

COUNTRY REPORT:

INNOVATION AND NEW TECHNOLOGIES IN SMES / HHRR

INTRODUCTION (MAX. 5 PAGES): GENERAL CONTEXT

I. Brief description of the country and region (size, population, socio economic structure, etc)

Spain is located in Southwestern Europe, with a total area of 505,370 sq km. Spain has two Autonomous Cities - Ceuta and Melilla - and 17 Autonomous Communities including Balearic Islands and Canary Islands.

The table beside shows the Spanish and foreign population registered by 2010, according to the latest revision of the Municipal Register¹ published by INE. Among the population registered in Spain in 2009, 12.1% was foreign, with an inter-annual increase of 7.2%. **Infant mortality** reached 3.35 per 1,000 births in 2008, this being the

Official Population figures			
Latest Data	January 1st, 2010	January 1st, 2009	Annual Rate (%)
Total Population	47,021,031	46,745,807	0.6
Foreign Population	5,747,734	5,648,671	1.8
Source: INE (taken on February, 2011)			

lowest in recent years. According to data from Eurostat, in 2007, the **life expectancy** at birth in Spain stood among the highest in the EU, being 84.3 years for females and 77.8 years for males. The total **Fertility Rate** (or average number of children per woman) was 1.38 until the first half of 2010 and the **childbearing age** for women increased slightly, reaching 31.1 years old (INE, 2011).

Spain public expenditure on **education** in 2007 was 4.28% of the GDP, which was under the EU average (5.04%). Social expenditure increased according to data from the Ministry of Labour and Immigration, nearly 2.7 million people received unemployment benefits in 2009, and almost twice the figure registered the previous year (47.7% more). According to Eurostat, Spain total expenditure on **social welfare** (2007) was 21% of GDP which was under the EU-27 average (26.2%). According to the Economically Active Population Survey (EAPS) in 2009, the active population stood at somewhat more than 23 million people. The activity rate thus reached 59.9% of the population aged 16 years old and over; the female activity rate was 51.6%, and the male activity rate was 68.6%. The number of employed people decreased 6.8% in comparison with 2008. By economic sector, construction was the most affected, with 23.0% fewer employed people, followed by industry (-13.3%). Service sector lost less workers (-2.5%) in the same period, considering that this sector employed 13,438.6 people in 2009, it is actually the core of the Spanish economy. The number of **unemployed** people in 2009 increased 60.2% as compared with the previous year,

¹ The **Municipal Register** is the administrative register in which all of the people who regularly reside in the municipality are recorded. The coordination of all of the Municipal Registers is carried out by the Spanish National Statistics Institute (INE), so as to avoid duplicities and is declared official by the Government, by Royal Decree.

exceeding 4.1 million people. In relative terms, the unemployment rate rose almost 7% standing at 18.0% of the active population (17.9% for men and 18.4% for women). Concerning the **Consumer Price Index (CPI)**, there was a moderate decrease in prices in 2009, for the first time since 1977. The average annual variation rate of the prices of consumer goods and services in 2009 stood at -0.3%. The **average expenditure per person** was 11,801 euros a year in 2007. The highest value was registered in single-person households, with 21,596 euros, when the person was under 65 years of age, and 15,182 euros, when the person was 65 years old or over. The relative poverty rate was 19.6%, reduced to 15.5% if considering the value of imputed rent, for dwellings that are owned or granted free-of charge.

National accounts, 2009 (first estimate)

		Interannual variation %
GDP mp at current prices (million euros)	1,051,151	-3.4
GDP per capita at current prices (euros)	22,886	-4.1
GDP per capita in PPP (EU-27=100). Year 2008*	102.6	

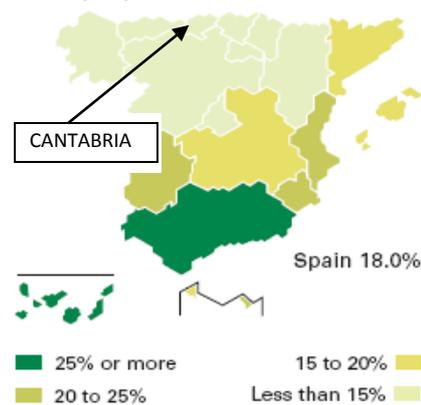
Source: Eurostat

Gross Domestic Product (GDP) at market prices in 2009 was estimated at 1,051,151 euros. The real growth of the Spanish economy (annual variation rate of GDP in volume) stood at -3.4%; GDP per capita at current prices was 22,886 euros for the nation as a whole, 4.1% less than the previous year. In terms of purchasing

power parity (PPP), GDP per inhabitant in Spain, in 2008, was 2.6% higher than the average of the EU-27, occupying the 12th place in the EU ranking. All of the Autonomous Communities and autonomous cities registered negative variation rates for GDP in the year 2009. In terms of GDP per capita, Basque Country recorded the highest figure, with 30,703 euros, while the lowest figure was registered in Extremadura, with 16,301 euros. Cantabria was just under EU's average (23,343 euros).

CANTABRIA

Unemployment rate, 2009



Location: The Autonomous Community of Cantabria is located in the central northern part of the Iberian Peninsula and occupies an area of 5,321 km², with 284km of coastline along the Cantabrian Sea which is its North border. It is also bordered by Asturias on the West, Castile and Leon on the South and the Basque Country on the East. The region can be divided in two different areas: coastland on a narrow strip on the North and the Cantabrian mountain range on the South. The capital of the region is Santander.

According to data from the INE, 589,235 inhabitants were living in Cantabria at 1 January 2009 (51% female and 49% male). 3/4 of the population was born in the region. Population density was

110.7 inhabitants/ km². Foreigners accounted for 6.5% of the population (38,096 people in 2009, according to ICANE²), among them 31.8% of the foreign residents were EU citizens, the remainder

² ICANE (Instituto Cántabro de Estadística), Cantabrian Statistics Institute, 2010. The figures are based on the Municipal Register (INE)

came largely from Latin America and non-EU European countries. Cantabria's birth rate by 2008 was 10.26%; mortality rate, 9.62%; and the average number of children per woman, 1.32. The majority of Cantabria's population lives in cities. In spite of this fact, the region is also noted for having a well-dispersed population, residing in small towns and villages in the valleys and highlands. The majority of the population, and hence of activity, is concentrated along the coastal strip, particularly by the bay and the Besaya river basin, surrounding the capital of the region. **Economic indicators** remained negative in 2009, as they did nationally, with GDP shrinking 3.5%. GDP in 2010 was expected to remain in recession and came in 1% below the national average.

Cantabria's economy contracted 1% in the first quarter of 2010 compared with the same period in 2009, and was better than national GDP, which slipped 1.3%. Sectorial growth remained negative in the first quarter of 2010, but the decline was less marked: the primary sector continued to lose ground, the two main branches of activity in Cantabria being livestock farming and fishing. Industry, energy and construction continued to decline. The services sector is the most important in the region and remained fairly stable during 2009. On a positive note, commercial services advanced 1.3% in the first quarter of 2010. GDP per Capita came in at 23,343 euros in 2009, falling neatly between the national average of 22,886 euros and the EU-27 figure (EUR 23,600). Cantabria's Consumer Price Index (CPI) in 2009 was equal to the National annual variation average (-0.3%). The Cantabria's GDP per capita was in 2009 (first estimate) EUR 23,343 which was above the average of Spain (EUR 22,886). Focusing on employment, in 2009 in Cantabria there was 247,600 employed people, that means 56.8% of Activity Rate and the Unemployment Rate was 12.0%

Santander, capital of Cantabria: is located on the north of central Cantabria, bordered by a beautiful bay. It is an active city with an important port. The 32% of the Cantabria's population is located in Santander. It means 182,700 residents (84,984 men and 97,716 women, respectively 49.7% and 50.9%), according to ICANE. The two biggest cities after



Photo of Santander's Bay

Santander are Torrelavega (with 55,947 residents in 2009) and Castro-Urdiales (31,670 people in 2009). The Tertiary sector is the main economic area, actually Service Sector in Santander employs more than 70% of the population. Because Santander concentrates such a high percentage of the total employment of the region, it also hosts the highest percentage of immigrants in the region (41% which means 15,641 people). The services and commercial activities are the economic basis of the city. The industry and construction employs only the 22.7% of the active population (according to the number of workers registered at the Social Security). At the other extreme, the agriculture and livestock means only the 1% of the employed people.

II. Brief description of main characteristics of SMEs and their investment in innovation and new technologies in the country and region (number of SMEs, number of micro enterprises, evolution of those numbers in the last years –creation or not of enterprises-, investment on innovation by sector, new technologies more commonly used in SMEs and rate of use if possible, etc...)

Number of active Companies

	01/01/2009	Interannual variation %
Total	3,355,830	-1.9
Industry	243,729	-0.8
Construction	441,956	-11.8
Trade	830,911	-1.5
Rest of services	1,839,234	0.4

Source: INE

According to the latest update of the Central Companies Directory - CCD (2009), the number of active companies decreased 1.9% during 2008, standing at 3.35 million. The variation was particularly significant in the construction sector (which decreased 11.8%), but barely perceptible in the rest of services sector (0.4%), which in turn, accounted for 54.8% of the total. Cataluña, Madrid and Andalucía account for almost

half of the companies (49.0% of the total). Among the active companies, 52.7% of them did not have employees, 27.4% companies had from 1 to 2 workers, 9.9% had from 3 to 5 employees and just 2.5% of the companies had 20 or more employees (INE, January 2009). Representativeness of the **labor force**³: while Small businesses represent 94.5% of Spanish businesses; these companies only represent around 26.5% of workers in the country. In general, the labor force is distributed relatively equally among the four types of companies classified by the number of workers.

Technology: domestic expenditure on R&D reached 14,701.4 euros in 2008, representing 1.35% of Spanish GDP, with a 10.2% increase as compared with 2007 (Statistics on R&D Activities Report). The Public Administration financed 45.6% of total expenditure on R&D, while the private sector financed 45.0%. In 2008, expenditure on technological innovation grew 10.1%, reaching EUR 19,919 million, as is reflected in the Technological Innovation in Companies Survey. 34.8% of Spanish companies with 10 or more employees were innovative, including technological

Total Internal expenditure on R&D activities, 2008

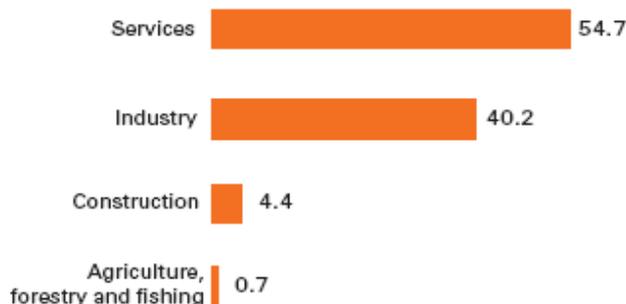
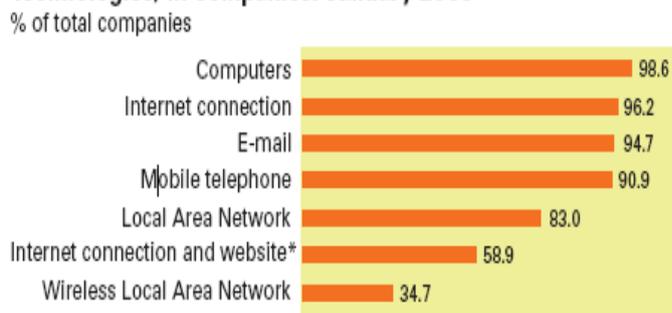
Field of operation	Millions of euros	%	R&D expenditure (% of GDP)	Annual growth rate %
Total	14,701.4	100.0	1.35	10.0
Companies and PNPI*	8,096.7	55.1	0.74	8.3
Higher education	3,932.4	26.7	0.36	11.8
Public Administration	2,672.3	18.2	0.25	13.8

*Private Non-Profit Institutions

Source: INE

innovations, and for the first time, also including non-technological (organisational and commercialisation) innovations. The following graphics show the investment in R&D made in each sector and which are the most used ICT among the Spanish companies:

³ According to the Ministry of Industry, Tourism and Trade in its report "Information Technology and Communications in Spanish SMEs and large companies, 2010" says: "In the calculation of the labor force is not included the members of the company who are not employees, it means: partners, microenterprises owners and self-employed are not included in the calculation, since if they are considered, the percentage of workers for microenterprises would rise".

Technological Innovation expenses, by activity sector. 2008 (%)

Use of different ICT (Information and Communication Technologies) in companies. January 2009


Source: INE * % of total companies with an Internet connection

Cantabria's business structure is fairly fragmented, with 80% of enterprises employing fewer than 6 workers and only 1.5% having more than 50 staff. Retail, construction, corporate services, hotels and restaurants, real estate, land transport, wholesale, health, personal care, education, vehicle sales and maintenance are the main business activities in the region, accounting for 84% of employment. Regarding R&D in 2008, Cantabria was one of the Autonomous Communities that invested between 1.0% and 1.5% of its regional GDP. According to DIRCE⁴, Cantabria has 39,516 companies and like the rest of Spain, the business structure is predominantly represented by SMEs, with 99.91% of all enterprises. However, the Cantabrian SMEs only represent 1.18% of the national total. Its corporate structure is basically formed by micro enterprises (from 0 to 9 employees) which accounted for 94.74% of the total. Regarding the evolution of companies between 2007 and 2008, there was a net decrease of companies (-811 companies, of which -809 were SMEs), in the same period, only companies without employees⁵ increased (+118). Concerning the sectors that companies belong to, the number of them has also declined in all sectors, especially in the construction sector (-597 companies).

The following table summarizes the National and Cantabria total number of companies according to the type of SMEs and the equivalence in percentages. It also shows the total variation of Cantabria companies from 2009 to 2010.

Distribution of Spanish national and Cantabria's Companies, according to their SIZE at 1 January, 2009						
Type of companies	Micro Enterprise		Small	Medium	Total SME	Total N ^o companies
Number of workers	0	1-9	10-49	50-249	0-249	
Spain	1,765,779	1,400,520	156,732	23,872	3,346,903	3,350,972
Percentage (%)	52.69	41.79	4.68	0.71	99.88	100.00
Cantabria	19,740	17,701	1,784	257	39,482	39,516
Percentage (%)	49.95	44.79	4.51	0.65	99.91	100.00
Total Variation of companies in comparison with the previous year	118	-754	-153	-20	-809	

Source: DIRCE, 2010

⁴ DIRCE (Directorio Central de Empresas), Central Business Directory, compiled by the National Statistics Institute (INE)

⁵ Note: According to the mentioned reports self-employees (called in Spanish 'Autónomos') are not considered workers

PART 1: INNOVATION AND HUMAN RESOURCES (MAX. 15 PAGES)

III. INTRODUCTION: THE CONCEPT OF INNOVATION AND ITS FUNCTION IN BUSINESS DEVELOPMENT.

1. National reports related to innovation in SMEs in a wide sense

According to the COTEC Director⁶, during the Sixth Congress of Economy of Navarre, innovation can be considered as "change that creates value", however he also clarify that this definition is too general, so he emphasizes that innovation is "all change based on the knowledge that creates value for the company", and adds that "innovation is the result of a complex process that brings new ideas to market in the form of products or services, and in the production processes or supply, that are new or significantly improved". He also mentioned that there are basically 3 types of ideas/innovations that generate value: commercial, managerial or organizational and technological.

For the definition of innovation, he refers to the third edition of the Oslo Manual (1997), that says "innovation is to use the knowledge and generate it if necessary, to create products, services or processes that are new to the enterprise, or improve existing ones, thereby achieving success in the market", and also mentioned the revision of the Oslo Manual 2005 (which already addresses non-technological innovations), which states that "innovation is the implementation of a product, process or service new or significantly improved, and it is also a new commercialization method, a new method of organization for doing business or a new form of external relations". The Manual also includes the 3 types of innovations discussed above, and clarifies that it is innovation "even if it is just new to the company that carried out (and not to the market)". Although during his speech, he refers to innovation as a concept that includes more than just technological improvements. He finally justifies that technological innovations are the most studied and received more resources from the public Administration since "many studies have shown that they are the ones that generate more benefits and they are not only the cause of better performance in the company's offer but also they are more difficult to imitate and therefore remain longer on the market as a novelty".

On the other hand, according to the DGPYME⁷ report (2005), in its definition of innovation also makes reference to the definition of innovation proposed by the OECD through Oslo Manual (1996), as regards innovation as "the successful implementation of a new product or process innovation (radical innovation) or significantly improved (incremental innovation) in the market or in the company." According to DGPYME, basic concepts are carried out "generally by universities and technological institutes, while companies, particularly smaller ones, focus on the application

⁶ Juan Mulet Meliá, Director of COTEC, Foundation for Technological Innovation

⁷ DGPYME (Dirección General de Política de la PYME), General Directorate of SME: "Business innovation in Spain"

and placing on the market." Hence it is easy to deduce that the collaboration between them is very important and necessary. The following table summarizes the different criteria for classifying innovation according to DGPYME (2005):

Depending on:	Type	Characteristics
Object	By Product	It refers to a good or service
	By Process	It involves changes in the production function in areas such as equipment, human resources or working methods, etc.
Origin	May derive from R&D	a. Own R&D
		b. Acquired R&D
	Dissemination of knowledge by incorporating it in the markets	
	Come simply from experience	
		Imitation
Field	Technological	
	Organizational	Applicable to business practices of the company, the workplace organization or to external relations.
	Marketing/company design	It refers to the design or product packaging, pricing strategy, changes in the way of promotion or sales channels.
Importance	Radical	It allows to achieve and sustain a leadership position, but entails higher costs and uncertainty about its success
	Incremental	Normally, by imitation it can be improved the relative position of the company without incurring excessive risk and costs, hence this is the most commonly followed by SMEs

Source: Personal Compilation based on DGPYME, 2005

In June 2008, the DGPYME prepared the report "The factors of innovation in all of R&D and innovation", which defines innovation and R&D as essential activities to ensure companies competitiveness, understood as the ability to improve over time the market share and/or benefits in an increasingly wider and more liberalized environment. The report was based on data from the Survey on Technological Innovation in business, which stated that "technological innovations include products (goods and services) and new technological processes and significant technological improvements of them". According to this survey, it is innovation when it has been introduced a new product in the market, or the innovation has been incorporated into the production process (product or process innovation); or it also includes a new process or improved process used to manufacture goods or provide services that compete in the market.

In other words, innovative activity belongs essentially to a business environment, since it is a market-oriented activity. According to the report, there are seven activities that take to the development and introduction of technological innovations, and that they could be grouped into two main groups:

Research, Development & Innovation (R&D+i)
Scientific research activities and technological development, correspond to "R&D" component
<ul style="list-style-type: none"> • Scientific research and technological development (R&D internal) • Acquisition of the R&D (R&D external)
Innovative activity, correspond to the component "i"
<ul style="list-style-type: none"> • Acquisition of machinery and equipment related to products and processes which are technologically new or improved • Acquisition of intangible technology (patents, licenses, utility models, software, etc.) • Industrial engineering and design (plans, drawings of new products and processes improved, changes in processes, quality control, experimental production, new production, etc.) • Training related to the introduction/development of innovation (product and process new/improved) • Introduction/commercialization of innovations in the market (market research, product adaptation to different markets, marketing of new product launches, etc.)

Source: Personal Compilation based on DGPYME, 2008.

It is interesting to notice from the table above, how innovative activity is understood in Spain, hence I+D+i - in Spanish - (R&D+i) is a terminology used just in the Spanish territory. With this definition of technological innovation companies can reach an important role in this area without necessarily carrying out R&D (which are only one part of the innovative activity, anyway). However, it is also interesting to point, that even all the reports from organizations in charge of developing RDI, which are backed by National and Public Funds/organizations, refer to the 'i' component as an important aspect of the RDI, they still related that component with technology.

Even, almost all the Spanish reports about R&D and innovation refers to the reports published by the European Union and/or the OECD where is already mentioned the 'social innovation' as an important part of RDI. So, little by little, the concept starts to be used in those national reports. For instance, the report of the DGPYME (2005), in 'innovation processes' includes changes in human resource management and working methods, and also relates to organizational innovation, which is applicable to management of the company in general, the organization of the workplace or external relations. Perhaps the study that most clearly speaks of non-technological innovation is from FECYT⁸ (2010), this report echoes from different authors (Nelson, Teece, among others) who have underlined the need for a complete integration of the technologies 'physical' and 'social' in the micro and macro levels. The study emphasizes the need to include 'complementary assets', which include various non-technological aspects.

⁸ FECYT, Fundación Española para la Ciencia y Tecnología (Spanish Foundation for Science and Technology)



However, the report of the DGPYME (2008) based on the 'Survey on Technological Innovation in Business'⁹, gives us the pattern of what is the road taken from the Spanish Government. On one hand it says that "innovative process involves all kinds of organizational activities, financial and trade as well as science and technology". On the other hand, when talking about RDI, and especially about the component of the 'innovation', it does not mention clearly the organizational activities of human resource management, although we could take it for granted. This could be due to the priority that from 2006-2007, the Spanish government has given to the different branches of RDI, to be discussed later.

Even that the Spanish Government has not added yet in the Public Policies a real framework for social innovation. There are already many actors from the private sector sometimes backed for the academic sector (or vice versa), or independently that include in their speeches the important involvement of human resources when talking about innovation. For instance, Igor Calzada¹⁰, in a article published in 2008, said that "Innovation is a value that should have an impact, provoke and mobilize the human assets, able to act in different human interaction areas as diverse as organizations, companies, institutions, universities, neighborhoods, schools, towns, counties,...due to innovation is applicable to any human activity that has as its ultimate goal, the benefits direct or indirect which should be to the benefit of the entire local community (micro level) and society (macro level). So he described as a second generation of innovation, the Social Innovation, which complements the first generation that could be defined as technological innovation. Social Innovation seeks to achieve three main objectives: (1) sustainable economic development, (2) social cohesion and (3) democratization of culture.

Also, Montse Ventosa, CEO of Great Place to Work Institute-Spain, said during the last of the CSR Benchmarking Days held by the Sustainability Excellence Club in PortAventura (Catalonia, 2008) that management and leadership of people is the 'key' of Corporate Social Responsibility of companies. It should be also mentioned that the ranking produced by the Institute each year responding to natural 'competitiveness' of the companies - as with people - to be on the list, and improve. Its goal it is creating a world and a better society through better places to work. This international list is made in Spain, too. It is the result of the analysis of companies that want to participate, and especially the anonymous view of workers - 2/3 of the results are based on employees 'opinions reflected in questionnaires', since the company may be doing much in this direction, but not doing anything if the employees do not perceive it (according to Ventosa). The list for SMEs (in this case, companies from 20 to 49 employees) is going to be published for the first

⁹ The "Survey on Technological Innovation in Business" is produced by the INE since 2002, it is coordinated with the Statistics on R&D activities at two levels. The sample includes companies that have R&D (exhaustively analyzed), and those that do not carry out R&D (analyzed by sampling).

¹⁰ Igor Calzada, PhD. Project Director, Lecturer and Researcher at Mondragon University, Basque Country. Article published by Diario Noticias de Gipuzcoa (2008): <http://www.igorcalzada.com/innovacion>

time in November 2011 in Spain and it is a good point of reference of what companies are taking care currently regarding their human resources.

2. Benefits for the enterprises and their environment that appear in those reports.

Innovation is crucial for long-term economic growth of a country, its stimulus to productivity and competitiveness of enterprises, which is reflected in lower prices for final goods and services offered by companies. Likewise, innovations in one sector indirectly increase the productivity of other sectors. Entrepreneurship and innovation are integral elements in achieving a common goal – economic growth and competitiveness (IPREG 2007).

The economic results are better for innovative companies. In general, it is confirmed that the differences between innovating and not innovating are more pronounced in the group of SMEs than in large companies. At the firm level, innovation can lead to improvements in quality or greater product differentiation, allowing them to increase their value added, which also has a positive effect on employment. Although at first the innovation process produces a saving of work required per unit of output, the net effect on employment can be positive if the increased demand caused by price reductions promoted by the cost reduction is sufficient. Product innovation, especially if it is radical and occurs in the early stages of their life cycle, increases the demand for it, encouraging the creation of employment, provided that the demand for substitute products do not look too concerned. In these cases temporary imbalances can occur in employment, due to the inadequacy of profiles of workers to the new requirements, hence the continuing professional training that much. Moreover, economic growth resulting from innovation generates an increase in national income, which increases investment, thereby promoting wealth creation. This increase in wealth will in turn increase the competitiveness of enterprises. Similarly, when companies use innovation to improve or produce new goods and services increases consumer satisfaction and increases overall welfare.

Internal R&D competencies of a company are important for innovation generation activity. As a company increases its efforts in developing internal R&D activity, the more likely it will be able to generate innovative products. Hence R&D intensity is expected to be positively correlated with knowledge contained in innovation outputs. Moreover, R&D partnership is also seen as a key factor for industry to respond to the increasing technology demand and to face competitors' fast technological growth. Companies innovate to go to provide products, processes or services with better performance and, as a result, produce fewer resources that will get more benefit, or because consumers are willing to pay a higher price for the product or innovative service to offset the higher unit costs of the factors, or both. That is why today's innovation is a very important concept to understand the functioning of the economy.



IV. INNOVATION IN THE ENTERPRISE

1. System of innovation. Actors and relationship among them

How is innovation understood by each of these actors and how do they try (each one) to improve it?

- **SMEs:**

In the past 15 years, Spanish firms, especially SMEs, have improved their real value above the European average, indicators of entrepreneurship are fairly consistent with the position of Spain in the current development cycle. However, Spanish productivity characterized by low growth in turnover and employment, has increased much less (almost half) than the European average, becoming one of the main problems for Spanish companies. With respect to conduct R&D and innovation and the introduction of innovations in all sectors of production, product innovations are more frequent among SMEs, while the process highlighted in the group of large companies. From the point of view of protection of knowledge is significant that in those sectors with a more mature technology profile is counted a higher percentage of innovative firms that patent.

Setting the goal of "Europe 2020" (IPYME, 2010), based on smart growth, sustainable and inclusive, Spanish companies are aware that it is increasingly necessary to bet on a new model more competitive as a source of development companies. In the current economic climate, influenced by the globalization of knowledge speaks of the high-growth SMEs or *GAZELLE* model (which are the companies that increase national employment, take more risks than their competitors and launch new products, opting for innovation as a source of improvement). Governments in many countries (in Spain, too) have included the pursuit of *GAZELLES companies* as a priority model measures designed to encourage business creation and improvement of existing tissue.

On the other hand, there are already SME's that include in their business strategy innovative tools and policies regarding human resources, some of them are Gazelles companies, the SME include in the Great Place to Work list, among others. Although, they do not specifically include those policies as part of innovation policies, actually it seems they do it as something independent that just concerns HR Department, in other words, not really as a part of their whole strategy business.

In Cantabria was created in 1984, the University-Enterprise Center, through a collaboration agreement between the Chamber of Commerce of Cantabria and University of Cantabria (UNICAN), which had among its objectives: research, training, guidance employment, information and collaboration between companies and universities. Through this foundation has channeled aid to various projects and increased collaboration between companies in the region and UNICAN, the University-Industry Centre belongs to the Spanish Network of University-Enterprise Foundations (REDFUE), which currently comprises 29 entities, with presence in 17 regions and over 1000 organizations among which are companies, associations, financial institutions, chambers of commerce and local government entities and regional levels. The main areas of activity are

included in the programs of innovation and technology transfer, support for entrepreneurship, and specialized postgraduate training and guidance and employability.

- **Universities:**

In recent years, both business-building programs and extra-curricular initiatives, such as formal education initiatives in Spanish universities have experienced significant growth. In the framework of the activities of universities are settled initiatives for enterprise creation and promotion of entrepreneurship, albeit with varying degrees of development and depth among public universities and/or private. Also, take note that there is a greater number of extracurricular programs and initiatives than formal studies initiatives, according to DGPYME (2006) university initiatives to promote innovation and entrepreneur character can be divided into 2 areas:

- Programs and extra-curricular initiatives: Most of the programs were originated from 2000-2005 and were based on the experiences of the university or other organizations with proven success in the field. Most programs were general (more than half were oriented toward technology-based companies) without addressing a specific business sector and led to a wider target audience. When programs were targeted to a specific group, they were dominated for researchers and doctoral students.
- Official studies initiatives: These initiatives, especially, aimed to encourage entrepreneurship among students and to introduce business-building techniques, especially in the areas of Economics and Business. However, in recent years there has been a greater presence in other fields such as Technology, Social Sciences or Health Sciences.

Spin-offs from universities have been supported by Centre for Industrial Technology Development (CDTI) but also by many regional development agencies (IPREG 2007). There have also been reforms and mergers in the university system to encourage, for instance, an increase in the number of business-orientated PhDs. Some regulatory reforms at universities aimed at fostering cooperation by, for instance, allowing public university professors to take up to a five-year sabbatical to launch a company based on technological innovation.

In Cantabria, as a result of the actions of the University in the business world, was built in 1999, the Technological Development Center of the University of Cantabria (CDTUC), becoming the first science park technology in the region, which promotes collaboration university-industry and transfer of research results of groups R&D and innovation. This innovative space facilitates the settlement of new technology-based companies and contributes to technological development in Cantabria, support businesses conducting R&D and collaborating with university departments. Its facilities, currently hosting a total of 17 companies, 2 regional centers support the business sector (GIRA and CTC) and seven research groups attached to multiple areas of knowledge. CDTUC is managed by the Leonardo Torres Quevedo Foundation (owned by the University of Cantabria) and was funded by the FEDER.

- **Public Administration**

Many of the actors concerned with entrepreneurship activities are also involved in innovation policy. Indeed, while many of these actors focus on one or other of the areas, they are still key players in the other. Competitiveness and Employment are both key areas in the main policy document drawn up by the Spanish Government, the National Reform Plan. At National level, after the Spanish general elections of March 2008 the Ministry of Science and Innovation (MICINN) was created. It arose as an alternative to the slow progress of the RDI¹¹ system experienced in the last few years.

Apart from the Ministry of Science and Innovation, there are also three ministries that maintain their roles in RDI: Ministry of Industry, Tourism and Trade that proposes and puts into practice R&D policies regarding industrial development, trade, energy, SMEs, tourism, telecommunications and the information society; Ministry of Defence which continues playing a role in RDI policies in the field of national security; and the Ministry of Public Works which is responsible for the R&D policies in civil engineering technologies, edification and the associated environment (INNO-Policy, 2009).

There are also three main bodies in Spain which take control of managing implementation of RDI (Innovation Policy Progress Report, 2009):

- a) Inter-ministerial Commission on Science and Technology (CICYT), structured as a working group of different ministries. The CICYT is supported by the General Council of Science and Technology (which coordinates relationships among Autonomous Regions, as well as between the Autonomous Regions and the central administration) and the Advisory Council for Science and Technology (which promotes the participation of the scientific, economic and social community in the development, monitoring and assessment of the National Plan).
- b) Spanish Fund for Science and Technology (FECYT, in Spanish) is the main integration instrument of the ministerial activity.
- c) The Centre for Industrial Technology Development (CDTI) is a public entrepreneurial entity, dependent on the Ministry of Science and Innovation, which promotes the innovation and the technological development of Spanish enterprises.

Moreover, the Spanish innovation policy making and delivery structures cannot be understood without considering the regional governments of Spanish Autonomous Communities. Although the Spanish government is the main actor in innovation policy, there is a decentralisation that increases the complexity of the Spanish Innovation system due to the devolution of responsibilities and funding to the regional authorities, among the 17 Autonomous Communities there are some dominant Regional Innovation Systems (RIS). Additionally, the National RDI Plan 2008-11, designed and managed at a national level, has explicitly included coordination between the central and regional governments in the RDI cooperation area as one of its main objectives. Although the top

¹¹ RDI (we will use from now on), Research, Development and Innovation the equivalent of Spanish I+D+i

level in terms of legal setting and funding is managed through the national governance, at regional level there are implemented local plans managed on their own, continually interacting with the national system, though.

The competences in innovation policy are the same in all regions and include regional development policy, technological and scientific parks, research centers, technological centers, planning and implementing the management of the EU Structural Funds (SFs), Innovation Relay Centers and organisations for the transfer of technology and raising public awareness of technology.

The new Spanish strategy for RDI (Cajamar, 2008), essentially recognizes four main instruments: a) to support the creation of Consortiums of large companies to enable industrial processes to the market research, which is part of the CENIT program (National Strategic Consortiums for Technical Research), b) the widespread support to RDI through tax deduction for companies; c) redefinition of the policies of support for companies promoting the strategy based on the empowerment of gazelles companies, and d) support the strategy aimed at business groups such industrial parks or clusters.

Additionally, Spain in line with the Lisbon Strategy¹² (2000 - 2010) developed in 2005, for the mid-term review of the initiative, a National Reform Programme (NRP, 2005-2008). According to this European framework, the Spanish NRP focused its activity in the supply side of the economy, and grouped it into three areas: environment (macroeconomic, fiscal and business); markets (labor, goods and services); Productive factors (physical capital, technological and human). From this base, seven axes were defined (Mulas Granados, 2007):

- Strengthening macroeconomic stability and budget
- Strategic Plan for Infrastructure and Transport (PEIT) and the AGUA program
- Increasing and enhancing human capital
- Strategy for RDI (INGENIO 2010)
- More competition, better regulation, efficiency and competitiveness
- Labour market and social dialogue
- Business Plan Development

The government decided to put more emphasis as a key tool for increasing productivity in the medium term, so focus on the 'strategy for RDI' through the INGENIO 2010 Program, which set a series of objectives and programs among which are:

a) CENIT program (National Strategic Consortiums for Technological Research) to stimulate collaboration in RDI between companies, universities, agencies and public research, science and technological parks and technological centers. In turn, the CENIT program also has these actions: CENIT Projects, Fund of Funds and Torres Quevedo Program.

¹² The Lisbon Strategy was launched at the European Council in Lisbon in 2000. The strategy was designed based on three pillars: economic, social and environmental.

- b) CONSOLIDER program to increase the critical mass and research excellence, through the Consolider projects, CIBER Projects, I3 Programme and the Strategic Fund for Scientific and Technological Infrastructure.
- c) AVANZA program to converge with Europe in the main indicators of Information Society in households, companies and Public Institutions
- d) And a new system of policy monitoring and evaluation for RDI through the new Integrated Monitoring and Evaluation System (SISE).

- **Other actors:**

The strategies for business innovation in Spain, have involved, to a greater or lesser degree, national and regional governments, companies and universities, as well as local authorities, industry associations, employers, unions, agencies, research and technology transfer structures, incubators for technological companies parks, and financial institutions such as banks and savings banks, venture capital funds, financial markets, among others.

- **What and how is the relationship among them (if any) in your country / region?**

As mentioned in the previous section, Spain has developed and implemented policies for cooperation between universities, government and SMEs, all in accordance with the framework for EU action. Likewise, at regional level, the Autonomous Communities have also done the same, always in reference to the national policies. In turn, actors such as Universities, Chambers of Commerce and associations, together with public institutions, regional and local authorities have developed and implemented their own initiatives to find a development and implementation of business innovation.

2. Diagnosis of innovation in SMEs (in general and by department)

Statistical data information (from academics and Government) is not much available especially regarding two issues: first, the situation of innovation of Micro-enterprises (from 0 to 9 employees which represent the 94.48% of companies in Spain) for both areas, technological and human resources. Second, the scarce availability of deep statistical information concerning the situation of human resources considered as innovation, for both Micro-enterprises and SME. So, to give a diagnosis of situation of innovation in Spain, we have included in the first part, the findings of 2 research of innovation concerning human resources since they summarize in a comprehensive way the situation of SME and they are also complementary (one, mainly reflects the opinion of HR managers and the other one, reflects employees' opinion, SME data is not disaggregated in any of them). In the second part (about ICT use) the data from 3 national reports was taken, since one focus on Micro-enterprises, another one on SME and the last one give overall national information.

2. a. Situation of innovation (not just new technologies) in SMEs

Human Resources situation

According to Cranfield Report (ESADE 2006), by 2006 Spanish companies gave little importance to Human Resources Departments in the planning strategy of companies. Although HR managers have a prominent role in the area of training and development, they also believe that challenges must be faced such as strategic alignment of culture, work environment /motivation /productivity, recruitment and selection, which reflect the need to attract management talent.

On the other hand, in 2008, the Adecco Institute funded a survey of 2,500 companies of all sizes and sectors of the European Big Five economies (Germany, United Kingdom, Italy, France and Spain). This report provides relevant information, although it was designed to examine the measures that companies have implemented or plan to do it, taking into account demographic changes that their respective countries and the EU as a whole will suffer in the coming years. So, in this part we have chosen to include the data from the White Paper of Demographic Fitness Survey¹³ that revealed how Human Resources managers were reacting to current economic developments and crises. Many of the actions summarized in this WP are supposed 'luxury' programmes, so long-term employee development often is the first to be scaled back. Then, when an upturn comes, the awakening can be quite painful, as the report said "human resources are insufficient and not always up to the challenge". Adecco developed the DFX¹⁴ score, an aggregate indicator, summarizing how prepared European companies are on the basis of the 5 pillars of strategic Human Resources Management, that is:

1. **Career Management (CM):** Of the nine main career management tools cited in the survey, Spanish companies, on average, offered 3.3, indicating that retain key resources and prevent the loss of talent played a minor role for them in 2008. For instance, 'Creation of entirely new positions' plans represent only 22%, but 'internal career consulting' are quite popular, with a share of 71%. Specifically, the study reveals that few companies offered a wide enough range of tools for professional development
2. **Lifelong learning (LLL):** The continual updating and acquisition of new skills is a second key determinant of both individual employability and corporate growth. In European companies, specific tools of LLL are introduced and implemented comparatively well with 4.2 out of 8 (in Spain is 4.0). While it is true that companies offer training and about half of its employees make use of it. However, it is usually standard training, made in the workplace, which focuses more on the certificates than in individualized programs or interpersonal skills. EU companies provide an average of 6.5 training days per employee per year. Spain is above average, remain the most generous to 8.7 days.

¹³ European Demographic Fitness Survey 2008: "Demographic Fitness of Companies in Rough Economic Waters" http://institute.adecco.com/Research/Articles/Pages/DFX2008_EU.aspx

¹⁴ Adecco Institute, evaluated according to a certain indicators. The results were plotted at a rate of 100 to 400 points (Demographic Fitness Index, DFX). The DFX draws on the individual scores of companies, calculates indices and follows an overall score for the EU.

3. **Knowledge management (KM):** It has been implemented the basic tools of knowledge management and companies know the level of technical expertise needed for the jobs. However, few companies have comprehensively assessed the risks of loss of knowledge when a particular employee leaves the company, so they do not know which employees have critical business information or who really experts that they can relay on.
4. **Health management (HM):** has not been a managerial issue in Europe to date, but health issues are becoming more important as population ageing progresses, and also due to the latest law regarding the increasing retirement age. Thus, firms better at handling them will enjoy a competitive advantage in coping with demographic change. Few companies adopt more extensive programs than basic compulsory or classical ('medical check-up at work') to provide health tools with long-term effects that help, for example, to combat stress or to give advice on lifestyles and healthy diets (more 'modern' and more preventive measures). For instance, 'relaxation programmes' with a share ranging from a negligible 4% in Spain up to 9% as average of the Big Five.
5. **Diversity management:** recognizes the necessity of creating a work environment that values each individual's contribution – regardless of age or rank. European companies provide an average of 4.6 out of 11 tools in diversity management areas such as equal opportunity for all age groups and age-neutral job advertisements and appointments – areas that typically are protected by law. While a great majority of companies comply with legal requirements regarding age diversity, and formally treat all age groups equally, no many of them carry out complementary programs to promote a dynamic culture of mutual appreciation, guidance and knowledge sharing.

The table below summarizes the 5 management tools of Demographic Fitness and the specific measures of each one, cited in the survey and corresponding to just Spanish companies, 2008:

FIVE FIELDS OF ACTION OF 'DEMOGRAPHIC FITNESS' 2008

CM	3.3 (of 9)	LLL	4.0 (of 8)	KN	4.6 (of 12)	HM	3.4 (of 9)	DM	4.2 (of 11)
Average no. of tools offered	%	Average no. of tools offered	%	Average no. of tools offered	%	Average no. of tools offered		Average no. of tools offered	%
Work life plans	39	Analysis of individual training requirements/ regular discussions	64	Management Information Systems	66	Company sports facilities	17	Age neutral job advertisements	77
Change of profession / career path	26	Workplace based training initiatives	75	Customer Relationship Management Systems	50	Back strain reduction	19	Age neutral appointments	59
Creation of entirely new positions	22	Internal training initiatives outside the workplace	59	Internal online forums	28	Relaxation programmes	4	Equal opportunities for all age groups	88
High potential Programmes	25	Advanced training initiatives from external providers	48	Publication of knowledge holders in an internal "Yellow Pages"	19	Healthfully catering	25	Performance orientated payment system	41
Mentoring programmes	30	Encouragement through individual attention/advice	47	Building mixed age teams	39	Dietary advice	17	Junior-/Senior Round Table	11
Coaching programmes	35	Schemes for imparting technical skills	49	Standardised records of business critical knowledge	34	Medical checkup at work	54	Age heterogeneous working groups	43
Internal career consulting	71	Schemes for imparting methodological skills	34	Targeted advanced training programme for renewal of knowledge	51	Pre - employment medical checkup	87	Age homogeneous working groups	17
External career consulting	37	Schemes for imparting social skills	25	Use of external consultants	60	Regular health checks	76	Teambuilding seminars	21
Individual career Programmes	42			Cooperation with other companies	46	Health advice/ medical consultation	36	Platforms for exchange between employees	20
				Cooperation with colleges and other institutions	45			Mentoring programmes	35
				Establishing own think tanks	12			Awareness raising workshops for managers on the subject of age diversity	5
				Contact with external think tanks	8				

Source: Personal Compilation based on ADECCO, 'Demographic Fitness Survey', 2008

As we mention at the beginning of this section, we include here the data from **Great Place to Work – Spain report**, since it gives complementary information to Demographic Fitness Survey report, and include the point of view of employees.

According to the report of GPW, which publishes a list of the 25 best companies to work in Spain, different categories are included (companies with more than 1000 employees, 500 - 1000 250 - 500, 100 - 250 and 50 to 100), and companies from various sectors, pharmaceuticals, ICT and financial sectors are the most represented on the list. The list is based on an extensive survey of work environment made to employees. This survey accounts for two thirds of the score, the rest is provided by an internal audit practices and policies of HR Department of each company. The employee survey is anonymous and examines employees' relationship with managers, colleagues and the own company. It is focused on five areas: credibility, respect, fairness, pride and camaraderie.

The GPW 2010 report revealed that foreign multinationals and technological firms take more care of their workers. The report outputs reflect that 73% of respondents felt that their working hours can be flexible when needed (this is one of the most determining factors when signing a contract, joining to the potential for career development, and not just the salary as it used to be). So now, companies tend to meet the needs of each worker, customizing business practices, and among the 25 Spanish companies in the ranking there are common practices such as flexitime, continuous working day, paternity leave, tickets restaurant or discounts for food, training support, suggestion box, events to promote a good work atmosphere and sports facilities. Another level of measures that are emerging in some top firms of the list, is the improvement of maternity and paternity leave, flexibility for breastfeeding, support for nursery, teleworking (possibility of working from home also encouraged by ICT's), new ideas bonus, gym subsidy, habituation of a massage room and incentives for volunteer work.

According to the report, there has been a decrease in absenteeism of up to 1.94% (perhaps as a result of the uncertainty of the economic crisis affecting the labor market). On the other hand, the study stressed that Spanish companies are trying to improve their work environments, and that 18 of the 50 companies on the list are Spanish or have Spanish capital. Also shows that 81% of employees of the best companies consider their company as a great place to work and that 76% of employees trust their bosses, while 62% believe that managers fulfill their promises.

In addition, 67% of organizations have used, at least one, training through e-learning techniques. 76% of HR respondents wish to implement e-learning training over the next three years, and only 14% do not expect to make any change thereof. While 94% of HR managers said that investment in e-learning is effective for employee training. Employees believe that investments in training they receive are appropriate (52%), and 21% think they are insufficient, in addition, 33% said their organizations managers receive less training than other employees, compared with 43% who felt that they receive the same training as other employees. Over 80% of the organizations carry

themselves more than 50% of the training for their employees. On the number of training courses held by the organizations, 48% estimated should be growed, and 9% think should be the same. The knowledge among HR managers on the current EU laws on labor is also assessed by this report, showing that there is still a high lack of them, since 67% of these managers do not fully understand the implications of EU labor laws.

Concerning to workplace, 21% of employees stated that their jobs are not a stimulating place where work, 31% said that the design of the offices is outdated, and 75% said that a poor work environment leads to an increase in days of sick leave for employees. Concerning employees' working life, the survey revealed that their employers (33%) expected them to work less than 41 hours per week; while 55% of them expected employees work from 41 to 50 h/w; from 51 to 60 h/w the 10% of employers; and from 61 to 70 h/w the rest of them. Also with regard to barriers that stop employees working from home, it was highlighted the poor communications (41%), the (dis)trust in employees (27%), the cost of the technology (14%) and an inadequate legislation (18%). Nevertheless, 66% of companies of the survey allow employees to work from home.

ICT's situation:

The number of SMEs and large firms in Spain decreased by 12% in 2010 compared to 2009, in the same period, microenterprises decreased 1.4%. Microenterprises in Spain are dominant in most productive sectors, as mentioned before; they represent 94.48%, while small and medium companies accounting for 5.39%, and big companies 0.12% of total Spanish companies (INE 2010).

The statistic data corresponding to this section were taken mainly from 3 sources; the first is based on reports of INE (2008/2009)¹⁵; then for information of the Microenterprises (0 to 9 employees) was taken from Fundetec (2010)¹⁶ that analyzes the technology of nine sectors which account for 42.4% of Spanish GDP - logistics, transportation, hotels, rural tourism, textiles and clothing, retail, crafts, telecommunications infrastructure and food; finally, the Ministry of Industry, Tourism and Trade (2010)¹⁷ report which analyzes companies with 10 or more employees, that is, including SME but not the Microenterprises.

The environment that characterizes ICT changes rapidly, steadily incorporating new ones, which means that to carry out a proper and efficient use of products training for staff is required to use that technology. Overall the percentage of SMEs that offer ICT training to their employees is 13.4% and 10.8% for microenterprises (for large companies, 49.1%). In 2010, 66.3% of microenterprises had **computers**, but with differences among them (0-2 employees, 61.4% and 3-9 employees with a similar percentage to SMEs), and for SMEs 90.1%. The percentage of micro-enterprises with

¹⁵ INE: "Survey on the Use of Information and Communications Technologies and e- Commerce in Companies", 2009

¹⁶ FUNDETEC and DGPYME: "ePyme Report 2010: Sectorial Analysis of Implementation of ICT in Spanish SMEs", 2010

¹⁷ Ministry of Industry, Tourism and Trade: "Information Technology and Communications in SMEs and large Spanish companies", 2010

Internet connection was 55.9% in 2010, and 96.2% for SME's, among these companies, 58.9% had website. Companies have discovered the **social networks** in 2010 as a new channel to reach customers, and some sectors are beginning to make heavy use of them. **Electronic commerce** still does not reach a majority implantation among micro and SMEs. About 59% of SMEs with Internet have their own **website**, both micro and SMEs use mainly their web sites for: the presentation of the company (90%), the access to product catalogs and price lists (56.1%), and for the privacy policy statement or certificate (45.1%).

In 2008, 20.3% of SME's made purchases using electronic commerce, and it was among travel agencies and tour operators where this percentage was the highest (57.5%). Enterprises engaged in the sale and repair of vehicles have the higher percentage in purchasing by e-commerce (52.1%); 11.1% of companies sold using this electronic way, with the figure reaching 67.9% in the case of accommodation services. The percentage of **mobile phone** use increased to 66.3%, while for SME's reached 90.9%. The percentage of microenterprises with access to **wireless broadband** Internet was 22.6% and for SMEs 93.8%. Among those 94.7% have e-mail. On the other hand, the **extranet** and **intranet** are only present in 15% of SMEs, although there is a growth of local networks, including wireless, over other technologies (broadband, Internet access ...).

Computer Applications considered as ICT innovation: the **office software**, followed by **billing** and **accounting** applications. Technologies associated with mobility and specific applications with the ability to provide greater value to the business were the great protagonists in 2010. For instance, new mobile devices like Smartphones and Tablet PCs, among others. **Software Security**, the percentage of SMEs and large companies that have had a security problem last year, has stabilized at 12.6%. Regardless of company size, the main problem is the computer virus attack, worm or Trojan, affecting 12.1% of companies with Internet. Measures against such problems are a priority for almost all the companies (97%), which incorporate software antivirus protection or screening. The **backup of data** or the secure server are the least used. SME's use **automated data exchange with external ICT systems**¹⁸ (36.7%) for: sending payment instructions to banks (75%), exchange of information with the Administration (60%), sending or receiving information about products (57.4%) sending or receiving information about transportation and receipt of electronic invoices (40%), sending electronic invoices, sending purchase orders and receiving orders from customers are around 20%. **ERP**¹⁹ **Tools** are presented in 19.1% of the companies. While overall **CRM**²⁰ applications are more common than ERP, in medium companies ERP applications are more common, but in small companies CRM tools are more popular.

¹⁸ Is the exchange of information (i.e.: orders, invoices, etc), via Internet or other telematic networks, in an agreed format that allows automatic processing of it (i.e.: XML4, EDIFACT4...). Manual e-mails are not included.

¹⁹ ERP (Enterprise Resource Planning)

²⁰ CRM (Customer Relationship Management)

Additionally, to complete this part regarding ICT use, we include the following table summarizing the percentages of the main ICT tools in our region, **Cantabria**:

	Computer	Local Area Network (LAN)	"Wireless" LAN	Internet	Intranet	Extranet	e-mail	Website
Cantabria	99.0	70.7	21.6	98.8	18.2	11.6	96.8	55.8

Source: INE. January, 2009

2. b. Main changes faced by SMEs in the last years to be able to innovate

Currently, due to the rapidly changing situation, due to many factors, including increased connectivity and interdependence of the markets, enterprises, the massive use of new technologies, among others, underscore the need for companies to innovate while highlights the inability of companies to conduct their own innovation processes, so it is imperative to relate with others in their environment (at national, regional, local level...), hence the external sources of knowledge are a phenomenon growing.

According to EIT²¹ (2010) which considers the impact of a group of ten barriers to innovation projects of Spanish companies, and how they perceive them, which are related to the following obstacles that companies face: availability of financial resources for innovative projects is even harder for new and small companies, either for lack of experience of the company or by the lack of knowledge about innovative activity by the banks; availability of research staff; the operating environment; the cost of projects; access to information; availability of skilled workers; market characteristics associated with the uncertainty of market dynamics (the cyclical changes in the tastes of the application, entry of new competitors...); intellectual property; training and effort in the workplace; long period of maturation that characterizes innovations

INNOVATION & HUMAN RESOURCES

- **Evolution of the concept: How has Human Resources changed in the last years? New model in Human Resources**

Fashions and trends in all spheres of human activity evolve. Ways of managing care for fashion and trends with sometimes seemingly contradictory arguments. One of the most dynamic areas of companies organization and has evolved into a rhythm 'quasi' frantic is Human Resources. The

²¹ EIT, Encuesta de Innovación Tecnológica (Technological Innovation Survey)

Human Resource Management has reached highly specialized concepts where necessary requirements in the areas of Human Factor require special training and of course have high technological resources. These needs have been through the payroll management, and subsequently by the Personnel Management, after the Human Resource Management and currently by the so-called Knowledge Management. Indeed, the basic function of staff until recently more than 20 years was almost exclusively to the payroll by hand. This evolution has been possible thanks to technology, and it was because companies were for lower costs.

The HR professional is changing from a less administrative role to a more strategic role. HR management has continually proved their effectiveness and their existence. Nowadays, the company's objectives are geared to lower their costs and specialization in the Core Business of the company: be specialized and competitive at lower cost in a very high competitive world. Hence, HR professionals should focus on Strategic Development Consulting and internal company because they are the two aspects which contribute to differential values and produce an improved competitiveness in the market. The outsourcing became one the usual way to help companies to focus on their core activities, and it is a powerful tool for SMEs, but not the only one.

- **Role of human resources in global strategy of the enterprise**

Over the last 20 years, the workplace has changed in more ways that one could have ever imagined, resulting from the increase in technology, innovation and globalization. This new decade will bring even greater change, impacting all facets of the workplace, including major changes for the HR department and HR managers. In order to respond to the demands of organizations, HR managers will require new skills and competencies relating to language and culture, technology capabilities to facilitate overseas communication, methods to measure and quantify effectiveness and evaluate strategies and return on investment. Evidently, these new skills and competencies will result in an emerging new role for HR managers, requiring them to be strategic business partner, supportive of the overall corporate strategy. HR has to involve the whole organization in the changing process and act as a counselor and facilitator.

Different reports stress that measures taken regarding HR management are not based on a trend, but economic realities. A better situation on human resources can mean for companies increased to 20% in terms of competitiveness, innovation and productivity, that is, translate directly into a business success. (Adecco Institute)

- **What have been main problems / challenges faces?**

Issues facing HR are expected to change dramatically in the next decades. Thus, HR professionals must play special roles in dealing with these changes and must develop specific competencies to support these roles. There is a need to view HR as a partner or a business enabler. One of the constant challenges faced in this area is to align HR to business. The five R's therefore, assume of

the utmost significance in HR strategy. The HR team needs to get in right from the stage of defining the business strategy to Resourcing, Recruiting the right talent, Retaining the talent, Retraining and Restructuring.

Another major challenge is how they are going to be incorporated in all the sub-systems in HR and help them in achieving the ultimate goal – exceptional performance. People have to be groomed to get in tune with the performance culture. Creating an environment that stimulates the creation of knowledge and its sustenance throughout the organization is a big challenge. No longer can the HR department carry on with its traditional functions. However, HR Information Systems (HRIS) is to be put in place – to build and sustain a performance – driven culture. The role will shift to that of facilitator.

Workplace flexibility is expected to be on the rise as the future workplace, the ‘virtual office’ is characterized by creative and flexible work arrangements. There will be an increase in emphasis on performance and results as opposed to the number of hours worked. In addition, off-site employees can expect to attend fewer meetings. Specified work will become much more collaborative and management will spend nearly all its time managing cross-functional work teams who enjoy a lot of autonomy. In essence, there will be a movement, a trend towards a decentralized model of HR. HR managers will have to accommodate employees in their virtual work locations and find ways to manage corporate culture, socialization and employee orientation. In order to obtain and maintain a competent workforce, they must act as organizational performance experts and shape employees behavior without face to face meetings.

Another expected change in HR is the ‘Global Business’ concept world trade knew a major growth during the last years and there is forecasted as well the growth of international businesses, especially among small firms. Organization must take into account cultural differences that shape managerial attitudes, when developing multinational management programs. HR managers must therefore be familiar with and understand other cultural norms to promote organization diversity. An organization that recognizes and promotes cultural diversity will benefit because it will be employing the market that it serves. HR professionals will also be responsible for providing cultural sensitivity training for the organizations employees and for managers throughout the entire organization (Czebter, Anamaria, 2002).

- **What is still to be done?**

According to PRO INNO (2009), the Spanish growth in performance in HR is significantly below the EU average. Regarding 'Growth per dimension', Spain has managed to combine above average EU-27 levels of performance and rates of improvement in the following indicators: economic effects, throughputs, firm investment, finance and support and, with a very modest contribution, human resources. Comparing this data with EU information, Spain shows a decline of its performance in

innovators and linkages and entrepreneurs. Considering the current performance of Human Resources indicator, Spain's level is below the EU average level. Although positive results have been achieved in 'Tertiary education' and 'Lifelong learning', the main trend of this indicator is to remain stable. These contradictory results suggest and confirm that Spain has a low public expenditure on education, which in 2006 amounted to 4.28% of the GDP. This means that Spain still has to work hard in different areas and at different levels related with HR regarding the future of its economy and society.

However, it is not just about identifying training needs and giving the required training. It is about foreseeing and anticipating the requirements and developing suitable training so that the employees are well-equipped to handle the challenges. HR has to become partners with the main managers. But also, HR needs to prove that its initiatives and programs are result-oriented, providing specific measurable results in terms of business competitiveness that contribute positively to the bottom-line of the organization.

It will be needed to create organizations capable of attracting and retaining new digital talent. Young people who arrive today for the first time to companies are the Digital Natives who "have values, motivations and expectations radically different", and companies should be able to offer them a new model of leadership if they want to attract and retain their talent. Also, mass collaboration has a dramatic impact on the transparency of the organizations. Similar to what happened with the Internet in the market, transparency in organizations create more flexible and efficient organizations.

NEW ORIENTATIONS IN HUMAN RESOURCES IN THE LAST YEARS AND FOR THE FUTURE (TENDENCIES)

1. Knowledge Management

- a. Generation and enhancement of knowledge
- b. Competence-based management
- c. Lifelong Learning
- d. Building teams
- e. Standardised records of business critical knowledge
- f. Targeted advanced training programme for renewal of knowledge

2. Management by value

- a. Corporate Social Responsibility (CSR)
- b. Reconciling work and family life
- c. Gender Equality in employment
- d. Working time options / flexible working time

3. Other (please specify and describe)

- a. **Design Thinking:** According to IDEO²², “This approach brings together what is desirable from a human point of view with what is technologically feasible and economically viable. It also allows people who aren’t trained as designers use creative tools to solve a vast range of challenges”. It is a deeply human process that taps into abilities that we all have but are overlooked by more conventional problem-solving practices. It relies on our ability to be intuitive, to recognize patterns, to construct ideas that are emotionally meaningful as well as functional, and to express ourselves through means beyond words or symbols. The design thinking process is best thought of as a system of overlapping spaces rather than a sequence of orderly steps. There are three spaces to keep in mind: *inspiration* (problem or opportunity that motivates the search for solutions), *ideation* (process of generating, developing, and testing ideas) and *implementation* (the path that leads from the project stage into people’s lives)

- b. **Outplacement** (Use of external consultants): Is the set of services provided by a consulting firm specialized professionals who must find a new job, to be found, so that meets their expectations in the shortest time possible (Spanish Association of Outplacement Consulting). Divided into 4 blocks, organized by the temporal order: a) psychological and emotional support for overcoming the grief of losing his/her job; b) internal and external analysis of their own capabilities and market opportunities; c) set goals; d) training in professional issues (languages, business management, etc.) and training in job search itself (curriculum, interviews, negotiations, etc).

- c. **Creation of clusters** (Cooperation with other Companies / Cooperation with colleges and other institutions / Establishing own think tanks / Contact with external think tanks). Clusters are a group of businesses, generally in the same economic sector, which share experiences, good practices and act jointly to achieve the most favourable competitive framework for developing their activities. Clusters are based on innovation and cooperation, and the key to their success is achieving a critical mass of resources in the geographical area where they have set up. In this way, three-way collaboration is usually very important: businesses, universities and regional/local authorities.
http://www.madridnetwork.org/red/que_es_cluster/concepto_cluster

- d. **Management culture:** MC is the way a company is managed influenced by the surrounding culture. It is something that has often been developed since the origin and is permeating the company spirit. Examined theories were concentrated into the Management culture model containing five dimensions; Relations, Orientation, Decision-making, Motivation and Loyalty.
http://biblioteca.universia.net/html_bura/ficha/params/id/50853371.html

²² IDEO: <http://www.ideo.com/>

- e. **Organizational Climate:** or corporate climate, is the perception that members of an organization have of the most immediate characteristics that are significant to them. These perceptions influence the organizational behavior (Rodriguez, A, 1999, Rodriguez, D. 1998). The importance of this information is based on the finding that Organizational Climate influences the overt behavior of members through that filter stabilized perceptions of reality and determine the levels of work motivation and job performance among others. If it is true the relationship climate-corporate image, so the corporate climate management as a strategic tool could not only impact the performance and efficiency of organizations in their production processes, but also good relations with stakeholders, interaction always mediated by reputation the organization.
<http://www.eumed.net/libros/2007a/223/jam.htm>
- f. **Mentoring and Coaching:** there are many similarities between coaching and mentoring. However, mentoring, particularly in its traditional sense, enables an individual to follow in the path of an older and wiser colleague who can pass on knowledge, experience and open doors to otherwise out-of-reach opportunities. Coaching on the other hand is not generally performed on the basis that the coach has direct experience of their client's formal occupational role unless the coaching is specific and skills focused. That is why we now talk about executive coaching or business coaching, for example. Then, each mentor is a coach, but not all coach is a mentor. Some people prefer not to distinguish and just talk about 'coaching'. But differences between both can not be denied, so the expression 'ontological coaching' has been created for mentoring replacing.
<http://www.koaching.es/2011/02/04/el-coaching-crece-como-incentivo-salarial/#comments>
- g. **Managing across cultures:** In a global scenarios whose intrinsic nature is diversity, only groups of people of different profiles - both demographic and organizational - working in teams, are able to optimize all the resources and organizational systems. Only teams of diverse human resources, well integrated, generate innovation and creativity needed to ensure continuity of business in new global markets, competitive and diverse. (European Institution for Diversity Management: <http://www.iegd.org/spanish800/quees.htm>)
- h. The notion of **social capital (SC)** Putnam (2000), for example, defines it as the collective value of all social networks and the inclinations that arise for them to do things for each other. He talk about two components of SC: **bonding** (SC generated within the group) or value assigned to social networks between homogeneous groups of people; and the **bridging** (SC generated between different social groups) which is equivalent between heterogeneous groups, where SMEs can find two types of capitalization. According to Bourdieu (1983), the individual SC is defined as the set of personal characteristics that enable the individual, social relationships, getting benefits that do not belong exclusively

to the market. Additionally, Coleman (1988) identifies SC with aspects of social structure that facilitate certain actions of agents within that structure. For the World Bank (1999), finally, the SC refers to the institutions, relationships and norms that shape the quality and quantity of social interactions within a society.

- i. **Demographic Change Policies:** (mentioned before) policies taken into account the ageing of the population, so workers too, in a near future. (Source: Adecco Institute, Demographic Fitness report, 2008)
- j. **Health Management:** (also mentioned before) include much more than policies to prevent industrial accidents and basic health checks (which are compulsory, anyway). Source: Adecco Institute, Demographic Fitness report, 2008.
- k. **Social Networks inside the company:** While social networks are still something new for many companies, there are others (especially big companies) which are already using the social networks inside the company. The introduction of these tools is a change in professional and culture management and streamlines business collaborative work. The social networks have been introduced by some companies, for their employees to be in contact, to be aware of their common tasks and the relationship with customers. A first effect is that e-mail and its tedious management loses importance. Reduce training costs, home the existing company knowledge (a heritage that otherwise has the risk of been scattered or lost when an employee leaves the company). One of the most obvious benefits is the location of an expert on specific topics within a large corporation. The entry of social networks in business occurs in parallel to the new culture of cloud computing, where programs and documents are saved on the Web, constantly updated and accessible. Unlike the intranet, the contents of the network grow by direct input of the group of employees and not by the management of an administrator.
http://www.elpais.com/articulo/Pantallas/redes/sociales/entran/empresas/mejorar/trabajo/elpepirtv/20110118elpepirtv_2/Tes
- l. **Networking:** It is the establishment of a net of professional contacts, that make yourself known and your business, and also to meet other people and other companies, listen and learn from each other, find potential collaborators, partners or investors
<http://www.negociosynetworking.net/>

These last tools are not necessarily or directly linked to human resources, although considering their importance and similarity with some other tools of the profile could be considered to include in the curriculum:

m. **Benchmarking:** comes from the word "benchmark" which means the action of taking an object as a model (i.e.: an organization or part thereof) to compare the own company. Benchmarking is a continuous process, used in strategic management, which leading companies of each industry are taken as a model. Benchmarking first determines in which aspects the company needs to grow and then detects the company performs best practices in that area. Those best practices are studied and then applied in your organization. The Benchmarking studies the reference companies and uses its best practices as a comparative standard to reach or surpass.

<http://www.losrecursoshumanos.com/contenidos/125-definicion-de-benchmarking.html>

n. **Crowdsourcing:** Definitions and terms vary, but the basic idea is to tap into the collective intelligence of the public at large to complete business-related tasks that a company would normally either perform itself or outsource to a third-party provider. Yet free labor is only a narrow part of crowdsourcing's appeal. More importantly, it enables managers to expand the size of their talent pool while also gaining deeper insight into what customers really want. <http://www.ticnovation.com/crowdsourcing/> and <http://www.metal20.org/>

o. **Dealing with information overload and avoiding infoxication 2.0:** This is one of the biggest problems on the Web. So, companies should be take care of this, nowadays there are many programs that can help employees to manage to find, save and classify the information they need for work. Another way, could be by training employees, or having somebody who can be in charge of give advices to employees about the use of the Web. <http://www.qpymes.com/como-evitar-la-infoxicacion-en-la-web-2-0.html>

p. **Patents and Trademark (and Industrial Property):** Registering a trademark gives the company the exclusive right to prevent third parties from marketing identical or similar products under the same trademark or using a trademark that is so similar as to cause confusion. If the company does not register the trademark, the investment it makes in marketing a product could be wasted, as its rivals could use the same trademark or such a similar trademark as to cause confusion in order to market identical or similar products. In addition, a trademark license can be granted to other companies, which would mean an additional source of revenue. Trademarks can also be the object of franchise agreements.

An industrial design adds value to a product, making it more attractive and eye-catching to customers and can even become the main reason for buying the product. Protecting valuable designs is therefore usually a fundamental part of any designer or manufacturer's commercial strategy. When protecting an industrial design by registering it at a national or regional industrial property (IP) office, the holder obtains the exclusive

right to prevent its unauthorised reproduction or imitation by any third party. This practice is business logic, as it improves a company's competitiveness and tends to create additional revenue in one or several of the ways described below.

http://www.oepm.es/cs/Satellite?c=Page&cid=1144260495172&classIdioma=en_us&idPage=1144260495172&pagename=OEPMSite%2FPage%2FtplContenidoInformacionGeneral&numPagActual=1

Please value from 1 (low) to 5 (high) how you consider those new orientations previously identified and analyzed are actually being used / implemented in SMEs and their importance for improving SMEs competitiveness:

NEW ORIENTATION	USE IN SMEs	IMPORTANCE FOR SMEs
Knowledge Management	3	5
Generation and enhancement of knowledge	3	5
Competence-based management	2	5
Lifelong learning	2	5
Building teams	1	4
Standardised records of business critical knowledge	1	5
Targeted advanced training programme for renewal of knowledge	2	4
Management by Value	2	5
Corporate Social Responsibility	2	5
Reconciling work and family life	2	5
Gender Equality in employment	2	5
Working time options / flexible working time	2	5
Others:		
Design Thinking	1	4
Outplacement	2	5
Creation of clusters	2	4
Management culture	2	5
Organizational Climate	2	5
Mentoring and Coaching	2	5
Managing across cultures	1	5
Social Capital: bonding and bridging	1	4
Demographic Change Policies	1	5
Health Management	1	5
Social Networks inside the company	1	4
Dealing with information overload and avoiding infoxication 2.0	1	5
Networking	2	4
Crowdsourcing	1	4
Benchmarking	2	5
Patents and Trade Market	2	5

PART 2: NEW TECHNOLOGIES USED IN GENERAL IN SMES RELATED TO THE PROFILE (MAX. 5 PAGES)

Please make a list of those New Technologies being used by SMEs (that you know), give a short description, name in which department mainly are they being used and rate its importance (from 1 lower to 5 higher) for improving innovation and competitiveness in SMEs.

Explanation: be aware that the profile is not going to be defined for a concrete sector or activity so please avoid those specific NT which are used only in some specific kind of enterprises and try to name those general ones which might be used by any SMEs.

NAME OF NEW TECHN.	DESCRIPTION	DEPARTMENT USING IT	RATE OF IMPORTANCE
Work life balance plans	It include a wide range of policies trying to balance between 'work' (career and ambition) and 'life' (health, pleasure, family, leisure, personal development).	All	5
Workplace based training initiatives	Its goal is to enable someone to acquire the knowledge, skills, and attitude to do something that they couldn't previously do. In many cases this also involves learning to do some aspects of their job differently. It is strong related with Mentoring programmes.	All	4
Equal opportunities	It promotes the idea that everyone within an organisation should have an equal chance to apply and be selected for posts, to be trained and/or promoted and to have their employment terminated equally and fairly. So workers should not be discriminate, or treat unfairly, because of their gender, race, sexual orientation, age or disability.	All	5
Teambuilding	Its focus is in bringing out the best of a team, to ensure self development, positive communication, leadership skills and the ability to work closely together as a team to solve problems.	All	5
Social Networks (outside the company)	This concept has become popular because of Internet, especially in the last 10 years by its intensive use and development. It includes not only e-mail, websites, blogs, etc but also what today is called WEB 2.0 which include twitter, face book, flicker, LinkedIn, MySpace, among many others.	1,2,3,5,6,9	4
Creation of entirely new position	Nowadays, thanks to the great development of internet use, new position are appeared in the job market, for instance, Community Managers	All	4
Knowledge Management	enables companies to understand the role that employees play in keeping the business going – and the risks that companies run when key employees depart	All	5
Emotional	It is the ability of people to recognize feelings in oneself and others, having the ability to manage at		

Intelligence	the moment is working with other people. http://www.eumed.net/libros/2007a/231/64.htm		
Work environment	It involves many different such as: Noise, Ventilation, Temperature, Lighting, cleanness, appropriate chair /desk / tools for working, etc.	All	5
Quality management	Quality management uses quality assurance and control of processes as well as products to achieve more consistent quality	All	5
Business Intelligence	It aims to support better business decision-making. Thus a BI system can be called a decision support system (DSS). BI uses technologies, processes, and applications to analyze mostly internal, structured data and business processes	All	5
Competitive Intelligence	It gathers, analyzes and disseminates information with a topical focus on company competitors.	1,2,3,8,9	4
ICT INNOVATION (the following tools are used in National reports to know how innovative a company can be):			
E-mail	System for sending and receiving messages electronically over an internet computer network	All departments	5
Computers	a programmable machine designed to sequentially and automatically carry out a sequence of arithmetic or logical operations	All departments	5
Mobile telephony	an electronic device used to make mobile telephone calls across a wide geographic area	All departments	5
Local Area Network (LAN)	a computer network that connects computers and devices in a limited geographical area	All departments	5
Wireless LAN	links two or more devices, providing a connection through an access point to the wider internet	All departments	4
Internet connection	is a global system of interconnected computer networks, linked by a broad array of electronic, wireless and optical networking technologies	All departments	5
Intranet	a private computer network that uses Internet Protocol technology to securely share any part of an organization's information or network operating system within that organization	All departments	4
Extranet	a computer network that allows controlled access from the outside, for specific business or educational purposes. An extranet can be viewed as an extension of a company's intranet that is extended to users outside the company	All departments	4
Website	A web page is a document, typically written in plain text interspersed with formatting instructions of Hypertext Markup Language (HTML, XHTML).	All departments	5
ERP (Enterprise Resource Planning)	integrates internal and external management information across an entire organization embracing finance/accounting, manufacturing, sales and service, etc, with an integrated software application	1, 4, 5, 6,7, 8	5

CRM (Customer Relationship Management)	a widely-implemented strategy for managing a company's interactions with customers, clients and sales prospects. It involves using technology to organize, automate, and synchronize business processes	2,3,5,6,7,9	5
e-commerce	consists of the buying and selling of products or services over electronic systems such as the Internet and other computer networks	1,2,3,5,7,9	4
Software Security	software that protects the data and resources contained in and controlled by that software	All departments	5
Devices for mobility	Like Smartphones, Ipads, Tablet PCs, Netbooks, etc, that increased mobility management when workers are out of the office, increased access to email, schedules, contacts, internet...	1,2,3,4,5,6,9	4
Office automation	A computer-based information system that collects, process, store and transmit electronic message, document and other form of communication among individual, work group and organizations, i.e.: word processing, electronic mail, desktop publishing, telecommunication and document image processing. Using in different areas, as invoicing and accounting, etc	All departments	5
GPS technology	The Global Positioning System (GPS) is a space-based global navigation satellite system (GNSS) that provides reliable location and time information	5,6,7,9	3
Broadband	It refers to a telecommunications signal of greater bandwidth, in some sense, than another standard or usual signal (and the broader the band, the greater the capacity for traffic).	All departments	4
POS terminal (Point of Sale)	Or checkout, is the location where a transaction occurs, generally refers to the hardware and software used for checkouts, the equivalent of an electronic cash register (TPV in Spanish)	2,4,5,6,7,	4

Departments:

<ol style="list-style-type: none"> 1. Global environment of the enterprise 2. Management Strategy 3. Information and Communication 4. Human Resources 5. Suppliers' Management 	<ol style="list-style-type: none"> 6. Clients' Management 7. Production 8. Economic and Financial Management 9. New Technologies
Some examples of New Technologies that can be considered: office; quality system; corporate website; e-marketing....	



PART 3: CONCLUSIONS (MAX. 5 PAGES)

RESUME OF SITUATION OF SMES WITH RESPECT TO PREVIOUS POINTS ANALYZED UNDER INNOVATION AND NEW TECHNOLOGIES

a. Resume of right now situation

The Spanish innovation system has developed over the 2000s in order to respond to the objectives set by national development priorities and the EU's Lisbon Agenda. However, despite the efforts made, national innovation performance continues to underperform compared to other EU Member States. This underperformance in innovation seems to be partly due to relative weaknesses such as insufficient business investment in R&D, and weak linkages in the innovation system and entrepreneurship. Considering that Spain has been particularly hard hit by the economic recession since the fourth quarter of 2008, it is during this period that Spanish authorities have made special efforts to continue developing a set of instruments addressing main challenges that would drive a coherent RDI policy mix. In general, the research and innovation support system seems to be evolving in the right direction, with the main measure achieving acceptable results: INGENIO 2010 (launched in 2005) which has been implemented effectively and coordinated with the 2008-11 National Plan; the Consolider programme that managed to mobilise groups of prestigious researchers resulting, in some cases, in the creation of permanent research structures; the CENIT programme (National Strategic Consortia for Technical Research) that had a positive boost effect on cooperation between companies and, finally, the Avanza programme supporting the development of the information society.

The innovation system in Spain is accomplishing, to a greater or lesser extent, most of the objectives established in the different RDI policies. Several challenges and threats are still present, some of them are own failures of the system and others are due to the current economic situation, such as the lack of cooperation between universities and enterprises, the scarce R&D entrepreneurial expenditure and the lack of qualified RDI human capital. This indicates there is much effort to be made in this sector, especially introducing an RDI culture to society, the public sector and, mainly, the business sector which is one of the key elements to achieving a higher development and diffusion of Spanish RDI. Focusing on enterprises, although there are a wide range of measures to make incentives for RDI, an increase in RDI entrepreneurial expenditure is needed and also more support is required on the part of SMEs to be given more facilities to access venture capital or for reducing administrative barriers and bureaucracy.

The new Law of Science and Technology represents a great opportunity for the innovation system due to it strengthening good practices of the Spanish system and reforming various weaknesses of the sector as the lack of RDI human capital, management of the RDI system etc. Furthermore, the 2008-11 RDI National Plan provides an important chance to enhance and coordinate in better and more effective way RDI responsibilities between the central government and regional authorities. From a vertical coherence point of view, Spanish governance of innovation policy still lacks some clarity on the role of the regions in the national strategy. There is a need to ensure that institutional



coordination and planning work to serve the broader national interest; indeed, there is still a risk of duplication, lack of synergy and overlap or even conflict of objectives.

Probably the most serious challenge of the Spanish innovation system is the mentioned instability of participation between public and private sectors. Spain relies on a high-level scientific community. However, the research sector, developed in a wide net of researching centres and universities, is not adequately oriented to enterprises. As a consequence, Spain has great potential on scientific discoveries and advances that is not converted to marketable commodities and services nor transferred in a technology way to industry; in other words, this capacity does not generate money.

Regarding the business area, Spanish companies, and specially SMEs, have realized that it is not any more just the prices which make a company competitive in the market. Nowadays, innovation is the main tool to compete. However, SMEs generally find more difficulties to make continuously radical innovations than larger firms, since they have fewer resources and lack of specialized department in RDI, although there are some exceptions depending on the sector. In addition, SMEs are not allowed to take advantage of economies of scale enjoyed by larger companies. Of course, the scope of a company may differ significantly from each other and thus lead to different innovation needs. Currently, the sectors in which there was greater innovation intensity between SMEs are involved in biotechnology and information technology and telecommunication (ICT).

Finally, according to the review made for this report, it is clear that Spanish government has as priority of its policies, large firms, and among SMEs, especially the medium companies (from 50 to 250 employees). Also, gazelle companies which tend to be medium or large firms, and to encourage the creation of cluster (one again, normally include medium or large companies). Although, 94.48% are microenterprises (from 1 to 9 employees), there are clear and enough information about them. This makes almost impossible to know their real situation and real needs, so the national and local authorities can not define useful policies for them.

b. Resume of needs and lacks

In a general sense, the main weaknesses of Spain remained the same: the low number of innovative enterprises; weak innovation orientation of enterprises; few industry-science links that required support to increase collaboration between agents of the Innovation System; and the low number of scientists and technologists in the private sector (so, to overcome the lack of qualified RDI human capital it is needed).

In terms of implementation, the two-tier structure of national and regional system makes it difficult for firms, especially SMEs and other individual stakeholders to exploit synergies between national and regional policies. Moreover, even at national level, competence sharing among the Ministry of (Science and) Education and the Ministry of Industry, Tourism and Trade (MITYC) have traditionally



been a source of political conflict that still remain to some extent despite the effort made by the current government to unify all innovation competences under the MICINN.

The government must support enterprises and public centres to learn to work together; i.e. it must foster R&D public-private collaboration which reports great advantages. First of all, cooperation allows for undertaking more ambitious projects by means of accumulation of a high volume of resources and a distribution of the risk. Secondly, it easily generates synergies rising from the connection between basic R&D (from R&D public centres) and applied R&D (which is developed most commonly in enterprises). Thirdly, it eases bonus problem to scientists: obtaining an extra remuneration due to the association with enterprises lets public scientists complement their wages. Finally, it provides enterprises with the possibility of having specialised human and physical resources without high fixed costs, through externalisation of some technological activities.

Public administrations have to foster R&D in Spain, extending and strengthening an innovation culture among enterprises and providing better conditions to carry out innovative activities and qualify their knowledge resources. Furthermore, enterprise economic results measured through the sales and gross profit are better for innovative companies (usually there is a difference of eight points between innovative and non-innovative enterprises) which is an important incentive to invest in R&D.

According to DGPYME (2010), include the following recommendations to meet the needs of RDI in general for all productive sectors, many public administrations as implementers and technology providers.

- Seek synergies of cooperation between the associations representing every sector, government and private entities.
- Enhance ICT dissemination strategies to raise awareness among companies using new technologies as a generator of productivity and competitiveness.
- Promote training and adequate technology training for workers and employers in different sectors.
- Provide financial incentives to help reduce the barrier of lack of funding to make the investment in technology.
- Promote the standardization and creation of a new catalog of ICT solutions from the industry and ICT suppliers, to suit the specific needs of each sector and company size.
- Facilitate the integration and interoperability between platforms and systems technology.

MAIN CONCLUSIONS AND RECOMMENDATIONS

Because of the current economic crises, Spain has an unemployment rate of around 20% and it is expected to increase a little bit more this year, innovation regarding human resources management is not even considered. Governments, National and regional, are trying desperately to implement policies to mitigate the effects of such high destruction of employment. So, all the policies regarding innovation refer directly to technology and in a minimum scale to contract researchers. However, it could be a good moment to offer alternatives to the society, and to show companies especially SME, that innovation regarding human resources can be much more productive (in the short and medium term) than investing huge amount of money on technology (normally medium and long term).

On the other hand, interesting initiatives are taken by the different regional governments, for instance, Cantabria, through its agencies to support SME has been recently contracted Foreign Commerce Advisors to offer their services to SME's who can not afford to have that kind of experts and are willing to sell outside their boundaries. We think that something like this initiative could be very helpful for the people trained by this profile and for Micro and SME's who are willing to innovate in human resources, but do not have enough resources.

a. For the definition of the profile (profile areas and content by area)

According to the research, in Spain, we do not really have a figure or advisor that can satisfy all the background that join this profile. Although, independent consultants or consulting companies offer advice in many of the areas of the profile, it is normally more focused on Medium and Big companies than Micro and Small ones.

It is a comprehensive and wide profile.

b. For the work to be done in the SMEs by the person trained with this profile

Especial care should require the selection of people to be trained by this profile, since it demands at least basic knowledge regarding ICT skills and some business background which can make the difference between success and failure in the job market for the people trained, because this profile is almost entirely new in our job market.

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