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# ICT as an Opportunity for Regional Development: the Extremadura Case

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**Abstract:** The present paper describes the case of Extremadura Region as well as the lessons that can be learned from the processes of re-focussing its regional growth strategy. A brief introduction will show the way many regions or even economic districts have to follow in order to adapt their growth strategies to this changing economic environment. The Information and Communications Technologies have proven to be of enormous importance in the case of Extremadura. It will continue with regional restructuring processes and which sectors or areas have been identified as the main focal points for cross-regional learning. Best Practises in some of the regions under study will be also showed. To finish, pillars and success factors that have managed Extremadura's regional development strategy converting it into an Information Society strategy will be enumerated; as well as the impact of these in the regional policies carried out by the Regional Government.

## 1. Introduction

The world economy is changing, globalisation, economic and occupational uncertainty, and industrial delocalisation are affecting European countries, regions and industrial districts. To be able to keep up with these changes, many regions and economic districts have to re-focus or even re-invent their growth strategies.

Globalisation means new, deeper internationalisation processes evoked by technology and liberalisation, where technology is the driving force, as it enables the fast execution of different transactions around the world at a reasonable cost. The progress in information and communication technologies, in particular, has caused a significant change in the global ways of acting.

The regions of Europe confront new challenges for their development, the increasing globalisation of trade alters comparative advantages and causes the redistribution of activities: increasing externalisation of services and relocation of certain low value added but high labour force intensive activities (e.g., textiles), of certain service activities (e.g., call centres), and even of certain research activities. The spread of information and communication technologies accentuates this phenomenon, by reducing the constraints of proximity to markets in choosing where to establish enterprises. For regions, seeking to become and to remain competitive whilst simultaneously striving to become more inclusive, ICTs offer important prospects and potential

There are several examples of European regions and/or economic districts that have been able to renew their strategies and experience economic growth in this changing economic environment. For Europe's regions and regional policy, the information and communication technologies are both an opportunity and a challenge, an opportunity because these technologies create new prospects for development, especially in the more isolated regions and a challenge because of the digital divide between rich and poor

regions, urban and rural regions, and even within regions. Today, however, a region's competitiveness lies in its potential for innovation and the new technologies can be an instrument for social integration or a source of exclusion if not available to all.

The information and communication technologies have proven to be of enormous importance to bring about this change in the region of Extremadura, an example of how these technologies can be used to create economic growth beyond expectations.

## 2. Objectives

The experience of the region of Extremadura is well documented and is one of the best practices to be included in the ongoing work of the SECTOR project, financed under Article 6 of Innovative Actions of the European Social Fund.

The main theme of the project is to “manage the restructuring” as reinforcing instrument to improve the territorial and partner’s competence to adapt their structures and resources to the new economic trends (such as markets globalisation, economic and occupational uncertainty, industrial delocalisation) adopting efficient and effective solutions to these critical points especially at a local level considered (provincial and local productive districts).

This will be done by benchmarking the different strategies opted for by the four participating regions or zones: Lombardy (Italy), Vale do Ave (Portugal), Rhône-Alpes (France) and Extremadura (Spain). Each region provides a specific set of sectors or areas for cross-regional learning, either by providing restructuring success stories within specific sectors, such as textile and metal and metalmechanics; as well as providing success stories for restructuring of the regional development strategy, such as the movement from a traditional agricultural based economy to a knowledge and ICT-based economy.

The present paper, will describe the case of Extremadura, as well as the lessons that can be learned from the processes that underly the re-focussing of its regional growth strategy, and will place this experience within the framework of the ongoing work of the SECTOR project. The relevance of this experience lies in the cross-sectoral and horizontal aspect of the strategy.

## 3. Methodology

Regions in Europe vary greatly, in terms of population size, territorial area and political/administrative powers. European regions<sup>4</sup> are related to the political and administrative boundaries of different Member States but the two approaches are not always coterminous. But whatever their differences, one thing is true, regions are best placed to appreciate needs and to develop policies by encouraging relevant actors to focus on shared interests and increasing competitiveness.

Developing strategic perspectives from a regional standpoint is anything but easy since there are no prescriptions and no panacea. The SECTOR project provides help by developing models for (regional) restructuring, based upon lessons learned from success stories in several European regions.

*Regional restructuring in the project is defined as the economic actors’ response to resolve a crisis on the regional level.[1]*

Special attention will be paid to the so-called “subjective” factors which have a profound influence on regional economic and social development [2]. These include the readiness of regional authorities and other key economic actors to be actively involved and cooperate in the promotion of economic growth and employment in their region, to build the awareness of the population concerning the inevitability of local economic

restructuring, and to convince the population to take a positive, active part in this restructuring.

The lessons learned and benchmarking exercise lead to models which can be adapted and/or adopted by other regions, facing economic crisis and/or a changing environment. A combination of desk-research, focus group, and interviews give way to the benchmarking of the different processes that have led to restructuring, being it either in a specific sector or in a region or area as a whole.

The desk research focussed on the recollection of knowledge on the economic reality of the region and/or sector, and on the identification of documented experiences that can be considered good practices. The focus groups were used to re-fine the desk research and obtain more detailed information on the specific experiences and identify those that are not documented.

A set of different sectors was identified, due to the importance for the region's economy and the impact the changing environment is having on the sector. The table below indicates the sectors and the regions that will focalise their activities and research on these sectors, not excluding any contributions they can make to other sectors.

*Table 1: Sectors*

<b>Sector</b>	<b>Main challenges faced</b>	<b>Regions</b>
Textile	One of the sectors where globalisation is affecting most is textile, subject to the foreign competition not only from China, but also from India, Turkey and other Eastern countries. The ones that face the largest difficulties are the small manufacturing companies.	Vale do Ave Lombardia
Metal and Metalmechanics, including iron and steel production	One of the structural components of the modern industrial system, but also, because of the characteristics of its production and market, one of the most affected by the globalization. Increased competition from emerging countries, such as China, India and Eastern European Countries, require the companies of the sector to refocus their strategies.	Lombardia Rhônes-Alpes Extremadura
ICT	It is clear that a knowledge-based economy requires much more than the development of ICT industries and services, even if those constitute its basic infrastructure, or the shift to high-tech industries. It is more about how IT information and knowledge can improve the efficiency and competitiveness throughout the economy	Extremadura Vale do Ave

The desk research and focus groups have provided first identification of good practices.

Concerning the textile sector, the present crisis has created the need to embrace innovation, creativity and marketing, and to offer not only textile products but textile services, greater cooperation not only between companies, but also with research centers and public administration is being set up. The Lombardy experience in upgrading and delocalisation as anticipation to crisis, and the experience of some Vale do Ave companies that opted for entering the value chain upstream, at the beginning of the production process, getting ahead of the market and increasing R&D substantially, provide the valuable input for the model to be designed.

Metal and Metalmechanics, including iron and steel production, being one of the structural components of the modern industrial system, but also, because of the characteristics of its production and market, one of the most threatened by the changes imposed by globalization. Increased competition from emerging countries, such as China, India and Eastern European Countries, require the companies of the sector to refocus their strategies.

In Lombardy, in the Metal and Metalmechanics sector, several networks of specialised and complementary SMEs excelling in metal engineering and electric equipment were created, while the Rhône-Alpes region provides experience in the creation of clusters and their role in upfroniting crisis, both in the sector as well as on individual company level.

When looking at the role of ICT in regional development, this cannot be seen independently of changes related to the views on the importance of human capital as main production factor. Much of recent thinking on processes of regional development stresses the role of knowledge as a development factor, often raising it to an overwhelming importance relative to more traditional factors such as labour and capital.

The experience of Extremadura concerning the refocussing of a complete regional development strategy, moving from a traditional economy to a knowledge based one, will provide the main model for restructuring related to new technologies and will be complemented by other relevant experiences, being it on regional, local or even sectoral level, where information and communication technologies have played a significant role in anticipating and/or upfroniting economical changes. The experience will be specially relevant for North Portugal, which has set out as main objective for the future become a knowledge, innovation and social responsible region, with ICT as the main driver.

Focus during the first research (desk research and focus groups) made the main issues related to the need for restructuring of a regional economy visible, and to provided access and knowledge on good practices in the field of restructuring, taking into account the processes that lead to the new strategy and the involvement of the different regional actors.

This second research phase focusses on the experiences of individual companies in relation to the processes created to upfront the challenges set out.

A series of experts, extracted from the stakeholders participating in the focus groups, of the participating regions will be integrated into a network which provides support in the adaptation of the best practices to other regions through the strategic laboratory, for example within the framework of the laboratory a joint team of experts in ICT based regional development of Extremadura and stakeholders from Vale do Ave, will adapt, develop and apply the Extremadura experience, to create for the area an own ICT-based strategy, based upon the realities and specificities of the region and its economy. This method will be transferred to the any other region interested in joining the network and in providing best practices and experts for the strategic laboratory.

#### **4. The Strategy**

According to the framework defined by the World Bank Institute, the transition towards a knowledge based economy requires progress in four key pillars : (i) an economic and institutional framework that promotes the efficient use of knowledge and the flourishing of entrepreneurship; (ii) an educated and skilled population to create, share and use knowledge; (iii) a dynamic information infrastructure; and (iv) an efficient innovation system of firms and research centers to tap into the growing stock of global knowledge and create new responses to local needs. The European Research Advisory Board defines a different but very much related set of key factors for success.

Extremadura is considered an Objective No. 1 region, with a population density of just 25.9 inhabitants per km<sup>2</sup>, its principal activity being services. The rate of unemployment is 16.5%. However, it has entered the 21st century in the best position ever in history.

Economic indicators and the standard of living are growing year by year above the Spanish Average (in 2006 being the 3rd fastest growing region in Spain), although this convergence phase has not reduced the differences existing with relation to other regions. The turn-around came, when in 1998, when the region decided to promote a new model for regional development based on science, innovation and new information and communication technologies, which are considered essential to address Information Society challenges.

*Table 2: Key Success Factors*

1. Improving the regional skills base: the availability of skilled, flexible and motivated workers is of fundamental importance to a region's capacity to undertake research and innovation.
2. Stimulating co-operation and collaboration: well functioning networks – both formal and informal - are needed to realise regional potential for research and innovation. They stimulate knowledge and information exchange, joint learning and help to build the critical mass required for successful research and innovation.
3. Improving and strengthening regional infrastructure: actions in this area can focus on the provision of public sector or academic research facilities, or on developing facilities to stimulate private sector activities and infrastructure for private-public-partnership research initiatives such as centres of competence.
4. Mobilising capacity: the secret of stimulating the potential for research and innovation in a region rests upon mobilising the capacity that already exists, rather than simply seeking to add more.
5. Financing research and innovation: Financial tools, such as specialised Venture Capital funds and proof of concept funds, play a valuable part in stimulating levels of research and innovation.
6. Establishing the evidence base: a solid evidential base is required, this can be established through benchmarking exercises, foresight exercises and audits of research and innovation capacity within the region [3].

This turn-around in Extremadura's regional development strategy has taken into account the aforementioned pillars and success factors, and has molded them into a customised set on which to base the regional Information Society strategy.

Success is based upon:

1. Creating and entrepreneurial culture for ICT-based enterprises
2. Digital literacy plan to educate and train for the information society
3. Solid information infrastructure
4. Efficient regional innovation system
5. Institutional framework that promotes a continuous dialogue with stakeholders

This strategy intended to promote the use of ICT by the citizens, taking advantage of all their possibilities, especially in the field of training and the generation of business, to improve the standard of living of people in Extremadura.

#### *4.1 Creating and Entrepreneurial Culture for ICT-based Enterprises*

As a support for creators of businesses based on new technologies, a programme destined to encourage new businesses in the sphere of the Information Society was developed. It places at the disposal of young entrepreneurs with creative capacity, the resources to enable them to develop their activities, by offering support services and favouring intercompany collaboration and cooperation.

Recent technological and economical indicators show that SMEs are the motor of innovations and regional developments. The increase in the number of SMEs mainly servicing and developing ICT based solutions in the region of Extremadura supports aforementioned observations.

## 4.2 *Digital Literacy Plan*

Through investment in education and information technologies, Ireland has transformed its once rural-based economy to one of Europe's largest exporter of high tech products and services and provider of knowledge workers.

Ireland has shown that a country, traditionally labelled as one of the poorest members in the European Union, was successful in transforming its economy from one dependent on traditional sectors (i.e. agriculture, low-end manufacturing etc.) to a provider of high-tech services. This transformation can be mainly attributed to the following two factors: (i) sustained and well-targeted investment in education; and (ii) a policy framework favourable to foreign direct investment, notably within the ICT sector, which has helped it to capture one of the highest net inflows in the world, at 20% of GDP, second only to Sweden.

In Extremadura the the digital literacy plan does not just offer training to all sectors of the population (elderly, young people, women, professionals, students, etc.) but we are also concerned that Information and Communication technologies are really within reach of all citizens. Training courses for ICT have been implemented all over the region.

Digital literacy in the primary and secondary schools has lead to the conversion of classrooms into areas for ICT based learning, with a ratio of one computer per 2 students in secondary education, and one per 5 students in primary education. Nowadays over 70.000 computers have been installed in the educational system.

## 4.3 *Regional Infrastructure*

With the process of liberalisation of the European telecommunications market, Extremadura again entered a risky situation, as it was highly unprofitable to take broadband infrastructures to small towns where most of the population of Extremadura lives.

This scenario led to the establishment of the basic objective of ensuring the accessibility of all citizens to the infrastructures and services offered by the Information Society, and two main actions have been taken in this field. The first one is the contracting of a corporate network (2 Mgb/s minimum on more than 1 400 points) called the Regional Intranet, which was the first of its kind in Europe, as it includes all regional government buildings in the entire territory (schools, high schools, health centres, administrative attention centres, hospitals, employment offices, etc.).

The second one, Broadband for All, in reality a continuation of the Intranet, was created to develop infrastructures in 100% of the municipalities in region, with specific focus on those that, for the fact of not being sufficiently attractive for the different telecommunications operators, do not have broadband access to the Internet. Since the end of April 2007 the objective has been completely relaised.

The need for initiative of the regional government was apparent, as these infrastructures would otherwise have taken a long time to arrive if just moved by market forces, or in the worst case, would never have arrived at all.

## 4.4 *Regional Innovation System*

The regional innovation system is “a system of innovative networks and institutions located within a certain geographical area, with regular and strong internal interaction that promotes the innovativeness of the region’s companies.” [4].

Policies seeking to stimulate research and innovation must be appropriate to the needs of particular regions, and to the requirements of organizations within that region. Extremadura has been succesfull in creating an innovation system which empphasizes the horizontal role of ICT. The most illustrative figure is that in Extremadura, the percentage of R&D expenditure over the GDP increased from 0.28 (1995) to 0.62 (2003).

#### 4.5 Institutional Framework Promoting Continuous Dialogue with Stakeholders

If key regional and local institutions join together to discuss development possibilities, agree on joint measures, and cooperate closely on their implementation, then some of the factors that are unfavourable to development might be changed for the better, or at least mitigated. The success of restructuring in different regions has depended very much on the extent to which regional institutions collaborate to make positive adjustments to changing economic conditions.

Strategies for the information society, because of their transversal nature, present the challenge of involving actors from very different fields: information and communication technology specialists, local authorities, associations, public services, training organisations, social partners, etc.. The definition of strategic guidelines and choices on priorities are consequently complex and must be negotiated, requiring strong involvement of regional decision-makers to reach a consensus.

Several years of work, study and design were necessary to draw up the strategy, with the participation of practically all social sectors. It should be considered as the collectivisation of a process. Business people, trade unions, associations, technological centres, the university, chambers of commerce, institutions, etc., all expressed their opinions and established the regional needs.

### 5. Impact

In the mid-90s the regional government of Extremadura saw that new information technology could help the region to overcome its historical “peripheral” situation. The 90’s were highly significant in this matter because before finishing the process to cover essential needs (electricity lines, water supply, communications, housing, etc.) to correct the existing unbalances, the new guidelines for development of the Region were already being designed to supply the Region with the qualities and competitiveness needed to live in a society that is beginning to change the way it works, how it does business, its social relations, teaching, learning coexistence in general, due to the influence of new technologies.

In this sense the actions described are in line with the Information Society policy aims as identified by the Structural Funds.

Table 3: IS Policy Objectives

<b>Indigenously driven development</b>	<b>Exogenously driven development</b>
Developing existing firms and encouraging new firm formation in the region.	Attracting inward investment through high levels of IT skills, good quality telecommunications infrastructure, etc.
<b>Equity (social cohesion)</b>	<b>Efficiency (competitiveness)</b>
Using ICTs to target economic and social exclusion within the region. Narrowing the digital divide.	Using ICTs to gain competitive advantage over other regions.
<b>Increasing the supply of ICTs</b>	<b>Increasing demand for ICTs</b>
Supply is an issue for the market, but may still require public intervention eg. to ensure coverage of sparsely populated or remote areas.	The EC’s guidance to programmes favoured demand-side interventions.

The consolidation of different actions in the global strategy, in education and supporting the creation of businesses based on new technologies, or promoting an ambitious technological literacy plan, took the regional government to a point where, to maintain this with guaranteed success, depended highly on an external element: the programs used. And



this situation led to the creation of GNU/LinEx: one of the main success stories of the region.

The focus group of the SECTOR project, held in Extremadura had as focal point the future vision of the ICT sector, and shed light on the barriers that still exist in the region, many of them related to the need for a more market focussed view of the sector, as the next building blocks of the aforementioned strategy. A main issue of the development of a strong local ICT based sector but with global coverage in their services and applications, the strategy described shows the region is on the right road.

## **6. Conclusions**

When looking at the experience of Extremadura, considered an Objective 1 region in the European Union's regional policies, with an unemployment is 16.5%, it can be concluded that it has entered the 21st century in the best position ever in history. Economic indicators and the standard of living are growing year by year above the Spanish average, in fact in 2006 it was the third fastest growing regional economy in Spain.

Valuable lessons can be learned from this experience, mainly related to the implication of all relevant actors from the start of the process.

One of the keys to success in the strategy is the creation of a social and economic environment to sustain the work of public administration in the transition towards the Information and knowledge Society.

Several years of work, study and design were necessary to realise the turn around in strategy, the participation of practically all social sectors is considered as the collectivisation of a process, thus contributing to the success and credibility of the strategy.

In such a larger perspective, it can be seen that educational institutes, technological companies and traditional SMEs when co-actively interact with Public Administration might create or foster a strong technological sector. The interplay between all these groups of stakeholders aligned by regional ICT adoption policy and strategy in turn can result in creation of regional wealth.

Extremadura is on the map of international innovation for the first time, but this means not only maintaining what has already been achieved but also continuously expanding the actions to new areas, widening the initial plan focused on education and literacy.

The strategy drawn up in the early 90s has placed the region in a new unique social position in Spain where the entire population, in any location, is involved in the transition towards the knowledge society without actions that could give rise to new social exclusion.

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