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## Portuguese digital cities and regions: an evaluation

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## **Portuguese Digital Cities and Regions: an Evaluation**

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**Abstract:** This paper presents the main results of an in-depth pioneer research project in the study of digital cities and regions in Portugal. Unlike many other researches that subscribe a technocentric approach, in this research a more sophisticated theoretical framework was adopted focusing on institutional and organizational, as well as on technological factors that, in their inter-relation, influence the outcomes of the different cities and regions. Strengths and weaknesses of the digital cities and regions projects in Portugal are identified, comprising their conception and accomplishment. We also present a set of recommendations which can contribute to the debate and to social learning processes regarding policy formulation, project design and implementation as well as the practices of regional actors in Portugal and other countries of EU. Another primordial objective of the authors is to extend the theoretical and conceptual reflection; we propose namely that the digital cities and regions embrace a more adequate semantics, adopting the designation of knowledge cities and regions.

**Keywords:** digital cities and regions, knowledge-based development, governance, e-government, accessibilities, territorial competitiveness, regional innovation systems, networks.

## **Introduction**

The present paper presents the main results of the research “From the projects to the digital regions: which challenges?”<sup>1</sup> coordinated by the Centre of Social Studies of the University of Beira Interior (UBI\_CES) and financed by the Portuguese Operational Program for the Knowledge Society (POS\_C), whose implementation occurred from September 2006 to February 2008. In this research a transdisciplinary approach was adopted, supported by the expertise of researchers in sociology, regional economy and technology.

The general goal for this research was to deepen the knowledge on digital cities and regions in Portugal, and, taking into account the identified characteristics and tendencies, contribute to the rethinking of the model, the methodologies and the projects that gave origin to the digital cities and regions and its implementation in order to improve results, not only in Portugal as in other EU countries, particularly those that joined recently.

The specific objectives were: (i) to analyse the institutional and social factors, as well as the technological, that, in an inter-related way, contributed to different outcomes of the digital cities and regions; (ii) to identify the strengths and weaknesses found in the different dimensions considering the development of those cities and regions; (iii) to outline recommendations that can reinforce a knowledge-based development of those territories.

The purpose of this paper is, thus, on the one hand, to present the main results of a research concerning cities and digital regions in Portugal, and, on the other hand, to contribute to intensify the scientific debate on this issue and to confront our results with international ones, deepening the knowledge about this subject.

Given the purpose of the paper, the scope of the research and its various aspects, in a major effort of systematization, we start by presenting the main theoretical assumptions that guided the research and the methodology used. The second section presents the context in which the projects of digital cities and regions emerged, the main strengths and weaknesses identified and crucial recommendations. The recommendations are organized in six dimensions: governance, projects’ conception, approval and implementation, e-government, accessibilities, territorial

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<sup>1</sup> In this research project also participated Jan Wolf, Manuel Oliveira, Ricardo Campos, Alcino Couto, Margarida Vaz and Gäel Dias.

competitiveness and regional information system. The paper ends up with a final reflection, leaving some clues for further research<sup>2</sup>.

## **1. Debating around theory and methodology**

### **1.1. Theoretical framework**

We are faced not only with different analytical perspectives, theories and denominations about the accelerated changes of societies, but also with various designations of their distinctive features. There seems to be an agreement on only one issue: the impact of information and communication technologies (ICT) in contemporary societies. Such differences are reflected in the design of policies and programmes, the launch of various research projects and in the design and implementation of intervention projects, which necessarily lead to different results.

It is therefore not indifferent to the investigation to choose either one or another theory, because the choice poses and implies different challenges to the empirical research on digital cities and regions. That's why we need to briefly present the adopted theoretical framework.

We reject the technological determinism and use, instead, a more sophisticated model of analysis of the relationship between society and technology that Simões (1995, 2005) calls *reciprocal conditioning*. In this perspective the role of technology is not underestimated, because each one, given its characteristics, establishes an interrelation with social factors that condition it, resulting in different development paths. According to the adopted approach, the projects of digital cities and regions may succeed or not, depending on a wide range of social and technological factors.

The theory of the network society is based on above mentioned perspective. We choose this theory proposed by Castells (1998) and shared by Van Dijk (1999), Himanen (2001) and Barney (2004), among others, on one hand, because it seems to capture some essential aspects, although not all, of the phenomena we are witnessing in contemporary societies. The dominant

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<sup>2</sup> This paper is an on-going deeper reflection from SIMÕES, Maria João and SANTOS, Domingos (2008), "Challenges in the Digital Cities and Regions in Portugal" in Paul CUNNINGHAM and Miriam CUNNINGHAM (eds.), Collaboration and Knowledge Economy - Issues, Applications, Case Studies, Amsterdam: IOS Press, Vol. 5, Part 1, pp. 546-554.

functions and processes are increasingly organizing around networks that shape and condition the morphology of our societies (Castells, 1998). On the other hand, because it can be successfully articulated with regional innovation system theory and yet with knowledge cities and regions theory, having both a great heuristic importance to the empirical research.

For Barney (2004), the networks are made of nodes, ties and flows. A node is a distinct point (for example, a company or a R&D centre) connected at least to one other point, which in turn will be linked to other two or more points. The ties (for example, the connections via cable or satellite) connect the nodes. The flows (for example, information or knowledge) are what circulate among nodes and through the ties.

The nodes may be permanent or temporary, active, passive or reactive, or only net producers or receivers of different types of flows. The ties may be multiple or singular, strong or weak, dense or scarce, multidirectional or unidirectional, intersecting or parallel. The flows, in turn, can be constant or intermittent, abundant or scarce, reciprocal or one-way, multidirectional or unidirectional, significant or redundant.

Table 1 – Characteristics of networks according to territory types

|              | <b>Pro-active territories</b>                                 | <b>Passive territories</b>                               |
|--------------|---|--|
| <b>Nodes</b> | Permanent, active, net producers                              | Temporary, passive, receivers                            |
| <b>Ties</b>  | Multiple, strong, dense, multidirectional, intersecting       | Singular, weak, scarce, unidirectional, parallel         |
| <b>Flows</b> | Constant, abundant, reciprocal, multidirectional, significant | Intermittent, scarce, one-way, unidirectional, redundant |

Source: based in Barney (2004, 26-7).

But, if it's true that the networks are increasingly structuring the morphology of contemporary societies, and they are a necessary condition for economic, political and social activities of countries, they are not, however, a sufficient condition. The position that countries and regions occupy in the global society or the possibility to relocate will depend on the attributes that networks have. The more the characteristics of the nodes, ties and flows are similar to those listed into second row, the more the position of countries and regions will be strengthened; the

closer to those characteristics listed into third row, the more the countries and regions will be demoted economically, socially and culturally on a global level, as we can observe on Table 1. This can be explained by the fact stated by Himanen (2001: 167) that the networks operate in a binary logic: inclusion/exclusion.

The enunciated characteristics are also crucial when the territorial approach is broadened to regional innovation systems theories were also frameworks that guided the search carried out, as well as several publications of the authors of this article in the area of territorial development, namely Simões (2005b), Santos and Simões (2008) and Santos (2009).

During the last three decades, innovation, understood “in the broad sense to include product, process and organizational innovation in the firm as well as social and institutional innovation at the level of an industry, region and nation” (Morgan, 1997: 492), thus surpassing the strictly classical technological dimension, has become a key focal point on the analysis of territorial development.

As innovation processes have intrinsically a strong territorial and social matrix, then it must be emphasized the increasingly importance that an enlarged set of factors now assume in the production of knowledge for innovation, namely the informal contacts and the flows of tacit knowledge amongst the different kind of actors, their accepted rules, conventions and cultural patterns (Storper and Scott, 1995), their relational capital and their social capital, on the sense proposed by Putnam (1993: 35): “features of social organization, such as networks, norms and trust that facilitate coordination and co-operation for mutual benefit”. Thus, there has been a shift towards the understanding of the innovation process as a socially constructed mechanism based on the accumulation of knowledge (codified or tacit) through a continuous and interactive learning course (Lawson and Lorenz, 1999; Tura and Harmaakorpi, 2005). Accordingly, Maskell and Malmberg (1999: 20) argue that territorial competitiveness has nowadays, more than ever before, to do “with knowledge creation and with the development of localized capabilities that promote learning processes”.

In this sense, the innovation dynamics is based on resources that are place-specific, this is, “it is a localized, and not a placeless process” (Asheim and Isaksen, 1997: 299), so, regionally based complexes of innovation and production are increasingly the privileged instruments to harness and recreate knowledge and intelligence across the globe (Koschatzky, 2003; Santos, 2011).

More profound and lasting effects of increased competitiveness can only be obtained if innovation becomes systemic in the region, i.e. if it assumes a regional innovation system configuration, promoting the collective capability of interactive learning among the actors (firms, institutions and government agencies) which might positively influence the innovation performance of the regional economy.

Being presented some crucial theoretical assumptions of the perspective on social and technological change and the network theory, and yet of innovation regional system theory it is also important to define, at a more *meso* level, the concept used for cities and regions. Also at this level, there are several cities' and regions' theories, hence different ways of naming them: knowledge cities and regions, intelligent cities and regions, creative cities and regions, among others. This research focused on digital cities and regions in Portugal, a designation adopted by the POS\_C Program. However, in this study it was considered more adequate to adopt the concept of knowledge regions.

Based on Ergazakis' *et al.* (2006) concept of knowledge city, we argue that the concept of knowledge region is a comprehensive one, embracing all economic, social and cultural aspects of a region, concerning to regions that bet on a knowledge-based development, through processes which allow a continuous creation, diffusion, sharing, up-dating and evaluation of knowledge. This implies a permanent internal and external interaction of the citizens and the institutional and entrepreneurial actors of a certain region – a local collective dynamics coupled with a fruitful insertion on the worldwide circuits for information and knowledge diffusion. Various studies on the knowledge cities and territorial development and some theories in this field constituted a significant background for our research. Namely, the international experiences of cities studied by various authors in the book "Knowledge Cities - Approaches, Experiences, and Perspectives", coordinated by Carrillo (2006a).

Ergazakis *et al.* (2006) present distinctive characteristics shared by six knowledge cities: Barcelona, Stockholm, Munich, Montreal, Dublin and Delft. They point out the following successful critical dimensions: the existence of political and societal will; the possession of a strategic vision; the formulation of a strategic plan; the establishment of agencies that promote knowledge-based development; the international and multi-ethnic character of the city; the construction of an attractive and interactive site; the implementation of mechanisms to support innovation, value creation and financial support.

Carrillo (2006b), Martínez (2006) and Dvir (2006) also highlight the identity issue, pointing out that another characteristic of knowledge cities is strongly associated to the capacity to build a future trajectory of development according to their past and present identity. As the last author points out, each city is unique: in its history, its economic, political and cultural specificities, in the composition of its population and on the socioeconomic challenges it faces.

## **1.2. Methodological strategy**

In this research we adopted a qualitative and comparative methodology. The qualitative approach allowed us to identify, on a deeper level, the main strengths and weaknesses of the digital cities and regions. In order to do so and after of documental analysis of reports provided by the POS\_C management, we selected four different case studies: *Beja Digital*, *Évora Distrito Digital*, *Gaia Global* and *Leiria Região Digital*. That selection was based on the following criteria: projects covering different territorial realities (urban vs rural), with distinct characteristics on several analytical dimensions, such on the area of economic performance, institutional thickness, leadership, participation and networking, internal and external coherence of projects.

The comparative approach was used to identify differences and similarities of digital cities' and regions' projects as well as to study the causes that explain them.

According to the two methodological strategies used, the following research techniques were adopted: interviews (10 exploratory and 29 semi-directives); 15 websites' analysis and documental analysis (policy documents regarding the Knowledge Society on a national and EU level), as well as reports of the four case studies and of other digital cities and regions.

## **2. From programs to projects: opportunities, challenges and recommendations**

### **2.1. The programs, their changes and some reflections**

The Digital Cities Program was launched in Portugal in 1998 with the following main objectives: (i) to improve urban life, (ii) to fight peripherality, (iii) to reinforce economic competitiveness and employment and (iv) to support social integration and citizens with special needs (MCT, 1998). However, the concept of digital city was not defined in the context of that Program and the initiatives accomplished on its behalf were mainly directed towards e-



government, essentially focusing on the issues of infra-structuring, and on the area of accessibilities. Meanwhile, in July 2000, that Program became part of the Information Society Operational Program (POSI), following the orientations pursued on the eEurope Program. Later on, the POSI was redefined into the Knowledge Society Operational Program (POS\_C) and it was then that the POS\_C management team began to mobilise the project promoters to engage in larger territorial projects: the digital regions.

The digital city and region concept refers to a territory-based approach development; however, both on the European (see, for instance, the eEurope 2002 and the i2010 programs) and on the Portuguese policies, as on their instruments, there prevails a thematic or/and a sectorial approach of the knowledge society centred on eEducation, eResearch, eCommerce, eAccessibilities, among others.

Meanwhile, the POS\_C management launched in 2003 the so-called Operationalization Guide to Digital Cities and Regions in order to create a framework to guide the design and implementation of projects and in which a concept of digital city/region is already presented: "A digital city/region is a network of digital infrastructures, institutions and skills that support the development of social capital and the creation, accumulation and dissemination of knowledge about a particular territory. Its objectives are: (a) to strengthen the social capital of a region, (b) to stimulate continuous learning, and (c) to embed the information technologies in the daily routine of local government and civil society in order to enhance competitiveness via regional innovation systems, to improve the quality of life in urban and rural areas, to promote citizens' participation and to develop the economy of a geographic area in a sustained way" (POS\_C/UMIC, 2003:15).

The promoters of the digital cities and regions projects had to rely on that Guide to draw up their own projects, and their activities should be distributed by four dimensions of development: accessibilities, e-government, regional dynamization and infra-structures. In our research for a more interpretative analysis and as a proposal for next projects, a new analytical dimension was introduced and the previous four were reconfigured into: e-government, accessibilities, territorial competitiveness and regional information system. The regional dynamization for the knowledge society no longer is a project dimension, it is its main objective.

As the projects should be conceived in partnership and the promoter should be a supra-municipal entity, the new analytical dimension introduced was governance.

Issues such as leadership, strategic vision, social capital, accountability and the participation of the main stakeholders and of citizens are analysed in the context of the governance dimension taking into account Edgar *et al.* (2006), Barney (2004), Canet (2004) and other authors.

The accessibility issue was examined through a multidimensional concept of access (Van Djik, 2000, Simões, 2005), refuting a simplistic and technological deterministic approach according to the access to computers and the link to internet *per si* fight the info-exclusion, underestimating the crucial issue of uses.

In the e-government field the questions related to the back-office and front-office, as well as the administrative reorganization and participation were investigated basing namely on Fountain (2005); St-Amant (2005).

In the territorial competitiveness dimension, the qualification of the human resources, innovation and competitiveness were approached. Finally, in the regional information system issues on hardware and software, as well as the way in which the information is managed and distributed, were also studied.

Considering the policies for the knowledge society and what was stipulated in the Guidelines for Operationalization of the Digital Cities and Regions, how did the main stakeholders implement the projects and which results have they achieved? The results in Portugal are very different, although we can present some similarities also deepen in this section.

Firstly, the guide allowed to accomplish a territorial and articulated approach; however, as this approach was challenging isolated behaviours, opportunistic and fragmented practices, it was not welcome by a significant part of the actors that chose instead to ignore it.

Secondly, we can say that some regions have begun processes of knowledge-based development, although they are clearly in an embryonic process that requires support and deepening. We must, however, underline that the process has had no continuity, when the socialist government decided on 2008 to change some of his decisions: the pivotal role of the process, as well as the competences, will be assumed by deconcentrated bodies of the regional

administration (CCDRs). The know-how and experience gained on the process by some entities crumbled up and eventually disappear.

With the present coalition government composed by right and centre political parties the knowledge regions and cities don't seem to be a concern and are not part of the political agenda.

Finally, the most of project promoters had underlying a technological deterministic approach focusing their action principally into the infra-structuration of territories

## **2.2. Strengths and weaknesses of digital cities and regions**

The main strengths and weaknesses identified in the projects of digital cities and regions are presented below.

Table 2 – Mains strengths and weaknesses of the Portuguese digital cities and regions

|  |
|--|
| <p><u><i>Strengths</i></u></p> <ul style="list-style-type: none"><li>• The problematic of knowledge society was introduced in the local/regional political agenda;</li><li>• The effort on the infra-structuring of the territories;</li><li>• The significant cover of the regions with public access points that allowed the physical access to ICT;</li><li>• The mapping of existing institutional resources and the steps towards the promotion of dialogue channels among the actors and the, consequently, higher mutual knowledge;</li><li>• The emergence of leaderships in some regions with strategy and mobilization capacity;</li><li>• The capacity shown by some digital territories to promote the transferability and of social apprenticeship processes to others regions;</li><li>• The scale profits obtained with the new generation of projects that were implemented on</li></ul> |
|--|

a regional scope;

- The achieved advances in some e-government segments;
- The technological modernization of municipalities, even without having a parallel effort on the area of human resources qualifications;
- The induction of demand for specialized competences on the ICT area by municipalities, Association of Municipalities and other promoting entities.

### Weaknesses

- The difficulty of passing from a (e-)government to (e-)governance paradigm;
- The deficit of theoretical knowledge about the knowledge society, on the part of the majority of the territorial actors;
- The scarcity of strategic reflexion on most of the city and digital regions;
- The existence of very similar projects, despite the specificities of the regions – an isomorphic behaviour;
- The reductionism of the technocentric approaches and the excessive self-centredness of the projects;
- The verticalization/sectorialization of the interventions;
- The scarcity of relational culture and of the creation of collective learning dynamics;
- The deficit of organizational modernization in the municipalities and the absence of back-office and of information and services demand indicators;
- The lack of projects that reduce the various forms of info-exclusion to ICT access;
- The projects' scarce orientation to the entrepreneurial, scientific and socio-cultural sphere;
- The deficit of training of specialized human resources;
- The reduced impact in terms of direct and indirect employment;

- The lack of an evaluation culture in various projects;
- The difficulty in assuring the sustainability of several projects;
- The excessive municipalisation of projects;
- The potential of instability associated to political/parties and localist disputes.

### 2.3. Recommendations

The present recommendations aim to stimulate the debate and the social reflexivity of the regional actors, of the (new) management entities of this kind of projects, as well as of the political decision-makers responsible for territorial development policies in Portugal, as well as in other countries. Recommendations for the five dimensions of digital cities and regions and also for the project's conception, approval and implementation are presented.

Table 3 - Recommendations

#### Governance

1. It's crucial to substitute the (e) government paradigm by that of (e) governance and to create mechanisms that deepen the territorial strategic reflexion capabilities;
2. The constitution of partnerships in the new generation projects should demonstrate the participation of a wider and more representative range of actors (functionally and territorially), adopting a territorial governance system;
3. The policies for knowledge cities and regions must contain instruments of social, cultural, institutional and entrepreneurial animation according to their own specificities, with particular emphasis on identity issues;
4. It is fundamental to better articulate and integrate, at local and regional levels, the different sector policies (ICT, innovation, industrial, culture, education, ...);
5. It's crucial to stimulate a reflexive and co-operative attitude of the actors, emphasising the promotion of inter-institutional dialogue channels as an essential condition to avoid

fragmented interventions;

6. Leaderships must be able to mobilize and bare accountable the implicated actors and to position themselves above the political/parties and localist disputes;
7. To develop the creativity and innovation of the new generations, and also to attract and establish permanently knowledge workers in the territories, it's imperative to bet on the cultural dynamization, either intensively and extensively.

#### Conception, approval and implementation of projects

1. The projects should be inserted in the field of “knowledge society”, as it would be reducing to put them in the “administrative modernization” sphere. It would make more sense to treat them as “integrated projects”, making the approval dependent of pre-candidatures that provide high levels of information and are technically well sustained;
2. The pre-candidature should have the necessary time so that the diagnosis (i) is done obeying to thorough scientific and technical requirements, (ii) is adequate to the projects' goals, (iii) identifies which is the region' “level” on the path to knowledge society, through results already achieved in previous projects; (iv) indicates which are the mobilizable competences and the operative contributions to the project from the different social and entrepreneurial actors;
3. There should be a significant up-grading in the projects that reflects a passage:
  - from an information society to a knowledge paradigm;
  - from performances with a lack of strategic sense or short term strategies to interventions of structural nature;
  - from a sectorial to a territorial intervention;
  - from a vertical intervention to a transversal and wide range approach;
  - from a technocentric intervention to a socio-organizational approach;
  - from a technological to a knowledge-based management, which is centred on the promotion of citizenship and competitiveness;

- from the underestimation of the mechanisms of reflexion and supervision to the need to raise on-going mechanisms of evaluation and of strategic and prospective analysis;
- 4. The applications of digital cities and regions projects should be organized in accordance with five dimensions: governance, e-government, accessibility, territorial competitiveness and regional information system;
- 5. There should be a higher selectivity in the candidatures so that the approved projects with good performances can become examples of “good practices” for other territories;
- 6. It matters to include mechanisms of reinforcement of the processes of monitoring and evaluation that include not only input indicators, but also indicators of process, output and impact. These processes should be accomplished by qualified researchers, not only in evaluation techniques, but also in the field of the Knowledge Society;
- 7. The applications should be required to include a contribution to the reinforcement of the digital culture and of the competences of the citizens in the use of ICT;
- 8. A systematic and high level research must be equated about knowledge-based development of regions, as well as the periodical promotion of forums of analysis and discussion between the academic/research area and the institutional/entrepreneurial universe.

#### Accessibilities

1. The projects should include activities that mobilize the more excluded people to public access points, in order to reduce physical access inequality to ICT;
2. It's important to include in the projects activities that minimize inequalities that can be increased in the field of competences to the physical access to ICT and in the use of applications;
3. It's necessary to rethink the projects in order to include activities that promote qualified uses of ICT, which implies significant and effective articulations between the regional actors.

## E-Government

1. The information of municipalities' websites should adjust more to the needs of the users and it is also necessary to give differentiated answers according to the main specificities of the different users: citizens, enterprises, associations, and others.
2. It is important to develop mechanisms to stimulate and to allow the participation of citizens in the public cause;
3. It would be important to bet on the maturity of the on-line services, namely in bidirectional and transactional services;
4. A set of indicators should be defined and used for a more adequate evaluation of the e-government back-office and demand;
5. The technological modernization of the municipalities should be carried along the processes of organizational change, and also adjusted to the specific needs of each municipality;
6. In the field of administrative modernization we must "turn the page" to projects whose results show basic, medium and mostly advanced formation of the staff;
7. For an effective appropriation of competences, the municipalities should enlarge the permanent staff specialized on ICT.

## Territorial Competitiveness

1. To enlarge the strategic partnerships to the entrepreneurial sphere in order to enrich the economic contents of the projects, so as to adjust them to the demand dynamics, and mobilize reference actors to the new competitiveness challenges;
2. To improve the production of innovation, mainly by creating networking mechanisms between entrepreneurial, technological and academic players, according to a logic of activation and dynamization of clusters on a regional basis and the promoting of new technology based firms;
3. To raise mechanisms of extensification concerning the need to activate and stimulate latent demands in matters of technological and organizational upgrading – especially in



more peripheral areas.

### Information system

1. It's absolutely crucial to assure the appropriation of competences in matters of ICT, on its core technological dimensions, avoiding the threat of an excessive external services sub-contracting;
2. The building of regional and local websites should be based on needs and specificities of the different target groups rather than on the supply possibilities, and on making the information and the available services more attractive and interactive;
3. It is important to bet on regional websites that reflect regional vision, strategy and the specificities of the region, that mobilize partners and population, that encourage more interactivity and that are more than just a "sum" of the websites of municipalities and of other partners;
4. The information system should be settled in a multi-channel strategy displaying the diverse use of communication channels compatibles with the daily practices of the populations;
5. The new cities' and regions' projects should enhance the reutilization and use of the existing infra-structures, namely the Digital Technologies Centre (DTC) built in the projects of the last program generation and that could be more profitable on a higher geographic scale, particularly in the less developed regions;
6. It would be important to raise the level of integration of the different entities so as to allow points of unique access to the user. To do this, it will be necessary to move towards an encompassing notion of interoperability that alongside standardization of technological solutions also includes the organizational dimension.

### **Final reflections**

The position that countries and regions occupy or will occupy in the global society, or the possibility they have to reposition themselves, will depend, as mentioned, on the attributes of

their networks, depending these on characteristics of the nodes, ties and flows. In this increasingly globalised world, where cities and regions are becoming progressively more crucial socio-economic development players, the nodes of networks - social actors, particularly the collective ones - will be eventually decisive and may, in a process that is difficult and complex, make a difference in the regions, making them winners or losers, depending on their institutional capacity, and also on the kind and quality of ties and flows they are able to formulate and implement.

There are no standard solutions and those regions that want to be successful in the process of knowledge-based development should act/react in different ways, depending on the specificities of their history, culture and institutions.

It is also important to reaffirm that ICT are not but a mere facilitator tool, they do not predetermine any kind of development; they do not prescribe a knowledge-based development. In that sense, it was suggested that the designation of digital cities and regions should be replaced by knowledge cities and regions. The term digital, in our opinion, refers implicitly to a technologically deterministic perspective that has several consequences, namely the appropriation of that sense of the word by the actors present in different regions, which will have its impacts, particularly in an intervention almost exclusively focused on infrastructure and technological responses. As repeatedly emphasized by Barney (2004), names have all the importance. When awarded, they not only describe, but also prescribe, or make things happen...

What differentiating marks highlight the cities and regions that begin to be "winners", from those that have failed to embark on these upgrading trajectories? This research project has confirmed the relevance of characteristics of knowledge cities and regions already identified in international experiences by other researchers. We can describe synthetically (i) the existence of political will and commitment; (ii) the development of strategic diagnosis adjusted to the specific geographic contexts; (iii) a well defined framework to guide action with clear priorities, assuming the social, economic and cultural specificities as differentiating features regarding other regions; (iv) the creation of mechanisms to stimulate innovation and support the creation, dissemination and sharing of knowledge; (v) the possession of qualified human resources and an attractive and conducive context aiming at capturing knowledge workers; (vi) the existence of a dynamic leaderships; (vii) the building of effective, strategic and diversified

partnerships; (viii) the skills concerning the management, organizational and marketing challenges.

This research constituted a point of arrival due to the contributions given to a more systematic awareness of the knowledge regions and the various analytical dimensions studied. It was also a point of departure because it is crucial to pursue and deepen the theoretical reflection and the empirical research in order to increase and consolidate our understanding about these regions. This will, certainly, enable the acquired knowledge to better systematize the dimensions of the concept of knowledge city or region, a necessary step to move, on a more sustainable way, to the development of indicators. Only with these monitoring and evaluating tools will we then be able to assess the "status" of a region, concerning all this dynamics of upgrading towards the knowledge society and all its challenges. The available indicators so far are predominantly fragmented in nature and based on the assumptions of technological determinism, not responding to several social aspects which are essential for the development of the regions, as we verified along the research.

## References

- Asheim B. T. and Isaksen, A. (1997), "Location, agglomeration and innovation: towards regional innovation systems in Norway?", *European Planning Studies*, vol. 5(3), 299-330.
- Barney D. (2004), *The Network Society*, Cambridge: Polity Press.
- Canet, Raphaël (2004), "Les Nouveaux Modes de Gouvernance et la Place de la Société Civile", in *Conférence de la Chaire MCD*, Montréal.
- Carrillo, F. J. (Ed.) (2006a), *Knowledge Cities – Approaches, Experiences, and Perspectives*, Oxford: Butterworth-Heineman.
- Carrillo, F. J. (2006b), "A Taxonomy of Urban Capital", in Francisco Javier Carrillo (Org.) *Knowledge Cities - Approaches, Experiences, and Perspectives*, Oxford: Butterworth-Heineman, pp.43-58.
- Castells, M. (1998), *The Rise of the Network Society*, vol. 1, Oxford: Blackwell (7th ed.
- Dvir, R. (2006), "Knowledge city, seen as a collage of human knowledge moments", in Francisco Javier Carrillo (Org.) *Knowledge Cities - Approaches, Experiences, and Perspectives*, Oxford: Butterworth-Heineman, pp.245-272.
- Edgar, Laura et al (2006), *Partnerships: putting good governance in practice*, Institute on Governance, available in [http://www.iog.ca/publications/2006\\_partnerships.pdf](http://www.iog.ca/publications/2006_partnerships.pdf) [2007].

Ergazakis K., Metaxiotis K. e Psarras J. (2006), “An emerging pattern of successful knowledge cities’ main features”, in Francisco Javier Carrillo (Org.) *Knowledge Cities – Approaches, Experiences, and Perspectives*, Oxford: Buterworth-Heineman, pp. 3-15.

Fountain, J. E. (2005), *Central Issues in the political development of the virtual state*, available in [http://www.umass.edu/digitalcenter/research/pdfs/jf\\_portuagl2005\\_centralissues.pdf](http://www.umass.edu/digitalcenter/research/pdfs/jf_portuagl2005_centralissues.pdf) [2008].

Himanen P. (2001), *The Hacker Ethic – and the Spirit of the Information Age*, London: Secker & Warburg.

Koschatzky, K. (2003), “The regionalization of innovation policy: new options for regional change?”, in Fuchs G. and Shapira P. (eds), *Rethinking Regional Innovation: Path Dependency or Regional Breakthrough?*, London, Kluwer.

Lawson, C. and Lorenz, E. (1999), “Collective learning, tacit knowledge and regional innovative capacity”, *Regional Studies*, vol. 33(4), 305-317.

Martínez, S. D. (2006), “A Comparative Framework for Knowledge Cities”, in Francisco Javier Carrillo (Org.) *Knowledge Cities - Approaches, Experiences, and Perspectives*, Oxford: Buterworth-Heineman, pp. 17-30.

Maskell, and Malmberg, A. (1999), “The competitiveness of firms and regions: “ubiquitification” and the importance of localized learning”, *European Urban and Regional Studies*, 6(1), pp. 9-25

Morgan, K. (1997), “The learning region: institutions, innovation and regional renewal”, *Regional Studies*, 31(5), 491-503.

MCT (Ministério da Ciência e Tecnologia) (1998), *Programa Cidades Digitais*, available in <http://www.fct.mct.pt> [2000].

OECD (2004), *Principles of Corporate Governance*, available in <http://www.oecd.org/dataoecd/32/18/31557724.pdf> [2008].

POS\_C/UMIC (2003), *Guia de Operacionalização Cidades e Regiões Digitais*, Lisbon: POS\_C/UMIC.

Putnam, R. (1993), “The prosperous community. Social capital and public life”, *The American Prospect*, 13, pp. 35-42.

Santos, Domingos; Simões, M<sup>a</sup> João (Coords.) (2008), *Dinâmica Socioeconómica da Fileira da Madeira em Concelhos do Pinhal Interior Sul: uma Análise em Torno do Conceito de Meio Inovador*, University of Beira Interior, Covilhã: UBI.

Santos, Domingos (2009), “Teorias de inovação de base territorial”, in Costa, J. and Nijkamp, P. (Coord.). *Compêndio de Economia Regional – Teoria, Temáticas e Políticas*, Cascais: Pricipia, pp. 319-352.

Santos, Domingos (2011), *Dinâmicas Territoriais de Inovação no Arco Urbano do Centro Interior – o Caso do Sector Têxtil-Confecções*, Famalicão: Húmus.

Simões, M<sup>a</sup> João (2005a), *Política e Tecnologia - Tecnologias da Informação e da Comunicação e Participação Política em Portugal*, Oeiras: Celta Editora.

Simões, M<sup>a</sup> João (Coord.) (2005b), *Empresarialidade em Territórios de Baixa Densidade*, Castelo Branco: NERCAB,

Simões, M<sup>a</sup> João (1995), “Mudança Tecnológica e Mudança Social: o caso das Tecnologias da Informação”, *PACP (Scientific report)*, Covilhã: UBI, printed.

St-Amant, Gilles (2005), “E-gouvernement: cadre d’évolution de l’administration électronique”, *Systèmes d’Information et Managemen*, vol. 10, n°1, ABI/INFORM Global, pp. 15-39.

Sorper, M. and Scott, A. (1995), “The wealth of regions”, *Futures*, 27, pp. 505-526.

Tura, T. and Harmaakorpi, V., (2005), “Social capital in building regional innovative capability”, *Regional Studies*, vol. 39, 1111-1125.

Van Dijk, J. (2000), “Widening information gaps and policies of prevention”, in Kenneth Hacker e Jan van Dijk (Orgs.) *Digital Democracy*, London: Sage, pp. 166-183.

Van Dijk (1999), *The Network Society*, London: Sage.