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Spain: The Situation of Informatics in 2009

Fernando Piera-Gómez

This article describes informatics and information technologies in Spain during the current economic crisis. The author provides data about the economic significance of informatics in Spain, the human resources involved, and the implications for education as well as the current situation of digital contents.

Keywords: Digital Contents, E-Commerce, Education, Electronic Content, Electronics, Hyper Sector, Informatics, IT Employment, PISA, R&D Investment, Spain, Telecommunications.

1 Introduction

Informatics in Spain has been evolving since the sixties of the last century and growing constantly. Spain installed its first big computer back in 1969 and both public and private sectors have become common users of these new technologies, which are commonly called Informatics or Information Technologies (IT).

One factor that is not normally considered when analysing the situation of informatics in a given country is the attitude of ordinary citizens as IT users. In the case of Spain, citizens did not have too many problems adopting this new technology for particular applications which met their specific needs. The most outstanding example of this is the use of digital banking via the Internet, and the use of Automatic Teller Machines (ATMs). Spain is in the leading group of countries for the use of both these informatics applications.

In this short article I will try to describe the situation of informatics and information technologies in Spain during the current economic crisis of 2009. In the paragraphs below the reader will be able to find some data about the economic significance of informatics in Spain, the human resources involved, the implications for education, and the current situation of digital content.

2 The IT Hyper Sector in Spain

The transformation of the Spanish economy through electronics and informatics is worth considering. Spain has to make use of the present economic crisis to make a qualitative leap forward, by carrying out the reforms needed to ensure that generations to come will have a future full of hope as citizens of an advanced society.

At present we find that the economic sector of information technology has become a sort of economic hyper sector with a wide range of reports and statistics, including telecommunications, electronic content and electronic commerce, entering into its data.

In Spain in 2007 the IT hyper sector was estimated to be worth 101,353 million euros. In 2008 this increased to 102,668 million euros, a hike of only 4% compared to a 9% increase between 2006 and 2007 [1].

Author

Fernando Piera-Gómez was born in Madrid (Spain), June 2, 1939. He is a Law Graduate from the *Universidad Complutense de Madrid* and an Informatics graduate from the Polytechnic University of Madrid. Fernando began his career in Informatics in 1967, and in 1969 he created the Data Processing Centre of the Spanish Ministry of Education, providing timesharing services to Spanish universities, among other services. In 1969, he also prepared the regulation for the first educational institution for Informatics, the *Instituto de Informática*. From 1974 to 1986 he worked for the Intergovernmental Bureau for Informatics (IBI) where he organized some international conferences, such as the first Transborder Data Flows International Conference, and he was Deputy Secretary of the 1978 SPIN Conference. At the IBI he reached to be Deputy Director General. Since 1988 he has worked for Indra Sistemas managing Research and Development (R&D) projects within the FP of the European Union (EU). He is currently 1st Vice President of ATI (the Spanish Informatics Society), President of the European Certification of Informatics Professionals (EUCIP) Spain Foundation and Chairman of the Editorial Board of *Novática* (journal of ATI). <fpiera@ati.es>.

In order to understand better the distribution of activities in the hyper sector, the data available for 2007 can be broken down as follows:

- Audiovisuals: 5.7%.
- Consumer electronics: 6.45%.
- Information technologies: 17.2%.
- Telecommunications: 30%.

In 2008, enterprises using computers in Spain represented 91.4% of all existing enterprises, and employees using computers represented 55.5% of the workforce. 72.4% of all enterprises had interconnected computers. But still only 41.3% of companies used electronic commerce. 39.1% of them bought products and services via the Internet but only 7.2% used the Internet to sell on.

3 IT integration in the Spanish Educational System

The first consideration to note is that available data indicates that there is a high level of familiarity with IT among

the management, teachers and students of primary and secondary educational institutions. They use it frequently in their daily activities and have reached a level of digital literacy much higher than the average of the Spanish population.

If we take the Internet as an example, about 90% of students over 11 years old and their teachers have some knowledge of how to use it, compared to only 49.4% of the total population [2].

The same disparities appear between the education community and the general population when we consider access to computers in the home.

In spite of this, the Spanish school system still lags behind the more advanced countries in the European Union when it comes to the availability of IT resources, although this has started to change. If we take the number of computers per educational centre, Spain would be in a relatively low position when compared to the data listed in the 2004 Programme for International Student Assessment (PISA) report that cites the 2003 average number of computers per education centre as 377 in the United States, 289 in Korea, and 255 in Australia. The figures for Europe show the leaders as The Netherlands, with 129, Belgium with 89, Sweden with 85, Italy with 77, and Switzerland with 70. But if we take more interesting and illustrative data such as the ratio of students to computer, the picture is very different. In Spain, the average is 11:1, with educational centres that provide compulsory education reaching 48:1. This ratio increases to 15:1 and 46:1 respectively if only computers used for educational purposes are counted. But this ratio is much better if we count only primary and secondary schools; it then becomes 7:1 and 58:1, and for 2008, 7:1 and 45:1, which is comparable to the ratios that appear in the eLearning Policy Indicators (European Commission, 2006) carried out in 27 countries (EU 25 + 2). According to this study, the countries that represented the best ratios were: Denmark with 5:1 and 37:1, Norway with 5:1 and 52:1, the United Kingdom with 6:1 and 28:1, and The Netherlands with 6:1 and 49:1.

4 Digital Content

According to [3], digital content in 2008 in Spain represented a business value of 10,362 million euros, an increase of 2% from the previous year. This area employs 41,263 workers, up by 5% over the previous year (see Figure 1).

5 R&D Investments

With regard to R&D expenditure, more than 2,000 million euros was spent in 2007, and in 2008 this increased by 8% to reach 2,351 million euros.

6 Personnel and Employment in IT

In 2007, the percentage of people employed in the IT sector increased by 3% from the previous year, but 2008 saw only a slight increase, bringing employment in the hyper sector to a total of 356,000 [4].

With reference to companies providing IT training for their employees, only 18.3% do so. 16.4% advertise on the Internet, and 13.6% make use of digital marketing.

The number of women working in the IT field as professionals now represents 40% of all workers in the IT sector.

Even with the present economic crisis, Spanish companies plan to increase the workforce in IT by 6.7%, which is more optimistic than in previous years. With regard to IT activities in 2009, most Spanish companies anticipate an increase in employees.

The personnel with academic degrees required for IT jobs represent 57% of the total: the percentage of traditional IT degrees requested has reached 30% since 2005, followed by telecommunications degrees at 20%, economics degrees at 9.5%, and industrial engineering degrees at 7%. The number of other degrees requested, including law, mathematics and physics, represents only a marginal percentage of the total. The average IT professional is between 33 and 40 years of age.

In the Information and Communication Technologies (ICT) sector as a whole we need to consider 80 professional categories in seven typical departments of the IT sector: a)

Subsectors	2007	2008	% Variation
Audiovisual	6,784	6,956	3%
Cinema/Video	909	833	-8%
Music	284	254	-10%
Internet	482	610	27%
Digital Publications	286	217	-24%
Video Games	719	744	3%
Content for mobile	700	748	7%
TOTAL DIGITAL CONTENT	10,164	10,362	2%

Figure 1: Business Value of the Digital Content in Spain by Subsectors (in Millions of Euros).

commercial; b) administration; c) development technician; d) administrative-financial; e) operations; f) maintenance; g) acquisitions-logistics; h) infrastructure.

Salary levels vary according to the department and the employment category within the department. The highest salary level corresponds to commercial managers who have had an average annual increase since 2005 of 5.06%, reaching an annual average of 96,940 euros in 2008. On the other hand, managers in manufacturing continue to receive the lowest salaries; they have seen a reduction of 23.9% over the same period, reaching an average annual salary of 44,964 euros.

One thing to note is that the opposite happens with academic university degrees. Enrolment for medium level academic degrees has increased compared to enrolment for higher degrees. Medium-level degrees represent an average of 58% compared to only 36% for high-level degrees. The second consideration is that technical education has continued to increase since 2002, until the 2002-3 academic year in which it reached a total of 400,000 students, which is a decrease of 10% for the period, but with medium-level degrees experiencing an even greater decrease. A medium-level degree is equivalent to graduate level in the Bologna plan, and a high-level degree is equivalent to a Master degree in the Bologna plan.

For ICT degrees, the tendency is similar though more accentuated. Thus in 2006/7 the decrease amounted to 15% as against 10% for the whole of the technical engineering sector. If we consider the gender issue then we find that in the technical sector only 27% of enrolments were made by women; this figure is only 20% for the ICT sector compared to an average of 54% for the all university degrees.

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