2005). Innovation Management: Strategy and Implementation using the Pentathlon Framework. Palgrave Macmillan, UK.

Gumusluoglu, L. & Ilsev, A. (2009). Transformational leadership, creativity, and organizational innovation. *Journal of Business Research*, Volume 62, Issue 4, April, Pages 461-473

Harborne, P. & John, A. (2003). Creating a project climate for successful product innovation. *European Journal of Innovation Management*, vol. 6, n 2, 118-132

Holman, D., Axtell, C., Clegg, C., Pepper, K., Waterson, P., Cantista, I. & Oldergrey, M. (2000). Change and innovation in modern manufacturing practices: An expert panel survey of U.K. companies. *Human Factors and Ergonomics in Manufacturing & Service Industries*, Volume 10, Issue 2, Spring, 121-137

Hidalgo Nuchera, A., Vizán Idoipe, A. & Torres, M. (2008). Los factores clave de la innovación tecnológica: claves de la competitividad empresarial. *Dirección y Organización*, nº 36, 5-22.

Hidalgo, A. & Albors, J. (2008). Innovation management techniques and tools: A review from theory and practice. *R&D Management*, 38, 113-127.

Innovation Management Toolkit (n.d.). <http://innovationtoolkit.gc.ca>, Government of Canada website, Supported by Industry Canada, accessed November 2007

Irizar, I. & MacLeod, G. (2008). Innovación emprendedora en el Grupo Mondragón: el Caso de sus Centros Tecnológicos. *CIRIEC-España*, nº 60, 41-72.

Jager, B., Minnie, C., Jager, J., Welgemoed, M., Bessant, J. & Francis, D. (2004). Enabling continuous improvement: a case study of implementation. *Journal of Manufacturing Technology Management*, Vol. 15, Nº 4, 315-324

Jassawalla, A. R., & Sashittal, H. C. (2002). Cultures that support product innovation processes. *Academy of Management Executive*, 16(3), 42-53

Jonash, R.S. & Sommerlatte, T. (1999). *The Innovation Premium. How next-generation companies are achieving peak performance and profitability.* Perseus Books, United States of America.

Jong, J.P.J. & Den Hartog, D.N. (2007). How leaders influence employees' innovative behaviour. *European Journal of Innovation Management*, Vol. 10 No. 1, 2007, 41-64

Jung, D. (2001). Transformational and transactional leadership and their effects on creativity in groups. *Creativity Research Journal*, 13, 185–95

Jung, D., Chow, C., & Wu, A. (2003). The role of transformational leadership in enhancing organizational innovation: Hypotheses and some preliminary findings. *Leadership Quarterly*, 14, 525–544.

Jung, D., Wu, A. & Chow, C. (2008). Towards understanding the direct and indirect effects of CEOs' transformational leadership on firm innovation. *The Leadership Quarterly*, Volume 19, Issue 5, October, Pages 582-594

Jung, Y. & Takeuchi, N. (2010). Performance implications for the relationships among top management leadership, organizational culture, and appraisal practice: testing two theory-based models of organizational learning theory in Japan. *The International Journal of Human Resource Management*, Vol. 21, No. 11, September 2010, 1931–1950.

Katou, A. & Budhwar, P. (2008). The effect of Business Strategies and HRM policies on Organizational Performance: The Greek Experience. *Global Business and Organizational Excellence*, September/October, 40-57.

Khazanchi, S., Lewis, M. & Boyer, K. K. (2007). Innovation-supportive culture: The impact of organizational values on process innovation. *Journal of Operations Management* 25, 871–884

Knox, S. (2002). The boardroom agenda: developing the innovative organization. *Corporate Governance* 2, 1, 27-36

Kuczarski, T. (2003). What is innovation? And why aren't companies doing more of it?. *Journal of Consumer Marketing*, vol. 20, n 6, 536-541.

Lau, C.M. & Ngo, H.Y. (2004): The HR system, organizational culture and product innovation. *International Business Review*, 13, 685-703

Laursen, K. (2002). The importance of sectoral differences in the application of complementary HRM practices for innovation performance. *International Journal of Economics of Business*, vol. 9, nº 1, 139-156.

Laursen, K. & Foss, J.F. (2003). New human resource management practices, complementarities and the impact on innovation performance. *Cambridge Journal of Economics*, 2, 27, 243-263.

Lebart, L., Morineau, A. And Warwick, K.M. (1984). *Multivariate Descriptive Statistical Analysis*, John Wiley and sons.

Lebart, L.; Morineau, A. & Piron M. (1995). *Statistique Exploratoire Multidimensionnelle*. Dunod.

Leede, J. de & Loise, J.K. (2005). Innovation and HRM: Towards an Integrated Framework. *Creativity and Innovation Management*, vol. 14, nº 2, 108-117.

Loewe, P. & Dominiquini, D. (2006). Overcoming barriers to effective innovation. *Strategy & Leadership*, vol. 34, nº 1, 24-31.

López-Cabrales, A., Pérez-Luño, A. & Valle Cabrera, R. (2009). Knowledge as a mediator between HRM practices and innovative activity. *Human Resource Management*. Volume 48, Issue 4, 485-503.

Makri, M. & Scandura, T. A. (2010). Exploring the effects of creative CEO leadership on innovation in high-technology firms. *The Leadership Quarterly*, Volume 21, Issue 1, February, 75-88

Madsen, A.S. & Ulhøi, J.P. (2005). Technology innovation, human resources and dysfunctional integration. *International Journal of Manpower*, vol. 26, nº 6, 488-501

Martins, E.C. & Terblanche, F. (2003). Building organizational culture that stimulates creativity and innovation. *European Journal of Innovation Management*, vol. 6, Nº 1, 64-74

McDonough, E.F. III (2000). Investigation on factors contributing to the success of cross-functional teams. *Journal of Product Innovation Management*, vol. 17, 221-235.

McLean, L. D. (2005). Organizational culture's influence on creativity and innovation: A review of the literature and implications for human resource development. *Advances in Developing Human Resources*, 7(2), 226-246.

Muñoz-Nájjar, J.A. & Vilà, J. (2000). *Dirección Integral de la Innovación*. Technical Note IESE DGN 609, IESE Publishing, Barcelona.

OECD (2005). *Oslo Manual. Guidelines for Collecting and Interpreting Innovation Data*, Paris.

Pérez López, S.; Montes Peón, J.M. y Vázquez Ordaz, C.J. (2005). Human resource practices, organizational learning and business performance. *Human Resource Development International*, vol. 8, nº 2, 147-164.

Rammer, C.; Czarnitzki, D. & Spielkamp, A. (2009). Innovation success of non-R&D-performers: substituting technology by management in SMEs. *Small Business Economics*, 33, 35-58.



Rodriguez Castellanos, Araujo de la Mata, Hagemester, Landeta Rodriguez, Larrauri Estefanía, Rangelov Youlianov (2006). Capacidad Empresarial para la Absorción de Resultados de I+D: un Enfoque de Conocimiento. Principios, Análisis Empíricos y Directrices de Autoevaluación. Servicio Editorial de la UPV, Lejona

Sarros, J., Cooper, B., & Santos, J. (2008). Building a climate of innovation through transformational leadership and organizational culture. *Journal of Leadership and Organizational Studies*, 15, 145-158.

Scarborough, H. (2003). Knowledge Management, HRM and the Innovation Process. *International Journal of Manpower*, vol. 24, nº 5, 501-516.

Schein, E.H. (1992). *Organizational Culture and Leadership* (2nd ed.), San Francisco, CA: Jossey-Bass.

Shapiro, S. M. (2002). *24/7 Innovation. A Blueprint for Surviving and Thriving in an Age of Change*. McGraw-Hill, New York.

Shin, S.J. & Zhou, J. (2003). Transformational leadership, conservation, and creativity: evidence from Korea. *Academy of Management Journal*, Vol. 46 No. 6, 703-14.

Shipton, H., Fay, D., West, M., Patterson, M. & Birdi, K. (2005). Managing people to promote innovation. *Creativity and Innovation Management*, vol. 14, nº 2, pp. 118-128.

Shipton, H., West, M., Dawson, J., Birdi, K. & Patterson, M. (2006). HRM as a predictor of innovation. *Human Resource Management Journal*, vol. 16, nº 1, 3-27.

Simosi, M. & Xenikou, A. (2010). The role of organizational culture in the relationship between leadership and organizational commitment: an empirical study in a Greek organization. *The International Journal of Human Resource Management*, Vol. 21, No. 10, August, 1598-1616.

Škerlavaj, M., Song, J. H. & Lee, Y (2010). Organizational learning culture, innovative culture and innovations in South Korean firms. *Expert Systems with Applications*, Volume 37, Issue 9, September, 6390-6403

Smith, G.P. (2002). *The new leader: bringing creativity and innovation to the workplace*. Chart Your Course, Conyers, Georgia.

Som, A. (2006). Bracing for MNC Competition Through Innovative HRM Practices: The way ahead for Indian Firms. *Thunderbird International Business Review*, vol. 48 (2), 207-237.

Soupata, L. (2001). Managing Culture for Competitive Advantage at United Parcel Service. *Journal of Organizational Excellence*, Summer 2001.

Tesluk, P. E., Farr, J. L, & Klein, S. A. (1997). Influences of organizational culture and climate on individual creativity. *Journal of Creative Behavior*, 31(1), 27-41.

Tidd, J.; Bessant, J. & Pavitt, K. (2005). *Managing Innovation. Integrating Technological, Market and Organizational Change*. Third Edition, Wiley & Sons, England.

Tushman, M.L. & O'Reilly, C.A. (1997). *Winning through innovation: a practical guide to leading organizational change and renewal*. Harvard Business School Press, Boston, MA.

Välikangas, L. & Jett, Q. (2006). The golden spur: innovation independence. *Strategy & Leadership*, vol. 34, nº 5, 41-45.

Velasco, E. & Zamanillo, I. (2008). Evolución de las Propuestas sobre el Proceso de Innovación: ¿Qué se Puede Concluir de su Estudio?. *Investigaciones Europeas de Dirección y Economía de la Empresa*, Vol. 14, nº 2, 127-138.

Verhaeghe, A. & Kfir, R. (2002). Managing innovation in a knowledge intensive organization (KITO). *R&D Management*, 32, 5, 409-417.

Vilà, J. & Muñoz-Nájar, J.A. (2002). Guía de autoevaluación de las capacidades para innovar: Una herramienta de diagnóstico. Nota Técnica IESE DGN 629, IESE Publishing, Barcelona.

Von Stamm, B. (2003). *The Innovation Wave. Meeting the Corporate Challenge*. Wiley & Sons, England.

Yukl, G. (2002), *Leadership in Organizations*, 5th ed., Prentice-Hall, Englewood Cliffs, NJ.