



Innovation for Resilience

Editors
Teresa de Noronha
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Table of Contents

LIST OF FIGURES.....	6
LIST OF TABLES.....	8
AUTHORS.....	9
CHAPTER 1	
Resilience for Innovation – A Research Agenda	
<i>Hugo Pinto, Teresa de Noronha.....</i>	11
CHAPTER 2	
The Adaptive Territorial Management - Design a Management System towards a Resilient Urban Development	
<i>Luís S. Grave.....</i>	17
CHAPTER 3	
(Re)Organisation of Public Service Networks in Portugal from the Perspective of Territorial Resilience and Cohesion	
<i>Ricardo Tomé, José Afonso Teixeira, Margarida Pereira.....</i>	45
CHAPTER 4	
Cooperation or Firm-Based Innovation? Evidence from the Portuguese Economy	
<i>Sílvia Fernandes, Marisa Cesário, Bruno Jesus, José Monteiro Barata.....</i>	77
CHAPTER 5	
Innovation towards more Resilient Territories: a Case Study from the Serra da Estrela, Portugal	
<i>Carolina Alves, Adélia N. Nunes, Joana Silva.....</i>	97
CHAPTER 6	
The Uses of Knowledge in the Hospitality Industry: Three Case Studies in the Algarve	
<i>Bernadete Dias Sequeira, João Filipe Marques, António Serrano.....</i>	125
CHAPTER 7	
Bottom-up Initiatives of Economic and Symbolic Innovation in Oporto City Centre	
<i>Célia Marisa Fonseca Ferreira, Teresa Sá Marques, Paula Guerra.....</i>	149
CHAPTER 8	
Technological Learning: Experience Curve as a Resilient Learning Mechanism	
<i>Teresa de Noronha, Victoria del Pino.....</i>	169

List of Figures

CHAPTER 2	
Figure 1 – Location of urban perimeters under analysis.....	19
Figure 2 – Illustration of trends.....	21
Figure 3 – Urban occupation in AML.....	25
Figure 4 – Graphic average budget trend territorial impact to the LMR 2002-2011.....	28
Figure 5 – Diagram of the multi-functionality and integrated assessment of sustainable urban system.....	30
Figure 6 – Hierarchicalisation of planning.....	33
Figure 7 – Exemplification of the integrated assessment, structure of economical sustainability indicators and its rational descriptors.....	38
Figure 8 – Matrix of the core functions of the integrated strategic land management system.....	39
Figure 9 – Planning cycles within the adaptive territorial management system.....	40
Figure 10 – Structure of balanced indicators for performance assessment.....	42
CHAPTER 3	
Figure 1 – Response capacity models for a regional economic system.....	54
Figure 2 – Evolution of public services in Portugal (1975-2015) - a summarised vision.....	57
Figure 3 – Location of public services, by type, in CS1 (2015).....	67
Figure 4 – Location of public services, by type, in CS2 and CS3 (2015).....	68
CHAPTER 4	
Figure 1 – Scale and scope of cooperation in the Computer sector.....	89
Figure 2 – Scale and scope of cooperation in the Civil engineering sector.....	89
Figure 3 – Scale and scope of cooperation in the Retail trade sector.....	90
Figure 4 – Scale and scope of cooperation in the Insurance sector.....	91
Figure 5 – Scale and scope of cooperation in the R&D sector.....	91
Figure 6 – Scale and scope of cooperation in the Health sector.....	92
CHAPTER 5	
Figure 1 – Location of the municipality of Manteigas and the Penhas Douradas Hotel and Burel Factory.....	100
Figure 2 – Process of resilience: interactive elements in mountain rural areas.....	103
Figure 3 – Process of resilience: dynamics in creation of resilient territories.....	105
Figure 4 – Residence of the population employed in the different business niches of the Casa das Penhas Douradas.....	110
Figure 5 – Human and social capital in the process of resilience.....	112
Figure 6 – Individuals who intended to remain in the municipality in case of unemployment before being hired by Casa das Penhas Douradas.....	115
Figure 7 – Potential situation regarding employment and place of residence in case they were not hired by Casa das Penhas Douradas.....	116
Figure 8 – Potential situation regarding unemployment and in case they were not hired by the Casa das Penhas Douradas and unemployment situations prior to hiring.....	116
Figure 9 – Territorial networks of the company by type of relationship.....	119
Figure 10 – Network elements of Penhas Douradas Hotel and Burel Factory: fields, dynamics and contributions of partnerships.....	120
CHAPTER 6	
Figure 1 – Encouraging creativity: Group A.....	137
Figure 2 – Procedure before a problem (N = 216): Group A.....	137
Figure 3 – Stimulate the use of knowledge: Group A.....	138
Figure 4 – Encouraging creativity: Group B.....	140
Figure 5 – Procedure before a problem (N = 167): Group B.....	141
Figure 6 – Stimulate the use of knowledge: Group B.....	142
Figure 7 – Encouraging creativity: Group C.....	143
Figure 8 – Procedure before a problem (N = 66): Group C.....	144
Figure 9 – Stimulate the use of knowledge (N = 65).....	144
CHAPTER 7	
Figure 1 – Framework of triple, quadruple and quintuple helix models.....	152
Figure 2 – Location of Oporto and its centre.....	159
Figure 3 – Old and new economic activity establishments in Oporto city centre.....	162
Figure 4 – Homepage of internet pages of bars / nightclubs with cultural activities.....	162
Figure 5 – Urban markets in Oporto city centre.....	163
CHAPTER 8	
Figure 1 – Technological discontinuity	174
Figure 2 – Cost of electricity, electricity produced and PR from selected electric technologies installed in the EU, from the year 1980 to the year 1995 (NGCC stands for Natural Gas Combined Cycle).....	176

List of Tables

CHAPTER 3	
Table 1 – Evolution of public services in recent decades.....	47
Table 2 – New forms of provision of public services of an administrative nature.....	48
Table 3 – Evolution of supply and demand by level of education in Portugal.....	58
Table 4 – Evolution of some indicators for the health system in Portugal.....	60
Table 5 – Evolution of the number of courts, by type.....	61
Table 6 – Public service facilities (no. and %), by service group and by territory type in Mainland Portugal.....	64
Table 7 – Public services, by service groups and by case study (2015).....	66
Table 8 – Respondents whose household members have used public services in the last two years.....	69
CHAPTER 4	
Table 1 – Innovation sources.....	81
Table 2 – Sample distribution by sector in CIS 2012 instrument.....	85
Table 3 – Variables for product/service innovation.....	86
Table 4 – Variables for process innovation.....	86
Table 5 – Cooperation-based vs firm-based innovation.....	87
Table 6 – Cooperation-based vs. firm-based innovation by sector.....	88
CHAPTER 5	
Table 1 – Sociodemographic comparison of the municipality of Manteigas in 1960 and 2011.....	101
Table 2 – Characterization of the population employed in the different business niches of the Casa das Penhas Douradas.....	111
Table 3 – Population unemployed or at risk of unemployment immediately prior to being hired by Casa das Penhas Douradas.....	113
Table 4 – Residence perspectives for the workers of Casa das Penhas Douradas in case they were not employed there.....	114
Table 5 – Perspectives regarding the employment of Casa das Penhas Douradas workers in case they were not working there.....	117
CHAPTER 6	
Table 1 – Use of knowledge activities.....	132
Table 2 – Sample of semi-structured interviews.....	133
Table 3 – Stratified sampling of the study.....	133
CHAPTER 8	
Table 1 – Organisational learning mechanisms.....	172

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CHAPTER 1

Resilience for Innovation – A Research Agenda

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Teresa de Noronha

Introduction

Last decade is characterized by different types of crises and shocks in the socioeconomic systems, creating a turbulent context and calling for a better understanding of what the dynamic perspective of change is. For countries, regions and cities a better understanding of governance urges and calls for action.

Resilience is gaining attention in social sciences, in general, and in regional studies, in particular. The concept has been particularly useful to rethink regional development models in the European Union when integrating the contribution of innovative dynamics in regional strategies and also in considering prevention and planning environmental, socio-economic and technological risks.

Resilience is commonly characterized by having an engineering perspective, if focusing the return to a steady-state equilibrium, and an ecological perspective, if paying more attention to the carrying capacity of the system as it absorbs shocks without losing its properties (Simmie & Martin, 2010). Today's use of the "resilience" metaphor in social sciences requires careful considerations to avoid frequent fuzzy meanings (Davoudi et al., 2012). The Evolutionary Economic Geography School suggests connecting the concept to ideas that allow reflecting how different socio-economic systems at different scales are able of withstanding, recovering, re-orientating and renewing themselves when confronted with external disruptions or internal systemic failures. In this way resilience is being debated integrating an evolutionary approach (Boschma, 2015) and demonstrating how complex systems adapt and evolve. The vision of complex adaptive systems is very rich as it facilitates to clarify the emergent characteristics at multi-level interactions (Cooke, 2012), uncovering, for example, the mechanisms that enable top-down and bottom-up change linking territories at different levels, with systems and networks, with specific organisations, their behaviours, routines and incentives. It is clear that resilience, and regional resilience in particular, require effective innovation systems (Simmie, 2014) as innovation is a central aspect of the adaptation and adaptability of territories. The micro-determinants of resilience are crucial, connected with the dynamic capabilities of organizations (Teece, 1999).

For resilience consideration, the Public Sector plays a crucial role. The State has a crucial role in the coordination and governance of market exchange and it is central to create the institutional architectures that create advantages in some cases (Hall & Thelen, 2009). The State

is an inducer of innovation and new activities, both by supporting and enforcing new legislation but also by public procurement, acquiring products that stimulate other economic agents (Uyarra et al. 2013).

Organization of the book

This book is a contribution to the debate of resilience applied to the Portuguese case. Organized in eight chapters, several contributions from the Portuguese reality are gathered on topics such as the definition of policies for resilient territories, supply networks of public services, innovation in enterprises. Knowledge management in the tourist industry, resilience in rural areas, urban regeneration strategies, and technological learning as an organizational resilience mechanism are explored as well.

After the introductory chapter, in chapter 2 Luís Grave underlines that the development of complex urban systems is subject to various factors influenced by the objectives of the established territorial policies or urban development agents. There are potential risks and impacts of land use in result of external factors adverse to set goals and desired dynamics. It is necessary to prevent and overcome these harmful effects through adaptive management of land use management able to anticipate and consider preventively, possible future scenarios contraries to set development strategies and set safer development goals or adopting strategic adjustment measures in order to avoid harmful dynamic of the constant balancing of the urban system. How to configure this management is the challenge. As a starting point and basis for this approach, the author found an area on the south bank of the Tagus estuary suffering from a context of stagnation after an abrupt stop of the rapid urban growth that was occurring, induced by construction of the 'Vasco da Gama Bridge'. From the impacts on land use this chapter went to seek the necessary responses in terms of mechanisms and procedures that should be included in land management so that it can avoid such adverse effects. In the end, it identifies the potential benefits that could result, if applied in the same context, through the proposed adaptive land use management system model.

Chapter 3 by Ricardo Tomé, José Afonso Teixeira and Margarida Pereira debates the relevance of public services which due to their universal and inclusive character mitigate social inequalities, foster economic growth and bring populations and territories closer, also making them more resilient and cohesive. In Portugal, after restoring a democratic regime (1974), joining the EEC/EU (1986) and, at a different level, information and communication technological innovation, have contributed to the expansion and modernisation of public services. The extension of compulsory schooling and the opening of access to higher education, the creation of the National Health Service and the democratisation of justice have required expanding the respective networks of facilities, technological innovation and suitable training. Public administrative services have been restructured, formats diversified, technology incorporated and networks integrated. Neoliberalism and the economic and financial crisis (2008) weakened the Welfare State through the sub-contracting of services, rationalisation of resources, defence of contracting models and privatisation. This chapter reflects on the role of public services in territorial resilience and cohesion, showing the changes in the public services for education, health, justice and

administration in Portugal and some reorganization consequences of the crisis. Based on three case studies, it also analyses patterns of the use of services in different geographical contexts (densely urbanised, rural and transition territories).

In chapter 4 Sílvia Fernandes, Marisa Cesário, Bruno Jesus and José Monteiro Barata identify the sectors of the Portuguese economy that most participate in cooperation to innovate and which sources/agents are most used in the process, observed by sector and type of innovation. Using the data from the Community Innovation Survey (CIS-2012), it first appraises the nature of the innovation process in terms of cooperation or firm-based innovation, and then differentiates the results by sector illustrating which cooperation sources/agents are most used (scope) and relative intensity (scale). The results suggest that main innovating sectors in the Portuguese economy are research-based, knowledge-based, and service-based. The external sources/agents most commonly used by the first are universities, suppliers by the second and firms' group by the third. Private customers are important sources in general, what means that Portuguese firms use customers' information and market relations for innovation purposes. These results are in line with the fact that Portuguese firms are mainly small and medium-sized (SME) and increasingly focused on services and knowledge.

Carolina Alves, Adélia Nunes and Joana Silva describe the case of Serra da Estrela in chapter 5. As a mountainous area, characterized by low density of population with an eccentric position, remote and associated to physical and natural constraints, the construction of more resilient territories can become a path towards the stimulation of development. The main issue of this work is to understand in what way the fixing of specific business constitutes a structuring element of social and ecological resilience. Through the valorization of human resources and improvement of potentialities of this territory such as local products, environment and landscape, the widening and diversification of the offer arises. However, bottlenecks are still to be considered such as the non-convergence with other local business hinders the creation of a more cohesive, competitive and resilient territory.

Chapter 6, by Bernadete Dias Sequeira, João Filipe Marques and António Serrano, presents some of the main results of a research about knowledge management in the hospitality organisations in the Algarve region. Its main goal is to understand, from a sociological perspective, how hotels create or acquire, retain, share and use their organizational knowledge. A comprehensive model of analysis providing an integrated overview of knowledge management was specially developed for this goal. The model is organized around two analytical axes: the first identifies the main steps of the knowledge management process (creation/acquisition, storage, transfer and use) and the second lists and describes the management practices that facilitate this process. Given that innovation is a very important outcome of knowledge management as a whole, this chapter focus on the last dimension, the use of organizational knowledge. The empirical research consists in three case studies of hotel groups operating in the Algarve, using semi-structured interviews to the hotel's managing staff and a survey administered to a stratified sample of employees.

In chapter 7, Célia Marisa Fonseca Ferreira, Teresa Sá Marques and Paula Guerra underline that the structure and organization of economy of cities results from both individual actions of many economic agents (individuals, families, business, government institutions, diversified organizations) and from the network of relationships established between them. The authors

used 24 interviews to retail sector business promoters and economic-oriented initiatives developers, carried out during 2015, to understand the motivations, expectations and difficulties involved in opening of business or conducting initiatives, the location factors, the partnerships and institutional support, as well as aspects related to innovation in the city centre of Oporto. This analysis contributes to the studies of bottom-up initiatives in the context of economic development, and thus support the delineation of private sector strategies as well as help to support delineation of public policies.

In the final chapter 8, Teresa Noronha and Victoria Del Pino emphasize the need for going back to the classical methods of considering the savings that repetitive processes introduce in the learning process of firms. Cumulative experience leads to performance improvement and may fill part of the existing knowledge gap based upon the Experience Curve (EC). The Microalgae Production Systems (MPS) was used for this research considering that it is one of the most exciting future-oriented business areas of modern biotechnologies, which have turned into an important global industry, with a diversified field of applications. Thus, the particularities of learning and experience accumulation processes have been used to conclude about the behaviour variations of the EC, by exploring and detecting some applications and misapplications of the concept. The research methodology is based on the case-study of Necton S.A., a pioneer Portuguese firm, dedicated, since 1997, to microalgae cultivation. Prior to this chapter, an in deep research of these authors attempted to understand the technical complexity of microalgae biotechnology. The conclusions emphasized in this chapter confirm that: i) the different MPS follow an experience curve, with progress ratios which are in between the ones determined for manufacturing firms and energy technologies; ii) the learning mechanisms play a similar role through the technologies life-cycle, although the MPS studied are different in technological complexity; and, finally and most important, iii) learning-by-doing is more relevant in early technology stages, learning-by-using appears to be fundamental in the maturity stage, and learning-by-searching is critical to solve particular technical constraints. This perception is very useful in the design of target strategies for innovation under constrains such as financial disruptive or economically lagging environments.

A research agenda

It is expected that different types of shocks, socio-economic, demographic, technological, environmental, financial, will accelerate, uncovering the deficits and structural problems of contemporary society. Resilience can become a critical area of research related to risk management and facilitating the deep comprehension and intervention in a changing environment. The results presented in this book confirm the fast-growing literature in the topic, highlighting three relevant fields for the Resilience research agenda:

- Resilience and innovation - studying how innovation increases at a multi-level perspective the resilience of different systems. This will necessarily include the studies of different national configurations that are more friendly and supportive of innovation (Amable & Lung, 2008), different systems and network configurations that create eco-systems

that are entrepreneurial and enhancers of knowledge production and exchange (Balland, Suire, & Vicente, 2013), the policies for stimulating a smart specialisation (Foray, David, & Hall, 2011) and the capabilities of firms and other key innovation actors (OECD, 2009).

- Resilience and risk – shocks and internal disruptions need to be addressed. The studies of risk management, especially relevant in urban and territorial physical planning, will include necessarily new dimensions of socio-economic and technological resilience (Alexander, 2013; Allan & Bryant, 2012; Dawley, Pike, & Tomaney, 2010).
- Resilience and territorial renewal – territories are living organisms that develop and grow but may also degenerate and die. Policy-makers and research will pay particular attention to the mechanisms that can increase the life-cycle of specific clusters (Ebbekink & Lagendijk, 2013), that can increase the competitiveness and cohesion of economic base (Bristow, 2010), increase proximity and related variety (Frenken, Van Oort, & Verburg, 2007), and stimulate the factors of uniqueness and that guarantee a long-standing place in the global economy.

The book hopes to contribute to the consolidation of the concept of resilience, both in scientific research and territorial planning. Useful to researchers and students, it supplies a diversified and balanced selection of cases related to management and promotion of territorial development in difficult conditions. Portuguese regional reality exposed and discussed in deep, thus, became a promising field of study *per se*.

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References

- Alexander, D. E. (2013). Resilience and disaster risk reduction: an etymological journey. *Natural Hazards and Earth System Science*, 13(11), 2707–2716. doi:10.5194/nhess-13-2707-2013
- Allan, P., & Bryant, M. (2012). Resilience as a framework for urbanism and recovery. *Journal of Landscape Architecture*, 6(2), 37–41.
- Amable, B., & Lung, Y. (2008). The European Socio-Economic Models of a Knowledge- based society. Main findings and conclusion. *Cahiers Du GREThA*, 33(0).
- Balland, P.-A., Suire, R., & Vicente, J. (2013). Structural and geographical patterns of knowledge networks in emerging technological standards: evidence from the European GNSS industry. *Economics of Innovation and New Technology*, 22(1), 47–72. doi:10.1080/10438599.2012.699773
- Boschma, R. (2015). Towards an evolutionary perspective on regional resilience. *Regional Studies*, 49(5), 733–751. doi:10.1080/00343404.2014.959481
- Bristow, G. (2010). Resilient regions: re-‘place’ing regional competitiveness. *Cambridge Journal of Regions, Economy and Society*, 3(1), 153–167. doi:10.1093/cjres/rsp030
- Cooke, P. (2012). *Complex Adaptive Innovation Systems: Relatedness and Transversality in the Evolving Region*, Routledge.
- Davoudi, S., Shaw, K., Haider, L. J., Quinlan, A. E., Peterson, G. D., Wilkinson, C., ... Mcevoy, D. (2012). Resilience: A Bridging Concept or a Dead End? “Reframing” Resilience: Challenges for Planning Theory and Practice Interacting Traps: Resilience Assessment of a Pasture Management System in Northern Afghanistan Urban Resilience: What Does it Mean in Planni. *Planning Theory & Practice*, 13(2), 299–333.
- Dawley, S., Pike, A., & Tomaney, J. (2010). *Towards the Resilient Region?: Policy Activism and Peripheral Region*.
- Ebbekink, M., & Lagendijk, A. (2013). What’s Next in Researching Cluster Policy: Place-Based Governance for Effective Cluster Policy. *European Planning Studies*, 21(5), 735–753. doi:10.1080/09654313.2013.734460
- Foray, D., David, P. A., & Hall, B. H. (2011). Smart specialization From academic idea to political instrument , the surprising career of a concept and the difficulties involved in its implementation (No. 2011-001).
- Frenken, K., Van Oort, F., & Verburg, T. (2007). Related Variety, Unrelated Variety and Regional Economic Growth. *Regional Studies*, 41(5), 685–697. doi:10.1080/00343400601120296
- Hall, P. a. P. P. a., & Thelen, K. (2009). Institutional change in varieties of capitalism. *Socio-Economic Review*, 7(August), 7–34. doi:10.1093/ser/mwn020
- OECD. (2009). *Innovation in Firms: A Microeconomic Perspective*.
- Simmie, J. (2014). Regional Economic Resilience: A Schumpeterian Perspective. *Raumforschung Und Raumordnung*, 72(2), 103–116. doi:10.1007/s13147-014-0274-y
- Simmie, J., & Martin, R. L. (2010). The economic resilience of regions: towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society*, 3, 27–43.
- Teece, D.J. (2009), “Dynamic Capabilities and Strategic Management”, Oxford: Oxford University Press.
- Uyerra, E., Edler, J., Gee, S., Georghiou, L., Yeow, J. (2013). “Public procurement for innovation: the UK case.” In *Public procurement for innovation: the UK case* Public procurement policy for innovation, Springer, 2013. eScholarID:212706

CHAPTER 2

The Adaptive Territorial Management - Design a Management System towards a Resilient Urban Development

Luís S. Grave

Introduction

The Issue

The urban system is a permanent complex construction, with the aim of conditioning society, its culture and activities more susceptible to various influences and constraints. Induced dynamics occur within its development, determined both by prior planning, and by unforeseen and adverse externalities to thought out plans, leading to instabilities or even processes with a negative tendency. This was the case with the recent economic and financial crisis which resulted in a context of stagnation or even recession for urban development in the consolidated city and the urban space in expansion or consolidation. The findings here are reflected in the following statement of amazement: could it be that nobody foresaw this, and why? It is my belief that it indeed matters that policy in general and spatial planning as governance of cities acquires the capacity to foresee, as far as possible, the distant consequences of its own decisions and the effects of externalities on urban development, that is, that for a sustainable and resilient urban development, this can be carried out using a permanently adapted strategy for a preventive and not merely positivist prospective.

However, the city, from the territorial point of view, consists of an urban system with a complex multifunctionality and structure. Therefore, in order to achieve the aforementioned governance of sustainable and resilient cities, this should be supported by a management system capable of efficiently managing that complexity. However, either due to the inefficiency of its practices or due to the ineffectiveness of its results, it can be seen that territorial management has shown itself unable to anticipate and monitor the mutability of urban systems (forms and functions) induced by actual transformation dynamics. The positivist planning that has lasted has failed, since it is based on policies and instruments managed segmentally and sectorally, where the definition of strategies does not correspond to a prior systematic assessment, as well as the definition of strategies not corresponding to actions undertaken, showing, through the disconnected state of the environment and the functioning urban systems, that it is urgent to have a management system supported by planning based on a prior systematic assessment of the contexts which are the object of management action.

Objectives and organizational structure

The growing complexity of urban systems requires approaches which traditional planning has not provided. To respond to the complexity, uncertainty and risks brought about by globalization and technological progress, studies involving the future, scenarios and strategic planning have been seen by some as a viable alternative, increasingly used as creative and cooperative basis for decision making processes (Bina et al., 2014).

Therefore, the challenge is: how to design and operationalize planning/territorial management instruments and processes capable of regulating and managing the development of urban spaces in a balanced and sustainable manner, despite uncertainties and adversities, i.e. resilient urban development?

Our starting point is the impacts, i.e. in spatial planning (SP) in a case study within a context of stagnation after induced accelerated urban growth, for which there is a need to find responses to the resulting challenge faced there. Starting from theories of self-regulated strategic planning, a search for innovative aspects is carried out through a holistic approach, within the fields of planning for uncertainty, the concepts of integrated strategic management and management performance evaluation, applied to sustainable urban planning, seeking concepts and techniques which constitute a territorial management (TM) model endowed with adaptive planning. The conclusion will summarize the benefits which can follow from the proposals developed.

A case of urban stagnation and diseconomy

Contextualization of the case study

Since it joined the European Union (former EEC), Portugal witnessed a huge boost in its infrastructure and territorial facilities. As regards infrastructure, road links improved the most. The only connection of Lisbon with the south of the country was made using the 25 de Abril Bridge, and this needed to be strengthened along with accessibilities to the Lisbon Universal Exhibition, which was held in 1998. As such, the construction of the Vasco da Gama Bridge from the location of Expo 98 completed the second connection of Lisbon to the southern motorway, crossing the south-east sector of the southern side of the metropolitan area, which was then marginal compared to the central element (Lisbon), only connected by river transport routes and with an urban occupation made up of small-sized consolidated urban agglomerations of a somewhat predictable size.

Given the singular circumstances of that situation and the magnitude of the investment, the initiative to construct the Vasco da Gama Bridge was taken significantly in advance and was highly mediatized. This was a time of urban expansion and increasing mobility through individual transportation. So, as was expected, with this new access to that subregion having been implemented, there was an impulse in the market for land and real estate in the urban centres located close to the first local accesses to this new link between the two banks of the

Tagus estuary. This was therefore, another typical case of urban expansion caused by road infrastructure.

The phenomenon of expansion was expected and even desired, so the local municipalities, when developing the respective municipal master plans (MMP), which determined the classification of land use, envisaged large perimeters of areas to be urbanised. The Government established a capital gains tax on the land and real estate markets, justified by the national investment which had occurred. We then saw that the actual administration implemented policies which, supposedly justifiable by local development and public budgetary sustainability, promoted and even focused on stimulating urban expansionism. However, the process of growth and consolidation was still taking place when the global economic crisis occurred and stagnation of that growth occurred with negative reflexes of a varied order on the environmental, economic and financial conditions of a fragmented and unfinished urban space.

The context described can be seen as one of the main case studies relevant to the support framework analysis for the design of the MT system model that has been developed here. To do this it has been necessary to focus observations on the urban centres of Alcochete, Montijo and Pinhal Novo (Fig. 1) which are the closest agglomerations to the first access points from the IP1-A12 (south side of the Vasco da Gama Bridge) and in which the urban boom caused by the new infrastructure was most notable.

Figure 1 – Location of urban perimeters under analysis



Source: Google Maps

This reflection is based on the analysis and confrontation between municipal management models (instruments and practices) used in different examples of a paradigmatic case study, assessing them and correlating them with the respective effects on spatial management and environmental and economic sustainability. Thus, the relation between the phenomenon of urban growth with different MT practices and the urban action carried out in the urban perimeter of Alcochete, Montijo and Pinhal Novo were observed, seeking to identify the trends, planning, mid-term planning and programming, that formed factors which led to the systemic anomalies which shaped the territory in those economic and financial circumstances.

The trends observed in the case study

Below the evidence identified in the examples analysed will be presented, systematising the trends observed in the MT performance.

Trends in the planning and programming of the urban space: (i) Planning with weak support concerning vision and strategic weighting; (ii) Over sizing of the space to be urbanised, at the expense of rehabilitation and bridging urbanised spaces – disqualification, fragmentation, dispersion; (iii) The widespread absence of detailed plans and other forms of urban programming; (iv) When partial use was made of PP, as happened in one of the examples analysed, there were notable contrasts in the quality coherence between the spaces developed in a distinct manner; (v) Generalised negligence regarding the financial plans in the territorial management instruments (TMI), particularly more demanding in the UP and PP, generally not present when assessing their economic viability; (vi) Poor use of the land to be urbanised, less than 50%, after 15 years following the approval of the MDP; (vii) The urban growth was as large as close to this (equal trend in the slowing of the construction space).

Trends in the effects inherent to the control and management practices for urban implementation: (i) Reduced use of programming and urban conciliation mechanisms; (ii) Reduced use of management methods and urban operation control mechanisms; (iii) Lack of consideration of externalities related to land market trends and urban real estate products; (iv) Indefinitely fragmented urban shape; (v) Structural anomalies in the allocation of facilities and public spaces; (vi) Excess infrastructure, without users, for an indefinite period.

The resulting trends of economic and financial management practices: (i) Absence of preventive assessment of the economic viability of municipal planning in general, urban plans and operations; (ii) Weak or absent linking between the municipal budget/investment and the municipal territorial management plans; (iii) Mismatch between the structure of the municipal accounting (POCAL) and the structure of the territorial/sectoral management system for urban development, making financial/budgetary control and management more difficult; (iv) Chronic budgetary deficit, with a cyclical dynamic co-related to local authority mandates, motivated by systematised budgetary regulation; (v) Difficulties of budget appropriation aimed at the development of the urban space, in competition with other sectors involving municipal activity, in the financial distribution of activity plans and the municipal budget.

The resulting trends for externalities: (i) Stagnation of urbanisation and construction; (ii) Surplus: housing stock vacant, supply of urban lots, expected urban land plots and subsequent

products of urbanised space; (iii) Infrastructure and urbanisation works in general, constructed or under construction, not used or not finished for an indeterminate time; (iv) Structural mismatches in the provision of facilities and functions or services involving collective use – not consolidated in certain urban areas with the facilities built being oversized regarding needs, indefinitely, others without such facilities due to a lack of justification to construct the planned facilities.

Figure 2 – Illustration of trends



Legend: (i) undeveloped infrastructure; (ii) detailed planning but without adaptive regulation; (iii) urban expansion without an urban programme adapted to the demographic growth. (iv) buildings indefinitely uncompleted.
Source: Own elaboration

What went wrong and why - an overview

Given the stated tendencies, let us now draw conclusions from what has failed, trying to identify probable explanations, especially when dealing with tendencies contradictory to the supposed objectives of the SM public policies and the formal TM system. Thus, the following have failed: (i) the SM and environmental sustainability policies, in the management of the urban

space where fragmentation and structural incoherence have been seen, as well as excessive consumption of land and negative environmental impacts, both because the new spaces were not consolidated and because the conservation of the consolidated spaces was neglected, resulting in the subsequent deterioration of the urban structures and the environment as well as a lack of coordination and imbalances in collectively used functions or services; (ii) social policies regarding housing and services to the community since the fragility of urban development control left certain constitutional guarantees vulnerable such as the right to housing since access to this was made difficult or impossible for the population due to high prices and frequently inadequate localisation; health and education since suitable appropriation for the respective facilities *in situ*, with the right capacity and at the right moments, was made more difficult; the right environment and quality of urban life faced with a disconcerting “work site atmosphere” and deterioration of the residential and working spaces; (iii) the economic and financial policies inherent to urban development, thus generating persistent or cyclical situations of both functional and budgetary diseconomy and even that of financial non-sustainability.

The fundamental reasons that we have concluded to be at the basis of these performance failures in the TM system may be summarised as follows: (i) Belief by the regulatory authority that urbanisation can be undertaken through territorial management instruments (TMI) when, in fact, it is mostly undertaken by direct urban operation without prior urban programming; (ii) Reduced use of TMI in detail and in terms of an operating programme, since it is believed that the municipal master plans will be sufficient, without a strategy including a preventive and prospective element and without a programme which considers management techniques and control of the urban growth process; (iii) Despite the TM system establishing and undertaking regular assessment of the state of the territory and the system indicating execution of plans, this has rarely happened. On the other hand, there is a notorious lack of critical assessment regarding the performance of the TM system itself, especially where the complexity of urban systems requires more efficient management, in the cities.

However, based on the same public policies and the same TM system, cases have been observed which show apparently positive results and which have become reference examples, perhaps as a result of best territorial management practices but also counting on the help of favourable circumstances, which demonstrates that the formal system is, indeed, susceptible to personal strategies or attitudes of the actors, that is, it needs to be complemented with a safe guide which reduces the margin of randomness and error in territorial management practices.

The state of spatial planning at the local level

In the tradition of urban management and planning practices, the plans have been limited, in general, to a classification of action and qualification of the urban land, followed by the policy action of use and occupation of land according to urban parameters established in the MDP, not proposing procedures involving systematic programming of urban development as well as controlled and preventive monitoring in the carrying out of this.

On the other hand, although the detailed planning translates into more concrete and objective urban proposals, enabling prior environmental assessment and public participation,

the typical delay and its mandatory format leads to its rejection most of the time, which endows it with an asymmetric or even rare character. It tends to be adopted only to fit in with the construction of a large facility or even a large urban or industrial development, through need to alter the MMP. In this way, planning almost exclusively through the MMP has served mainly to open/classify new areas to be urbanised but not in a way which has been thought out and adjusted to needs, therefore devoid of the progressive phasing of their implementation and remaining dependent on the initiative of their promoters. After having experienced the development and implementation cycle for first-generation MMPs, the reality shows that the MMP is insufficient for territorial and urban management.

Indeed, relating the dynamics and volume of production of urban space through private initiative with the tiny number of municipal urban plans, it can be assumed that urban development is rarely carried out in a coordinated and cohesive manner. Given the lack of the necessary political effort and management planning and proactivity, utilising an integrated vision endowed with a strategy, urban development is confined to the logics and interests of urban agents and land, real estate and financial markets, ending up, sooner or later, with this leading to environmental and functional imbalances and to accentuated systemic financial diseconomies. In fact, it is within this framework that one finds such a state of (lack of) planning and (non) sustainability of the territory. Planning and management of land use cannot be ignored in this structural context, with the risk of questioning its creditability.

The territorial management system and its contradictions

Given the objectives of this approach, I will now summarize the structure of the TM (TMS) system formally established in Portugal regarding municipal intervention, in terms of the territorial management legal system (TMLS). According to the legal framework of the system, we can group the territorial management instruments within the municipal area into three levels, structured in the following manner: (i) At the strategic level: the Municipal Master Plan (MMP), the Urbanisation Plan (UP) and the Territorial Action Programme (TAP), not forgetting the report of the state of spatial planning (RSSP) as an assessment-diagnostic instrument system; (ii) At the level of operative regulation for implementation and for urban programming: the municipal regulation for urbanisation and building (MRUB), the planning and management operative unit (PMOU), the Detailed Plan which can take on various formats, due to its specific or simplified nature, the implementation unit (IU), the urban regeneration programme (URP), etc.; (iii) At the level of implementation: the subdivision operation (SO) and the urban operations (UO) of allotment, urbanisation and building.

For the objective in question, in accordance with Grave (2009) and based on empirical recognition from *praxis*, we will list some contradictions found between what the legal system establishes for the plans and what in fact happened in practice planning and implementation:

- The TMS establishes that municipal plans must comply with a strategic reference framework and the supramunicipal instruments (PNPOT, PROT, etc.) define strategic or regulatory guidelines that should be included in the municipal plans, but they are not, indefinitely, in conformity with that referenced and poorly define a vision and

development strategy with concrete and well-formulated objectives, nor goals and indicators regarding implementation;

- The TMS lays down that municipal plans should form part of the financial and implementation programme, but the actual TMLS classifies these as elements accompanying the plan, as if they do not form an intrinsic part of the latter, thus ending up having a pro forma nature and so becoming undervalued by agents when drawing these up (promoting body, technical team, monitoring committee) and, furthermore, in their use (land authorities, management team) when implementing the plan;
- The TMS is based on the TMI but urban growth prevails through asymmetric urban operations, even with a large scale and impact, not subject to prior detailed planning or programming, thus making processes quicker and less complicated, which is facilitated by the (lack of) connection between the TMLS and the EULS, making a rule of what should be an exception;
- The TMS provides for the establishment of implementation units as an implementation mechanism for programmed urbanisation but do not concretely and objectively specify their programming requirements and the documental organisation of that instrument, merely laying down that the IU may or should be listed within the UOPG, detailed plan (DP) or in any place, leading to this important instrument not being used;
- The TMS provides for a typology of grounds for refusing intended urban operations but its explanation is reproduced in the plans and ongoing management made based on the vague, non-specific typology contained in the EULS;
- The TMS determines the application of systems involving indicators and the monitoring of the state of the territory (RSSP, network observations, etc.), essential for a more preventive and timely planning, but it is mainly absent and there is no registration and public dissemination of that instrument.

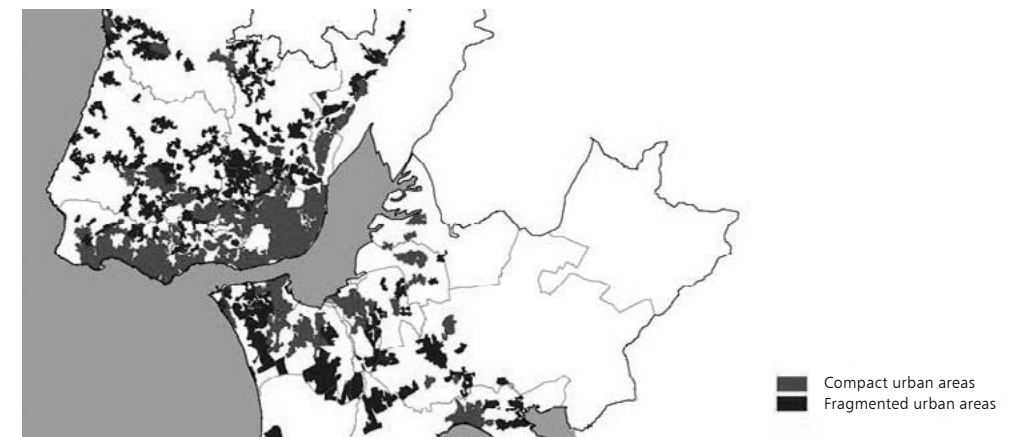
However, the difficulties of territorial planning are felt internationally, even in countries with extensive experience and a sense of innovation in this area. A systematised assessment concerning local territorial planning practices in the United Kingdom (Department for Communities and Local Government, *Spatial Plans in Practice: Supporting the reform of local planning – Final Report*, London, 2008), confirmed this idea and from this some of its conclusions have been extracted and translated into the following necessities: (i) More plans as instruments to manage change but with a long-term strategic approach; (ii) Plans drawn up and managed based on assessment proven by data and evidence; (iii) Plans drawn up in partnership with and including the greater involvement of stakeholders from the various sectors in the same territorial area; (iv) Suitability recruitment and professional training providing planning professionals with new competences (data, analysis, creativity and facilitation, project management, implementation and assessment); (v) Responsibility for drawing up territorial plans should be attributed to multidisciplinary teams placed in a central position within the local authority and not within one department.

On the need for adaptive territorial management

(Un)regulated urban growth, its (dis)equilibria and (dis)economies

The model of the Fordist industrial city, marked by a compact and solid structure, was reconfigured with the coming of the tertiary sector of the economy, the generalisation of the road infrastructure and the increased degree of motorisation, with two types of urban occupation coexisting, namely one supported by public transportation, favouring a concentration along the routes served and their immediate surroundings, fostering high densities and multi-family typologies; another based on the motor car, encouraging a distended and fragmented occupation, marked by deficient linking of the urban fabric which was not very well structured, with multiple uses and varied typologies. The city limits gradually extended and took on ever more imprecise contours. These dynamics affected the compact consolidated city, the population, employment and functions which went down and also physically deteriorated. Extensive urban occupation demands resources and mobility, while stimulating “urban waste” (early withdrawal from urban fabrics with facilities, and multiplication of new infrastructures which remain indefinitely underused (Pereira, 2009). For that reason, this is challenged in the light of the principles of sustainability.

Figure 3 – Urban occupation in AML



Source: PROT AML, change Proposal 2010

Considering the Lisbon Metropolitan area (LMA) as a paradigmatic example, the 2011 Census showed the continuation of previous trends in the reduction in the number of residents in the city centre and growth in the municipalities of the periphery, along with average ageing in Lisbon and average rejuvenation in the periphery. These trends have occurred for around two decades, as a result of a combination of factors of a varied nature, both in economic and financial terms as well as sociological, but where governance action plays its part. The city of Lisbon has had differentiated growth dynamics within it. The city expanded its administrative limits despite

not expecting more than just maintaining its 2001 demographic level. The bordering crown and related axes *to the north and west of Lisbon* along with the *southern river arch* were the parts of the metropolitan area of Lisbon, from one side and the other of the Tagus estuary, which showed themselves as the cause and effect of the main phenomenon of demographic mobility, which took place within the central nucleus of the metropolitan region.

The accelerated urban growth had, and will have until it attains its utopian consolidation, characteristics of fragmentation and disconnection, congestion in terms of mobility, asymmetries in the allocation and quality of public services and environmental conflicts. It was the crown areas which witnessed the largest population growth in the LMA. On the other hand, the highways formed the determining factor in terms of the available localisation options and, as a result, induced the spatial orientation of urban growth. In Figure 3 it is easy to co-relate the urban growth axes with the major transport infrastructures. The market for the supply of urban products unveiled opportunities brought about by public investments in accessibilities and transport and promoted an offer which ensured a strong appetite for demand.

Along with the public investment in accessibilities, urban promoters played their parts in local accessibilities. However, these promotional initiatives have been random and disconnected within time and space. Hence it is the case that, despite certain efforts at coordination undertaken by each municipality, they are far from achieving full cohesion and, at the intermunicipal level, the disconnection is striking. The actual carrying capacity of the infrastructure and urban service networks, from the accessibilities and public transport to the supply and sanitation networks, inherent to the first stages of growth, was overloaded with the subsequent urban and demographic growths, which was reflected in the increasing congestion, potential breakages or the quantitative and qualitative insufficiency of services. As for networks of amenities and social spaces with a collective use, the investment and construction of which, as a rule, did not come down to the urban promoters, the situation would show itself to be more dramatic and have devastating economic and financial effects.

This phenomenon of tending towards non-sustainability is contrary to social and urban cohesion where, as is natural and expectable, certain areas of the city, due to localised dynamics, have regenerated or even increased their level of quality, generating, in contrast, phenomena of urban segregation. This tends to produce a city made up of an archipelago of urban areas of quality, surrounded by deteriorating or run-down urban areas. As a result of these dynamics from contradictory effects, opposing the trend towards consolidation in the recent city towards the trend regarding the deterioration in the consolidated city, the installation of a scenario of duplication of costs can be seen: the first represents the investment effort in its consolidation of the urban system which is still incomplete; the second represents the investment effort in the recuperation and regeneration of the consolidated urban fabric which has entered into a process of decline. It is easy to conclude that a city, seen as an extended shape, functions as a system of communicating vessels, in which, when load is borne or dynamics are installed in certain parts, the others will react in a contrary sense, since, in an urban system, effects are not uniformly distributed, as they depend on sectors and the governance factor.

The economic and financial issue

The systems referred to raise a fundamental economic and financial question with territorial impact both from the view of private initiative as well as public initiative. However, it is important here to highlight the perspective of public initiative at the municipal level, since it is the municipal management of the territory that is being discussed here.

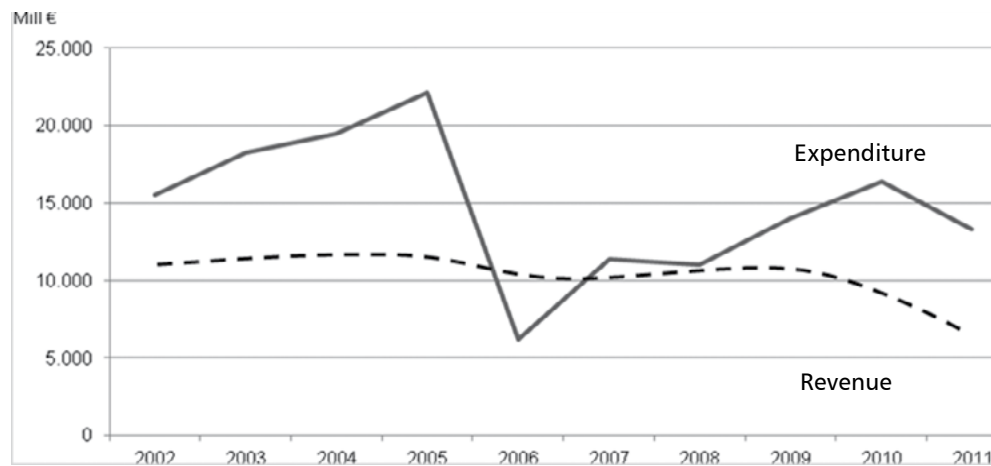
The municipal management of the territory and the land market are driving and conditioning factors for the development and the quality of the urban space (Grave, 2000). The urban TM is played out, from the beginning, in the land market. Various authors recognise that the land and speculation related to its value are the main drivers of economic and financial crises. What is certain is that "land prices have been ignored by the economists (...) the fact that the land remains an obscure and insignificant layer in economic theories leads to these not having the capacity to predict depressions caused by real estate bubbles" (Gaffney, 2009: 8), quoted by Henriques (2015: 20).

In fact, the issue of territorial management and dynamics, and in particular the urban economy, has been brushed off in academic discussion and even in TM praxis. This is due to many reasons, with the most direct having to do with the absence or opacity of information (data) which can enable its structured analysis and deeper reasons having to do with the strategies of the intervening agents and regulators since budgetary constraints restrict the freedom of action of the actors in accordance with the interests driving them, which is in full conformity with the neoliberal order of which we form part. However, the context of the current crisis, which stems from a philosophy of tendential economic deregulation and belief in a permanent growth dynamics, has led to the emergence of the principle of economic sustainability.

Despite the scarce information made available, through the possible collection of territorial impact data resulting from municipal budget implementation reports within the LMA, the chart in Fig. 4 was drawn up which represents the evolution of expenditure and net income for territorial impact, in average terms, with the necessary adaptations regarding the way the accounts are structured in line with the Official Plan for Local Administration Accounting (POCAL). In the chart, taking into consideration practices recognised in the area of municipal budgetary management, there is evidence of public knowledge, such as the growing and chronic indebtedness of the municipalities, the recurrent and notorious gap between estimation of revenue and expenses and between the budget and its implementation as well as the recognised absence of integration of investments inherent to the territorial plan proposals in the municipal budget.

Looking at the average budget evolution for territorial impact, sampling considered based on data collected regarding the Lisbon Metropolitan Area, between 2002 and 2011, the following trends or signs can be observed: (i) evolution of the expenditure amount over time, predominantly higher than income, resulting in a chronic budgetary deficit; (ii) evolution of a tendency towards growth, with a drastic reduction in 2006, which is repeated in a less accentuated manner in 2011, signalling an attempted budgetary rebalancing; (iii) the years in which that reduction is observed correspond to the start of political mandates.

Figure 4 – Graphic average budget trend territorial impact to the LMR 2002-2011



Source: compilation by the author

Among the reasons which are recognised as facilitating these tendencies or cycles are: (i) the systematic lack of preventive assessment of economic viability of municipal investments in general and investments earmarked for plans in particular; (ii) the lack of the application of management and control methodologies which ensure a balanced economic and financial performance, particularly a prospective approach for planning activities and budget which takes into account quality information which is sufficiently certain and where the link between planning and territorial impact has to exist; (iii) in order to implement the conditions described above the municipal accounting structure (POCAL) has to be linked and made suitable to the TM sector structures.

Spatial management public policies

This framework of concerns has stimulated the search for alternative urban models which are less predatory on resources (land, energy, landscape, agricultural and forest areas of biodiversity), supported by a more sustainable mobility. The first proposals arose in the USA with the New Urbanism (1980s) and later with the Smart Growth and Low Carbon Cities. In Europe, initiatives have proliferated, associated with Urban Renaissance. In the United Kingdom, a working group set up by the government (Urban Task Force) produced a reference document (Rogers, 1999); in the European Union there have been successive guiding documents - Green Book of the Urban Environment (1990); Aalborg Charter (1994); the Aalborg Commitments (2004), Leipzig Charter (2007), Toledo Declaration (2010), and Cities of Tomorrow (2011). The guidelines recommend urban models based on contention at the expense of expansion, in revaluing the concept of proximity, in multifunctionality and sustainable mobility.

The Framework Law for Spatial and Urban Planning (LBPOTU) defines principles and objectives in defence of the new urban paradigm. In the same vein, the National Programme

for Spatial Planning Policy identifies unplanned urban expansion as one of the problems of spatial planning. In addition, the Regional Plans for Spatial Planning in force take up the fight against urban fragmentation and dispersal, through guidance regarding the applicable norms for municipal plans relating to spatial planning, and, in particular, restricting expansion to needs resulting from economic and social dynamics in ensuring their programming, and promoting the reversal of urban perimeters when justified, and restricting building in rural areas. In fact, the LBOTDU lays down that it is up to the municipalities "to carry out coordinated and programmed implementation of their territorial planning instruments". This envisages a set of instruments to operationalize plans (Cunha, 2012: 283). However, use of programming tools is not the case. We are led to conclude that the LBOTU and the TMLS end up having a reduced effect at the municipal level. These regimes were subject to a recent reformulation which emphasised the imperative and restrictive nature of those guidelines but, on the date of publication they had been recently approved or were in the final stages of drawing up most of the MMPs. As a backwash, most of those plans will remain in force until their future revision (10-year period), with the extensive underlying spatial models remaining valid.

It is necessary to discuss the validity of the processes as well as the planning and management instruments in force. It is no longer possible to plan for unrealistic population growth, arguing for oversized urban perimeters, delegating the urbanisation initiative to the holders of the land, and keeping local administration with the passive role of regulatory verification. Given the existing situation, urban development must be guided by three principles: restructuring and improvement of the fragmented city, regeneration and revitalisation of the consolidated city and contention of the emerging city, in line with the sustainability of the urban conjuncture as a whole. But how can this be done?

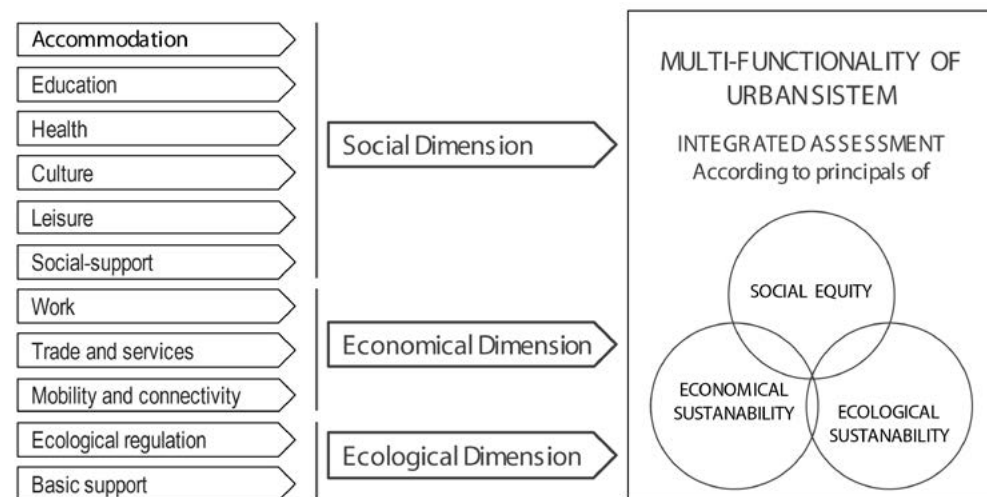
The management of the complexity of the urban space - which needs

Urban multifunctionality

The city has numerous plans, availability of resources, social and cultural flair, comfort and security, the exchange of goods and services, etc. In the meantime, it has been structured and has become specialised according to living, work, leisure and sociocultural representation. It is spatially segmented and socially stratified. Specialisation has become second nature to urban individuals, a trend that has not stopped growing. As Rossi (1982) mentions, the confirmation of the city is the result of two major systems: that of the city as the product of functional systems creating its architecture and the city as a spatial structure. Guiomar et al. (2007) states the following essential characteristics of the urban phenomenon: morphological – the form of the urban centre; functional – the functions inherent to the urban elements; structural – those relating to the support structure of urban systems. Each part or element does not exist alone but within the global system. Therefore, these elements should not be thought of and managed individually. In short, the urban space is intended to provide, within a structured, efficient and sustainable form, the environmental, social and economic conditions of comfort for its citizens.

Urban multifunctionality consists of a set of functions housing different functional attributes of the community. Urban functions must be carried out in a harmonized manner and with a view to the balanced and lasting satisfaction of ecological functions and the needs of urban users. They should be organised and structured spatially and functionally as a function of the hierarchisation of the urban system, suitably multicentred and hierarchised. The European Commission (1996) recommends the Principle of urban management - urban management for sustainability is a political process requiring planning and which has an impact on urban management. The process of sustainable urban management requires a series of instruments targeted towards ecological, social and economic aspects seeking to provide the necessary base for their integration. Given this, the TM of complex urban systems should be configured as a function of the sizes in which the fundamental attributes of the urban space are structured. According to Grave and Vale (2014), urban multifunctionality may be summarised according to its social, economic and ecological dimensions, involving the following attributes: (i) Social dimension – shelter, education, health, culture, leisure, social support; (ii) Economic dimension – work, trade and services, mobility and connectivity; (iii) Ecological dimension – regulation, support (Figure 5). The variables of each attribute of the urban system are determined through the elements (spaces and functional systems) which embody the respective functionalities of qualities considered most determinant for the satisfaction of the needs and social aspirations and ecological contingencies and, therefore, those which are critical for the verification of the respective performance in the systematic strategic assessment procedure.

Figure 5 – Diagram of the multi-functionality and integrated assessment of sustainable urban system



Source: Prepared by the author

The globalization of the economy has strengthened the role of cities in the new knowledge economy and creative economy, implying changes in urban governance and changing develop-

ment priorities, not always compatible with the priorities of social and territorial cohesion (Vale, 2007). In this context, there have been many recommendations and policy directives for sustainable development as a support for human activities: The Leipzig Charter mentions that "We strongly support the EU's Sustainable Development Strategy, (...), with the objective of protecting, strengthening and further developing our cities. In doing so, all dimensions of sustainable development should be taken into account at the same time and with the same weight. These include economic prosperity, social balance and a healthy environment. (...) In the long run, cities cannot fulfil their function as engines of social progress and economic growth (...) unless we succeed in maintaining social balance within and among them, ensuring their cultural diversity and establishing high quality in the fields of urban design, architecture and environment."

Strategic governance

An urban space is created in five phases: land classification and qualification, availability of land on the market, land restructuring, creation of infrastructure, and building. In the absence of control, this would probably take on another order. This progression in creating urban areas is determinant for the coherence of the urban fabric, although the Administration tends to open/classify new urban areas without considering needs, not interfering through the programming of its gradual implementation and being dependent on the initiatives of the promoters.

For effective control of urban development, it is not enough to establish the use of the land nor the mechanism for the programming of urban land, always susceptible to degeneration from random external pressure factors. To set the direction of urban growth and prevent the aforementioned randomness, they can play a strategic role in setting up the infrastructure and the tactical location of public investments (Henriques, 1990). Other authors follow this logic of action, such as Pardo et al. (2000), mentioning an active land policy beyond mere urbanisation and supply of constructed spaces depending on the options of promoters and also that the land to be urbanised should be established in coordination with the creation of infrastructures for general services and transport networks defined by the administrative authorities, through concerted actions of urbanism and infrastructures, urban regeneration and environmental infrastructures. It is up to the municipalities, as operative managing authorities for urban development, to take on municipal planning and drive its mediation with socio-economic agents.

Having defined the strategy, the instruments have to be created which, firstly, conceive the structure and urban form with the objectives in mind and, secondly, contain the operative mechanisms that will construct the *physical system* and gradually and effectively reach those objectives. These mechanisms translate into programming tools (the tactical action), which prevent potential randomness or interests contrary to the publicly defined strategy. Therefore, so that the territorial development takes place within sustainable parameters, both from the overall ecological viewpoint and urban ecology, it is necessary to ensure a controlled urban development where, while preserving freedom and individual interests, collective interests in terms of patrimony, the environment and integration and social coexistence can be ensured. An organizational system for coherent urban development has to be established, supported by a global strategy for the territory which brings together local interests and wishes with the supramunicipal framework.

Thus, in the local TM process, measures should be taken in the following stages of operation:

In the strategic plan: (i) Ensure a dynamic of local development, favouring global management of the urban space preventing cost redundancy, through governance which is both strategic and operational; (ii) Implement variable urban management regulation for different territorial areas based on circumstances.

In the regulation plan for agent practices: (i) urban development through prior assessment of needs, of the management of a land grant for urbanisation and careful planning of the general infrastructure networks and collective amenities; (ii) Impose the principle that urban plans and projects should show their economic viability and ensure the programming of their implementation and funding.

In the sectoral and detailed planning, programming and project implementation: (i) Focus on the urban projects, plans and sectoral programmes, managed in connection with the annual activity plan and municipal budget; (ii) Allocate urban programming subject to the provision of land to be urbanised to the joint assessment of needs and availability in the consolidated city.

In the management, negotiation and contracting plan: (i) The urbanisation initiative should bring together contracted synergies between the various socio-economic agents and the administrative authority; (ii) The administrative authority assumes proactive leadership through a firm urbanisation programme based on negotiation and contracting with the agents.

In monitoring the state of the territory and the governance performance level: (i) Develop monitoring systems for the state of the territory and the degree of implementation of the TMI, for permanent surveillance of the territorial and socio-economic dynamics; (ii) The system of indicators should be structured along three axes + one: environmental, social, economic and governance.

Proposals for an adaptive territorial management model

Theoretical assumptions

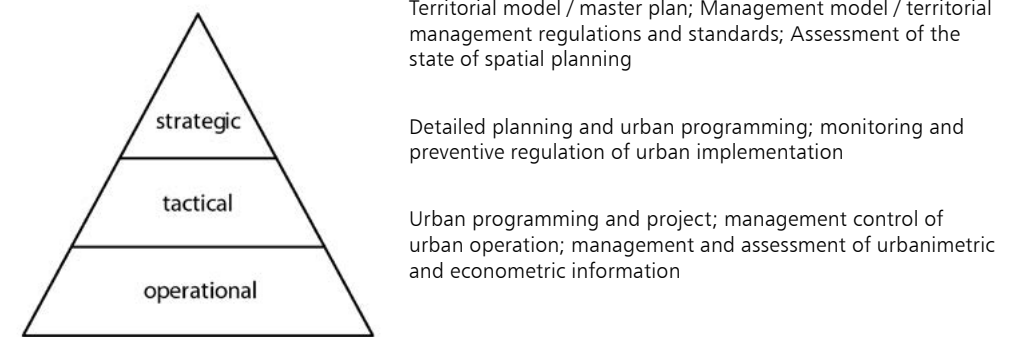
Urban multifunctionality is based on a relationship of mutual cause and effect between its topo-morphological structure and the nature of the services to be provided. Efficiency and accuracy of management in territorial governance is essential for all of this. Demographic concentration requires the planning and implementation of public policies to ensure quality of life and environmental conservation, otherwise urban chaos and a deseconomy of resources will occur. The sophistication of structure and territorial development led to the need to carry out *planning*, through the act of designing and programming actions within time and space with physical effects with functional and sustainable performance with a framework of

interdependences in which it is intended to think today about the reality of tomorrow and which forms an ongoing and interactive process with an ensuing dynamic character. However, as was made clear above, the act of designing a territorial model and programming the actions to build it, does not in itself ensure it is consistent with the dynamics, uncertainties and surprises, and also the territorial impact, which may occur in cities.

Several methodological approaches should be put in place. It is assumed that positivist planning is outdated because, as Pardal et al. (2000) mention, planning is not knowledge or foresight of a phenomenon but a component that forms part of the phenomenon. Some argue that prospective planning is no longer valid today due to accelerated dynamics and paradigm changes and one should adopt a planning by opportunity (Just-in-Time) towards tendencies. In contrast to that approach, we use the push/Fordist approach regarding planning and management (Just-in-Case) in which it is long-term planning that plays an active role in the process. While JIT is based on a more horizontal hierarchy which consists of a strong initiative, cooperation and interaction between the agents, teamwork and multifunctionality, JIC focuses on a rigid, vertical hierarchical structure which requires the specialisation and functional segregation of the controlled agents, provoking competition between them (Alfasi & Portugali, 2004).

As for the vision to be developed, the future is not written but is to be undertaken, as Godet (1996) would say. Therefore, as it is not possible to predict the future, given the uncertainty and exactitude of this, it is necessary to anticipate the dynamics of the tendencies (scenarios) and describe what is desirable. What is therefore proposed is an exercise in foresight where the future is not seen as extension of the past, since it is subject to contingencies and wills, but to visualise multiple possible indeterminate futures given the level of freedom of human action. On the other hand, planning or management of urban systems has to be carried out on different spatial and temporal scales, and at different levels of activity (Fig. 6), both in the design of the future desired and in the definition of the actual means to get there i.e. it provides a strategy, a set of behavioural rules, to enable us to reach the policy objectives. Thus, the strategic planning (development vision plan) establishes the objectives that compromise the long-term while operational planning seeks to select and apply, in the short term, the means necessary to attain these objectives (action plan).

Figure 6 – Hierarchicalisation of planning



Source: Adapted from Ferreira (2005)

However, the strategic planning methodologies of cities have already gone “from the descriptive approach to action/decision” (Ferreira, 2005), in the interpretive and critical perspective and has gone from a rationalist vision to a collaborative approach (Pereira, 2009). If the product results from a creation process, the qualities of that product are a reflection of the good dynamics and the good options taken throughout this process i.e., information, method, instruments, determination and accuracy in complying with the strategy that does not reject innovation and opportunities. This is a principle which also arises when dealing with the creation of the urban space and which will have to result from a process regulated by coordinated and attentive management of both internal as well as external factors. These factors are linked and interact according to a dynamic hypercomplexity where mediation, assessment and regulation instruments have been little or not at all utilised in the area of urbanism. That is to say, given that new reality, there must be an interactive planning for this dynamic reality, with a self-adaptable ability or self-reactive to the contextual dynamics at each moment, i.e., planning with strategic management interacting with contextual and external dynamics.

On the other hand, the City, in a meeting its plans, is constituted as a territory or system which develops supply and demand dynamics according to market logics. As such, the construction and development of the spatial or physical structures of that system needs to be managed as a complex undertaking, using pure business management techniques which have to be guided by a vision of the overall market involving and assuring conditions of efficiency, resilience, sustainability and competitiveness. However, with the fundamental distinction, that while business management involves material gain – financial as its fundamental objective, urban territorial management has the fundamental aim of satisfying the interests of society.

In summary, a *planning process constantly regulated, upstream, by a strategic reference framework, guided towards development objectives and implementation targets resilient to (social, economic and ecological) dynamics of the context and to externalities, through preventive and structured monitoring.*

Innovating mechanisms for systematically cohesive and adaptive management

This imposes the need to reform positivist planning, introducing urban TM instruments and mechanisms with new instrumental ranges, which are economically and financially important, and with properties to adapt to the trends verified at each moment and opportunity. In this sense we can systematize certain proposals, structured as instruments, according to the planning levels:

At the level of strategic planning - defining a vision and development objectives sustained by a previous assessment of the state of the territory and the potential interaction of this with tendencies from the external surroundings, which enable the consideration of development scenarios, both desirable and undesirable, to set up the guide for objectives and goals through which the operative interim planning is designed and conceived.

At the level of interim planning – linking of plans and management within an iterative and dynamic process, having as a reference *strategic planning* but being weighted by preventive assessment mechanisms for goals and externalities, which caution budgetary implementation, seeking concerted solutions, involving all actors and stakeholders.

At the level of operational management – implementation of a panoply of operationalisation mechanisms for auxiliary management for preventive assessment, for information for the agents, bringing interests together and implementing urban projects, promoting quality and environmental, social and economic sustainability.

Territorial management through prospective and integrated assessment

Integrated prospective

Planning consists of assessing the present and projecting a desired future but, as it is not possible to predict the future, and given the uncertainty of the exactitude of this, one can and should anticipate the dynamics of trends and describe what is desirable (setting scenarios). What is therefore proposed is an exercise in foresight where the future is not seen as an extension of the past, since it is subject to contingencies and wills, but which visualises multiple possible indeterminate futures given the level of freedom of human action. An integrated planning is adopted to attain this prospective, which conceives a desired future at the same time as defining the actual means to get there, that is, it consists of: equipping ourselves, in the long term, with a strategic vision, a set of objectives sectorally set out (development vision plan); At the same time, interim planning is carried out which conceives of the rules of action and behaviour, in the short to medium term, which will enable the obtaining of the policy objectives previously defined but ensuring the maintenance of the necessary balances for the sustainability of the systems (tactical plan); At a third level, operational planning is carried out which, in the short term, seeks to select and apply the resources necessary to reach these objectives (action plan).

Currently, growing uncertainty brings new risks of failure for positivist strategic planning and a future lack of preparedness to face externalities driven by undesirable events or tendencies. Thus, (prospective) planning for the future but (preventively) weighted by ongoing assessment is crucial to sectors such as urban infrastructure networks (transport, energy, etc.), the evolution of which is strongly dependent on the short and medium term. Achieving urban sustainability will largely depend on how we manage the complexity and uncertainty of the interactions between natural systems and human systems. It is necessary to apply the exercise of Urban Prospective, through constructing scenarios - foresight is a way of structured thinking which makes it possible to project the future, control it, and (often) create it (Rogut and Piasecki, 2011), but it is also necessary to apply the exercise of Future studies which is a new discipline seeking to discover or invent, examine, assess and propose possible, probable and preferable futures (Ratcliffe and Krawczyk, 2011), both cited by Bina et al. (2014).

Integrated assessment

Support for preventive foresight is therefore systematic assessment. Featuring a set of the essential functional attributes of the multifunctionality of the urban system and its respective variables, as referred to in point 3.5.1, the integrated assessment of performance is carried out from the perspective of the effects on the recipients in terms of harmony and social cohesion and the level of effort and fair sharing of economic burdens. If this is carried out in a segmented manner it is shown to be inefficient because the simple assessment of the attributes is fragmented and does not bring together the interdependencies and effects from the perspective of the sustainability of the dynamic equilibria of the system. This assessment is therefore cross-sectional, carried out according to three principles ("filters"): *social equity* seeking to ensure the objectives of harmony and social coherence; *economic sustainability* seeking to ensure the objectives and policies concerning supply and demand dynamics of the territorial base; *ecological sustainability* seeking to ensure the imperatives concerning regulating critical interdependencies between the elements of the system and between these and the recipients, as an urban ecosystem. And so the interaction between prospective and assessment leads to regulation.

To reach an assertive assessment, a system of indicators oriented towards local strategic assessment must be set up but which is also interoperable with systems of indicators at a higher level, at a regional, national, European level, specifically the list of indicators proposed by ESPON (2011) for the purposes of assessment regarding European policies for territorial cohesion. These are based on five main axes: [1] intelligent growth in a competitive and polycentric Europe; [2] Balanced development and equal access to services; [3] Conditions of local development and geographical characteristics; [4] Environmental dimension and sustainable development; [5] Governance, coordination of policies and territorial impacts. In addition, the systems of indicators, besides converging with policy-guidelines in force, should add critical indicators for future-implementation, i.e. those which signal (alert) that, from a given moment there is an element with a trend which could potentially or probably create a risk of instability within the system and identify the sectoral areas and the TMI where adaptation regulation measures are to be taken (Fig. 7).

Complexity

The effective management of the territory and urbanism is the main factor ensuring quality of the urban space. For that reason, the planning process has to be guided by targets, the implementation of which is monitored based on a structural analysis. However, the management of urban systems is an area of hypercomplexity in which the factors and interdependences of the problems are exponential, thus requiring instruments that facilitate a coordinated management of the territory and urban systems in an integrated manner. Besides being an integrating element, the planning and territorial management process should be guided by implementation goals and regular reassessment, given the dynamics which will have occurred in the meantime, and the state of the situation and the actual previously established objectives. Therefore, this requires integrated management endowed with prospective planning based on

systematic assessment which promotes adaptive spatial planning regarding the dynamics of this multifunctional complexity, since, as already stated by Ferrão (2011), the emergence of new social, economic and environmental dynamics requires innovative solutions regarding public action coordinating actors and linking policies.

According to Bertalanffy (1975), the system or "organised complexity" may be defined as being a set of elements experiencing "strong interactions" and the general theory of systems has the aim of studying the elements which make up a system, as well as the interaction between them. Indeed, the study of each one independently does not lead to an exact conclusion regarding the system of which these elements form part. This definition encompasses a variety of realities such as an environmental system (i.e. ecosystem, urban system) or an organizational system (i.e. administration, management).

The complexity of territorial systems, due to the multiplicity of sectoral areas, the diversity of actors' strategies and numerous imponderable factors or externalities, requires the sophistication of the means of governance and reinforcing planning processes and operative management. This complexity and magnitude results in the need to think and act promptly at different levels, from the more strategic to the more operational, and at different levels of action, from the design or programming of actions until their execution, and also adding the need to register the results of the monitoring and assessment actions. "The Theory of Complexity shows that even if unpredictable, there is an order or intrinsic organization within apparently chaotic behaviour..." (Lamb, 2006, p.16), quoted by Queirós (2009) which refers, also, to these notions having been reviewed and tested, in planning processes in Portugal, the conclusions for which, furthermore, complement the idea that to obtain efficacy in these processes it is necessary to integrate factors coordinating synergy and leadership which lead to new states of maturity or balance, generating consensuses and bringing together the actions of autonomous actors, making use of tools such as collaborative platforms and information systems and territorial management support.

In accordance with the theories of strategic planning, this should be processed at three fundamental levels, namely the strategic, the tactical and the operative; (i) The strategic level, on a larger scale, has the purpose of defining the territorial model and the desired development vision; (ii) The tactical level, at an intermediate level, has the aim of defining the urban structure model translated into the various sectoral subsystems of the urban system; (iii) Finally, the operative level has the purpose of designing solutions and defining the methods and mechanisms for actual implementation and, I would emphasise, the registration of information (quantitative and qualitative data) concerning both the implementation and the state of conservation of the environment and the dynamic inter-relations between the elements of the physical system and between those elements and the social system. It is therefore the case that strategic management is processed at different levels but, however, there has to be a logic of vertical connection between levels of planning, which, in our understanding, is divided into three procedural levels of operation, i.e. planning and management: (i) That of the definition of the vision and objectives, from the more general to the more specific; (ii) That of the definition of models, methodologies and mechanisms dealing with action and material implementation, from the management model to the strategic level to mechanisms and criteria for urban implementation; (iii) Finally the assessment procedure, to diagnose the state of the situation and recommend the revision and reformulation of the plan, management and action.

Figure 7 – Exemplification of the integrated assessment, structure of economical sustainability indicators and its rational descriptors

	ATTRIBUTES	VARIABLES						INDICATORS OF ECONOMICAL SUSTAINABILITY - descriptor rational	Desired Trend	MANAGEMENT INSTRUMENTS
		A	B	C	D	E	F			
SOCIAL DIMENSION	Accommodation	1	X	X				Average cost of maintenance / management of the urban environment per unit of land use	↘	b) Housing Local Plan
	Education	2	X	X				Collective costs for the conservation / management of schools at: EB1; etc.; Special; etc.	↘	b) Education Charter
	Health	3	X	X				Collective costs for the conservation / management of equipments of health: municipal; regional	↘	b) Health Charter
	Culture	4	X	X				Collective costs for the conservation / management of cultural service spaces level: local; municipal	↘	b) Cultural Charter
	Leisure	5	X	X	X			Collective costs for the conservation / management of leisure facilities	↘	b) Social Spaces Charter
	Social Support	6	X	X	X			Collective costs for the conservation / management of spaces of social support	↘	b) Social-support Charter
ECONOMIC DIMENSION	Work	7	X	X	X	X		Collective costs for the conservation / management of collective space inherent business activities	↘	c) Besness Spaces Charter
	Trade & Services	8	X	X				Ratio popul./establishments: Local trade; shopping centers; public administration; banks; etc.	↗	d) Besness Spaces Charter
	Mobility	9		X	X	X	X	Ratio of various modes of transport/resident population	↗	e) Urban Mobility Plan
ECOLOG DIMENS	Ecolog. Regulat.	10	X					Collective costs in victims environmental risks	↘	b) Munic. Emergency Plan
	Basic Support	11		X	X	X	X	Collective costs for conservation / management of infrastructure networks on high	↘	b) Munic. Infrastruct. Plan

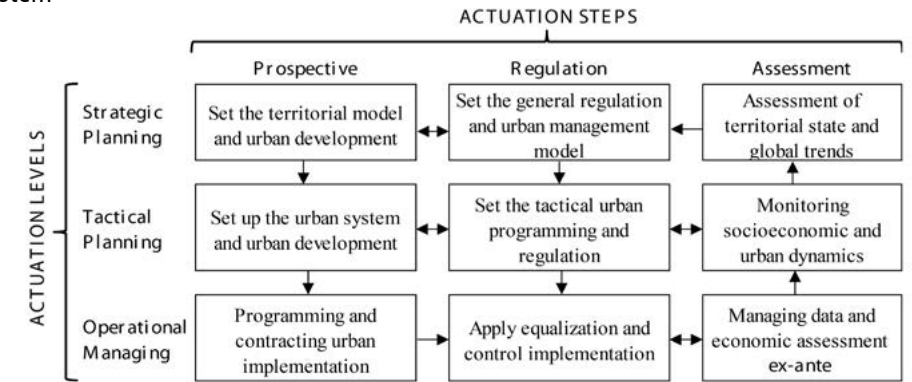
Source: Grave & Vale 2014

How to ensure the efficiency and effectiveness of the management of complex urban systems

The TM system is hierarchical, organising itself through coordinated interaction at national, regional and municipal levels. This institutional structure implies coordination between the various territorial levels and the respective instruments, at the level of sectors and intervening bodies. The organisation of the SM is pyramidal, applicable at the institutional and spatial scale, with this also being the case with regard to the competences and functions of management, from the strategic level (assessment of the context, balancing of the scenarios, vision options) to the operative implementation (contracting and carrying out short-term implementation), to the interim level (formal consideration of the physical systems, legal regulation, programming its implementation, systematic monitoring). In addition, at each level of action mentioned, there are different areas of operation, from establishing objectives (global strategic vision, local or sectoral strategies, specific objectives) to pertinent actions for assessment procedures, to procedures for defining methodologies and solutions for implementation (regulation, programming and project) (Grave, 2013). The first aspect, essential for the TM system which we are carrying out, concerns its functions, that is, that which it serves in general, as a whole, and that which it serves in each of the nuclear elements. To respond to the stated theoretical foundations, and in accordance with that described above, we will now define the Core Functions of the integrated

system for strategic territorial management (ISSTM), through the matrix of Core Functions of the territorial management system (Fig. 8).

Figure 8 – Matrix of the core functions of the integrated strategic land management system



Source: Drawn up by the author

Carrying out the TM functions is undertaken by system elements, the status and form of which are adapted to each management level and area: (i) the instruments (mechanisms and processes); (ii) the agents (public, central and local administration, socio-economic agents, local community and urban implementation promoters); (iii) important resources in the TM (human resources, information, facilitating tools). Finally, to briefly describe the system, its inter-relationships should be mentioned, that is, the connections and dynamic interdependencies between the nodes or functional cores of the system (Fig. 8): (i) core inter-relationships at the level of operation; (ii) core inter-relationships at the area of operation; (iii) interdependencies regarding the external surroundings. Through this structure we can construct the consultation and action guide adapted to the environment of the TM for each actor and each strategic reference framework to be observed in each context. Furthermore, with this structure shaped as such and utilising an assessment methodology using balanced-scorecard indicators, mentioned in point 4.6, performance assessment can be carried out both for efficacy, through verifying the state of the territory, and the efficiency of the SIGTE, through verifying the application index of the management instrumental framework and the level of implementation of the programmed goals.

How to ensure adaptive territorial management

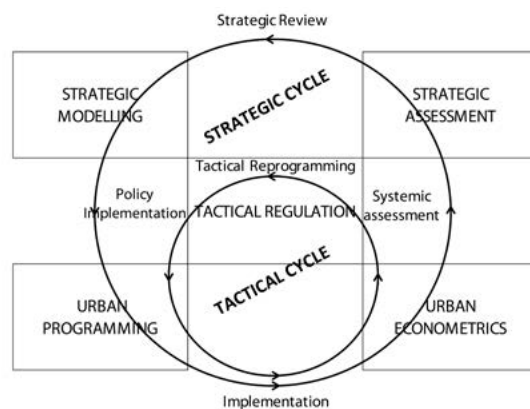
According to Carvalho & Gonçalves (2014), since positivist planning does not include uncertainty or risk, it provides a limited vision of the future in not considering speculative yet possible scenarios, making it inappropriate and structurally incapable of considering the future. Indeed, outlining the future territorial model is not enough, even if it provides the necessary implementation and funding programming, because throughout the development process

externalities occur driven by events or tendencies stemming from the surroundings which in some way influence the supply and demand market for urban products, whether these be real estate or individual or collective services. There was therefore a need to ensure that the planning includes consideration of uncertain but possible scenarios as well as establishing routines which ensure predetermined ongoing assessment and regulation.

Which procedures and mechanisms should be adopted so that they form preventive assessment and self-regulation factors (determining the revision) of the planning and management system? To respond to these issues it is necessary to: (i) go beyond the positivist approach, that is, so that adaptive TM reaches the goal of sustainable urban planning with the resilient city having to attach *future studies* to the usual urban studies, i.e. speculate on possible scenarios so as to be able to assess future impacts and determine the measures or precautions to be taken depending on the desirability or undesirability of these; (ii) introduce automatic implementation mechanisms for assessment-regulation procedures in a systematic manner rather than timely or facultative, according to levels of scope and depth as well as differentiated temporal rhythms.

Thus, to ensure adaptive TM the following is proposed: (i) Undertake, as proposed by Carvalho and Gonçalves (2014), the exercise of construction scenarios which outline narratives forecasting what may happen, what we wish to happen, what should not happen and what we do not want to happen, enabling us to anticipate or approximate dynamic paths or trend trajectories which these may lead to. This will enable the better assessment both of measures oriented towards the desired strategic objectives and maintain monitoring on what may constitute a potential risk; (ii) Establish mechanisms within the integrated TM system which, as a rule, implement two planning cycles - the strategic cycle: implementation > strategic-assessment > review of strategic modelling > implementation of new policies > implementation programming, according to a more extended time period (e.g. political mandates) – the tactical cycle: implementation > systematic-assessment > tactical reprogramming of policies to be implemented > readjustment of the programming or even the urban implementation (Fig. 9).

Figure 9 – Planning cycles within the adaptive territorial management system



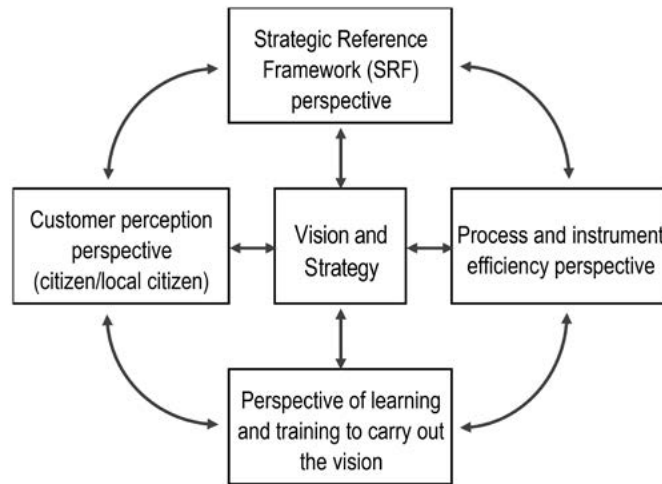
Source: Drawn up by the author

Assess the performance of the territorial management system

To respond to the functional multiplicity of the territory, the TM system has caused a proliferation in the sectoral policies falling under the remit of other administrative authorities. Alongside this, the agents and forms of entrepreneurial partnership for urban development have multiplied. In the meanwhile, the science of complex and self-organizational systems emerged which self regulates and evolves through incremental changes. Outdated deterministic planning has now been succeeded by open system management, capable of exchanging energy with its environment, but organisationally closed to be able to find its internal coherence (Queirós, 2009). In a complex system, the verification of results, if observed in a partial or segmented manner, does not confirm either its systemic coherence or its related re-adaptation to the evolution of the context and, therefore, neither with the principles of sustainability and resilience. With SM it is necessary to reconcile interests and establish options depending on the pre-assessment of the context and tendencies. For Queirós (2009), spatial planning is no longer limited to the institution and to the technical team. In fact, concerns are accentuated with the coverage and effectiveness of sectoral integration and its strategic dimension, involving numerous options and institutions which have become systems made up of networks of actors, both internal (planning process managers) and external (stakeholders...) who, together, direct the evolution of the planning processes. The design of spatial planning has become collaborative, shared, often turbulently (Healey, 1997), and dynamic as the parts interact to configure the *space of the networks*. The integrated planning of the territory therefore consists of a network where all points interconnect, with different intensities, adopting the complex behaviour resulting from the level of interdependence. Becoming more familiar with the problem of the complexity of the processes of territorial management, it becomes easier to find the path to achieve a better and more sustainable spatial management (Queirós, 2009). However, once the sectoral policies and the strategic development vision have been defined, this will have to be implemented and materialised. Policies focused on environmental or economic sustainability seeking harmonious development and social satisfaction will serve for nothing if that vision does not indeed mark the state of the territory and the socio-economic dynamics. Despite the efforts made in designing SM strategies, evidence of deficient planning persists. This proves that strategic planning, in SM, has remained a closed system and territorial management has not included the assessment of its own performance and the learning of new options and practices based on a systematised balance between the defined objectives and the results obtained. We have noted a failure of theory over the obvious need for integration between strategic planning and operative implementation management within SM. According to theories of integrated management applied to companies, strategic management should be assumed as an integral approach capable of aligning two fundamental processes: operational efficiency and competitive strategy. To this end, it is necessary to revise the current processes carried out by different agents within the system. In this context, the balanced-scorecard is a valuable tool, since it enables the monitoring of organizational performance within a perspective of interdependence with the strategy and promotes feedback for strategic planning (Kaplan, R. & Norton, D., 2010). The TM is carried out by a wide set of agents/actors, with differentiated tasks and objectives according to the different management levels and areas, each one with their interests and individual or sectoral strategies, and all this should be brought together, in an effective synergy, around a

single and coherent strategic vision (Fig. 10). Therefore, it is essential that all actors have a full perception of the overall TM system, and harmonise their knowledge, information and trained competences in the respective area of activity. In order to do that, it is necessary to have instruments facilitating management endowed with systemic assessment based on balanced indicators.

Figure 10 – Structure of balanced indicators for performance assessment



Source: adapted from Kaplan, R., Norton, D. (1996)

For the aforementioned systematic assessment, a system of indicators must be developed to measure the level of efficiency in each of the segments or functional cores of the SIGTEA, that is, for each one of the levels of activity (strategic, interim and operational) and for each of the areas of activity (prospective, regulation, assessment) and, therefore, delineate the profile of efficiency-performance for each agent (e.g. municipalities). Finally, with the composite indicators that define this profile it is possible to establish an integrated index that quantifies the level-of-performance that each TM agent shows within the SM framework. For example, considering the structural model of performance indicators (Fig. 10), it is possible to carry out performance verification from the perspective of the efficiency of the processes and instruments, i.e. in drawing up and applying the TMI inherent to the instrumental structure according to the proposed SIGTEA model (Fig. 8), thus reflecting the profile of the instrumental efficiency-performance.

Conclusion

The conclusions are set out according to the question raised at the start of this article, that is, how to achieve sustainable TM of the urban system, i.e., of the resilient urban development, capable of preventing or adapting excessive urbanisation dynamics which result in persistent situations of dysfunctionality and environmental deterioration; stagnation and urban diseconomy. These are organised into two parts, concurrently point by point, first the summary of the state

of the territory reflected in the results of the case study presented and then the statement of the potential benefits which the proposed innovations may bring if they were applied.

The impact of rapid urbanization and abrupt stagnation on the state of the SM: The following context was found: (i) The TM authorities, in classifying urban land and establishing its category of use, were not aware of this creating potential value (gains) which stimulated dynamics in the land market and in urban developments; (ii) Those dynamics took on an accelerated rhythm to the extent that the real estate supply market greatly exceeded demand; (iii) The municipal investment programme in infrastructure and collective amenities was oriented in terms of maximising demographic expectations influenced by the rhythm of growth in the housing stock; (iv) The investment initiative, the funding systems, the means of production and employment were attracted locally by the expectation of extremely high and rapid profits, with the general economy becoming too concentrated and dependent on the building industry and the real estate markets related to the new urbanisation; (v) The sudden indefinite and generalised stagnation of growth led to a scenario in which an immense number of infrastructures were ready to enter into service but without users/paying individuals, others unfinished and rapidly deteriorating, wasting energy in useless street lighting, and mistakes in the allocation of collective amenities; persistent debt and bad debt; proliferation of toxic financial assets, losses and bankruptcies in the means of production, high rate of unemployment; (vi) In the areas of accelerated urban growth, which lasted around a decade and a half, a somewhat faceless environment was created, not to say that of an actual abandoned works site, thus prejudicing urban living conditions.

Potential benefits of the innovations presented for a better and more resilient TM: (i) Carrying out a strategic-preventive TM, with medium to long-term urban foresight, where excessive, i.e. expansionist, optimism regarding growth and municipal development would be detected, and the TM agents could have established a more considered delimitation of the urban perimeters; (ii) Balanced-scorecard assessment cyclically analysing market dynamics, through urban econometrics, which would have enabled the first signs of slowing down to have been detected, and the (lack of) harmony between supply and demand and the taking of tactical regulative measures concerning urban programming and implementation; (iii) Systematic monitoring and assessment would have enabled the tactical regulation of the programming of the capacities of general infrastructures and collective amenities; (iv) Through a balanced-scorecard based TM system, investors and promoters and funding agencies would have been informed and could have made more considered choices in new development initiatives and wider investments in the real estate market; (v) Better preventive assessment of the size of urban perimeters and more timely regulatory action concerning growth would have enabled expansion to have been curbed and focus given to the existing urbanised space; (vi) Furthermore, during times of expansive urbanisation dynamics, the TM authorities could have triggered the procedures to revise the MMP, so as to reshape or reverse the course of events.

Final Note: The TM agents should integrate the subjects of economics and management in their planning action and schools of Economics and Management should increase their training activity in specific competences for Economics and Territorial and Urban Management.

References

- Alfasi, N. & Portugali, J. (2004). Planning Just-in-Time versus planning Just-in-Case. *Cities*, Vol.21, No. 1: 29-30.
- Bertalanffy, V. (1975). *Teoria Geral dos Sistemas*. Petrópolis: Vozes.
- Bina, O., Balula, L., & Ricci, A. (2014). Editorial: Urban Futures – Squaring Circles. In: *Conference Proceedings, International Conference URBAN FUTURES 2050 - Squaring Circles, Europe-China-World*, Calouste Gulbenkian Foundation, Lisbon.
- Carvalho, L. S. & Gonçalves, J. (2014). Lisbon 2030: urban visions for an Atlantic capital. In: *Conference Proceedings, International Conference URBAN FUTURES 2050 - Squaring Circles, Europe-China-World*. Calouste Gulbenkian Foundation, Lisbon.
- Cunha, J. L. (2012). “Apontamentos em Matéria de Programação Territorial”. F. P. Oliveira (coord.) *Direito do Urbanismo e Ordenamento do Território - Estudos*. Vol. I: 279-309. Almedina. Coimbra.
- Ferrão, J. (2011). *Ordenamento do Território como Política Pública*. F. C. Gulbenkian. Lisbon.
- Ferreira, A. F. (2005). *Gestão Estratégica das Cidades e Regiões*. F. C. Gulbenkian, Lisbon.
- Godet, M. (1996). *Manual de Prospetiva Estratégica*. Círculo de Leitores. Lisbon.
- Grave, L. (2013). “Nem planos sem programação nem programação sem plano – Alcance e resiliência do plano como instrumento de eficiente regulação e desenvolvimento urbano”. In: *Atas do Encontro “O Plano vale a pena? Incerteza e flexibilidade na gestão territorial*. AD URBEM. Coimbra.
- Grave, L. (2000). *Política de Solos e a Qualidade do Espaço Urbano – suas inter-relações*. Masters Dissertation in Regional and Urban Planning. Universidade Técnica de Lisboa. 110pp.
- Guiomar, N., J. P. Fernandes, N. Neves (2007). Modelo de Análise Espacial para Avaliação do carácter Multifuncional do espaço. *III Congresso de Estudos Rurais*. Universidade do Algarve. Faro.
- Healey, P. (1997). *Collaborative Planning. Shaping Places in Fragmented Societies*. MacMillan Press. London.
- Henriques, J. (2015). *As Dinâmicas do Mercado Imobiliário e os Impactos territoriais*. Chiado Editora. Lisbon.
- Henriques, J. M. (1990). *Municípios e Desenvolvimento*. Escher. Lisbon.
- Kaplan, R. & Norton, D. (1996). Using the Balanced Scorecard as a Management Strategic System. *Harvard Business Review*, OnPoint Collection, January-February: 37-47.
- Pardal, S.; Lobo, M. C.; Correia, P. (2000). “O conceito de planeamento”. In: *Normas Urbanísticas – Planeamento Integrado do Território*. Vol. IV, p:1-22. UTL/ DGOTDU. Lisbon.
- Pereira, M. (2009). Desafios contemporâneos do ordenamento do território: para uma governabilidade inteligente do(s) território(s). *Prospetiva e Planeamento*. Vol. 16: 77-102. Departamento de Prospetiva e Planeamento. Lisbon.
- Queirós, M. (2009). Teorias da Complexidade: princípios para o Ordenamento do Território. Texto de la tercera ponencia ‘Las dimensiones sociales y políticas del Medio Ambiente y la Ordenación del Territorio’. In: *XI Coloquio Ibérico de Geografía: La perspectiva geográfica ante los nuevos retos de la sociedad y medio ambiente en el contexto ibérico*. Alcalá de Henares.
- Rossi, A. (1982). *La Arquitectura de la Ciudad*. Editorial Gustavo Gili. Barcelona.
- Vale, M. (2007). Globalização e competitividade das cidades. Uma crítica teórica na perspectiva da política urbana. *Geophilia. Uma Geografia dos Sentidos*. CEG. Universidade de Lisboa. Lisbon.

CHAPTER 3

(Re)Organisation of Public Service Networks in Portugal from the Perspective of Territorial Resilience and Cohesion

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Introduction

This chapter aims to relate the reorganization of public services networks and innovation in their performance, questioning whether territories have become more resilient and cohesive or, on the contrary, more vulnerable.

To respond to territorial disturbances caused by globalisation (uncertainty, co-evolution, interdependence, rupture and marginality), new concepts have been adopted, particularly those of resilience and territorial cohesion. The former refers to the capacity of territories to adapt and resist to external shocks, without collapsing, and constructing sustainable and creative solutions; the latter, based on the cohesion policy of the European Union (EU), seeks to profit from territorial diversity, through concentration, cooperation and connection, so as to attenuate development divergences at different levels within the EU.

Amongst the alterations, what stands out is the decrease in the weight of the State and intrinsic consequences in the reorganisation of public service networks. Thus, from the 1980s onwards, in most European Union countries, and a little later in Portugal, there was both the restructuring of public service networks with face-to-face assistance (as seen in mergers, re-conversions or even closures of units), and their growing use/provision of information and communication technologies (ICT). These changes, started as a result of the adoption of neoliberal policies, the assimilation of new public management models with growing ICT resource, and the diversifications of target-public needs and demographic alterations, were amplified by the economic and financial crisis, obliging the State to adopt a more rational management of its resources.

The chapter is organised around three topics: it starts with a theoretical discussion on the evolution of public services supply paradigms, linking this to concepts of territorial resilience and cohesion; this is followed by a brief description of public services in Portugal, focused on those related to education, health, justice (courts) and administrative matters (i.e., finance service, social security and registries and public notaries); finally, based on a survey of resident populations about the use of those services, three regional case studies are analysed, providing examples of territories with different dynamics: densely urbanised metropolitan territory (six municipalities of the Lisbon Metropolitan Area), a rural-urban axis (six municipalities within the Évora-Beja axis) and a low-density rural area (the four border municipalities of the Baixo Alentejo).

Public services, territorial resilience and cohesion

Paradigm shift in the provision of public services

From mutation of agents to service provision challenges

In recent decades, public services in Europe have recorded marked changes resulting both from ideological options underlying the dominant political paradigms (with progressive deterioration of the Welfare State) and corresponding provision models (direct intervention of the State, multiple partnerships and forms of contracting), as well as shifts in the demand profile (namely ageing, reduction in family size and urban concentration).

Pinch (1989, cited in Alves, 2005a) identified nine key aspects in the restructuring of public services: (i) proliferation of self-service; (ii) increase in labour productivity through new functional organisational forms and/or methods of management; (iii) investment in technologies to increase production, causing more unemployment and the foreclosure of equipment; (iv) subcontracting of services to specialised companies; (v) the fostering of quality due to improved skills or training of employees; (vi) materialisation of service functions; (vii) relocation of establishments to areas where land prices are cheaper; (viii) the provision of service functions in households; and (ix) centralisation of services into larger units, reducing or closing smaller units. For the authors, the pressures to increase effectiveness and efficiency and to concentrate services in larger spaces (such as governmental one-stop-shops) have similar criteria for both the public and the private sectors. For Marques (2009:25) it is necessary to “import into the public administration what the competition imposes daily in private organisations: customer orientation, promotion of quality, user satisfaction, economy costs, increasing productivity, developing partnerships and modernising policies, which should be a continuous process and not just a moment with a beginning and end.”

The demand for public services has grown in the last decades as a result of their universalisation (particularly health, education and social security systems) as well as public administration interventions when acting as regulator (Alves, 2005b). New demographic and family structures play a crucial role in the changing demand for public services, with there being more citizens covered by access to public services and, in addition, the ageing of the population and the reduction of the number of elements per family require appropriate responses.

Socio-economic changes have been far-reaching and include: (i) the integration of Portugal within the European Community (1986), which was very important for the economic growth and the development of the country and this influenced the number, geographical distribution and use of public services; (ii) the entry of women into the labour market, including jobs in public administration and simultaneously creating new needs regarding the demand for services; (iii) the increase in household income; and (iv) the improvement of the educational levels of citizens. The combination of these factors have made citizens more demanding and consumers are willing to travel a greater distance to obtain services with better quality standards, even at a higher economic cost (Tomé, 2011). However, recent changes in the labour market have led to an increase in the number of unemployed, and this requires the provision of more social benefits (particularly social security and the exemption or reduction of fees for health care services).

The dynamics of public services have also been conditioned by improvements in accessibility. Portugal built and improved its road system, partly with European funds, and now has 2860 km of motorways, (while in 1986 it had less than 200 km) along with an increasing rate of motorisation (245 cars per 1000 inhabitants in 1991 and 452 cars per 1000 inhabitants in 2014 - authors' calculations with data from INE, the National Statistical Institute of Portugal). This progress in accessibility, mobility and purchasing power contributed to the increase in journeys using private cars and the reduction of mobility by public transport and walking (INE, 2003; Tomé, 2011), as well as changes in the urban system, in particular: (i) the rise of the first residences in suburban spaces, contributing to the expansion of metropolitan areas; (ii) the increasing segmentation of social spaces; (iii) the creation of new user needs that led to new services for the population; (iv) the emergence of new urban centralities, spaces and service facilities for the population; and (v) the integration of the territories and the services provided in cooperation networks at different scales (e.g., regional and municipal). These socio-territorial changes have led to regional imbalances in the distribution of services, with excess or unsuitability for the elderly population in the inner city, and a deficit in the peripheries.

Benington and Hartley (2001, quoted in Hartley, 2005) suggest three different models to manage public services (Table 1).

Table 1 – Evolution of public services in recent decades

	TRADITIONAL PUBLIC ADMINISTRATION (1950-80)	NEW PUBLIC MANAGEMENT (1980-2000)	NETWORKED GOVERNANCE (2000-...)
CONTEXT	Stable	Competitive	Continuously changing
Population	Homogeneous	Atomized	Diverse
Needs/ Problems	Straightforward, defined by professionals	Wants, expressed through the market	Complex, volatile and prone to risk
Strategy	State and producer centred	Market and customer centred	Shaped by civil society
Governance through actors	Hierarchies, Public servants	Markets, Purchasers and providers, Clients and contractors	Networks and partnerships, Civic leadership
Key concepts	Public goods	Public choice	Public value
Innovation	Some large-scale, national and universal innovations	Innovations in organizational form more than content	Innovation at both central and local levels
Improvement	Large step-change improvements initially, but less capability for continuous improvement	Improvements in managerial processes and systems. Customer focus produces quality improvements in some services	Aiming for both transformational and continuous improvement in front-line services
Role of policy-makers	Commanders	Announcers/ commissioners	Leaders and interpreters
Role of public managers	'Clerks and martyrs'	Efficiency and market maximizers	'Explorers'
Role of the population	Clients	Customers	Co-producers

Source: Adapted from Benington and Hartley (2001, cited in Hartley, 2005)

Table 1 shows that the relationship between public administration and social agents (individual or collective) is increasing, contributing to the co-architecture, co-production and co-evaluation of public services. According to Marques (2009:136), this is “the emergence of a new paradigm of public service, in which the dependence of the citizen is replaced by a relationship of interdependence, with contributions from citizens, families and social organizations. It thus facilitates opportunities for this co-production.” Needless to say, this differs with the type of service, the entity that manages it and the geographical scale (national, regional and local).

The evolution of physical and on-line formats: features and implementation strategies

Recent developments in public services have been marked by concentration, integration and specialization. The public services of education, health and justice are traditionally offered in their own facilities, with their hierarchy/specialization following the urban system hierarchy. However, priority has been given to aggregating them into larger units along with integrated management for various existing facilities in the same territory. The use of electronic resources is still limited, since the provision of these services requires territorial presence and direct interpersonal relations. Public services of an administrative nature (e.g., finances, registries and public notaries or social security), although continuing to be offered in specialised government departments scattered throughout the territory, almost always in the head offices of municipalities, are now being offered in other formats, both physical and electronic. Of note among the former are the single-window services, the main objectives of which are to minimize the time and costs of providing these services and help the citizen by offering information and services from various public entities within the same space, almost always with extended schedules and at accessible locations (Table 2).

Table 2 – New forms of provision of public services of an administrative nature

DESIGNATION	CONCEPT	EXAMPLE
Information centres	Aimed at improving the services provided to citizens through the provision of information or services on the Internet or by phone	Citizen’s Portal; Company’s Portal.
Single-window service centres	These make it possible to find various public services, of a public nature (headed by various ministries) or private (mainly energy, communications and transport) in the same place	Multi-purpose Administrative Services Centre (<i>Loja do Cidadão</i>); Multi-service desk.
Centres for specialised services	Targeted to a specific need	Lost Wallet Desk; Company Space.

Source: Adapted from Bent, Kernaghan and Marson (1999)

For Bent, Kernaghan and Marson (1999), Coutinho (2000) and Marques (2009), these three models contribute to a provision of services which is simpler, more affordable, convenient and personalized. However, in these formats the service offering is very much targeted to the services of each entity most sought after and, therefore, the most standardised ones. From a territorial

point of view, information centres, single-window service centres and specialized service centres can contribute to the reduction of trips and, in low-density areas, can also minimize the impact of the closure of some of these public services.

Regarding the provision of public services on the Internet, the process is incremental, as shown by the Gartner Group (Baum and Maio, 2000). In the first stage of the model (Presence) only institutional information is provided (e.g., mission, contact details, opening hours and official documents) and this content is usually out of date and is therefore not very interesting or useful for citizens. In the next stage (Interaction) more information is available, enabling citizens to carry out searches, download or fill out forms, directly contact services or employees and access other related sites on the Internet. In the third stage (Transaction), it is possible to provide a full service through the Internet (i.e., service formulation, payment and delivery). Finally, in the fourth stage (Transformation), there is a link between citizens and the various public administration agencies. In addition to the high level of updating, robustness, security, reliability and the existence of teams specialised in these areas, the public services policy provided on the Internet is framed within a medium to long term strategy. There are normally common and integrated networks and platforms involving various public administration agencies, such as single-window desks, which enable citizens to only have access to a single contact point with the public sector, independently of the service or body providing this.

The great availability (and robustness) of the public services on the Internet has impacted on the (re)organisation of their physical networks, to a large extent due to cost differences; using Denmark as an example, Tinholt (2013) shows that internet service provision costs may be less than 1/3 of face-to-face services. This reduction reflects the transference to the user of functions previously performed by employees. With the generalisation of this model the State reduces costs, but this contributes to job losses, with an economic attitude overriding a social logic. The benefit to the citizen is mainly linked to convenience and to the disappearance of being subject to a working schedule, but does not avoid penalisation (for some) due to info exclusion. Thus, with the growing spread of the Internet and the increased ability of citizens to use ICT, public administration has tended to reduce its territorial presence and adopt new forms of services provision, enhancing the added values brought by technological innovations. It is therefore necessary to find a compromise between the incorporation of technology and the spatial distribution of establishments bringing together all users – whether young or urban, more qualified and willing to access Internet-based services, or a more elderly public, who prefer face-to-face support – and not remove social functions, and the animation and movement caused by public services, from the territory.

Public services, spatial justice and territory

Accessibility and “territorial proximities”

Public services are essential in the organisation of the territory, affecting the daily lives of their population and attracting new residents and businesses. They play a central role in the urban system matrix and in interdependency relations. The reorganisation of their networks

(along with changes in road access) enhances adjustments in the urban hierarchy and in the interrelationships between places, both in densely urbanised and low density territories. In the latter, reinforcing the relative proximity between places, the rarefaction of the population and social policies focused on cost reduction have tended to favour the concentration of services in the larger urban centres, which are better equipped and more accessible, thus accentuating inequalities regarding access, particularly in more outlying territories.

Distance and territorial proximity are therefore fundamental concepts when the provision of public services to the population is in question, given its universal tendency. Proximity is much more than the geographical distance between two or more points and may be analysed in different ways: (i) physical proximity, i.e., the (geographical and temporal) distances which citizens/users have to travel until they reach the establishment offering the service; (ii) temporal proximity, i.e., the period of time between the emergence of a need and the actual provision of such a service; (iii) social proximity, i.e., the existence of services to the population and the conditions under which inhabitants, independent of their social origin, may utilise them; (iv) cultural proximity, i.e., the greater the distance between places of residence and the provision of service, the less identification there may be, particularly regarding rural populations; and (v) symbolic proximity, i.e., the existence of a service in a geographical area may indicate the presence of the State alongside the population, in the light of the subsidiarity principle (CORUM (ed.), 2001). These five types of proximities cut across the territory, testifying to their importance in differentiating the supply of and demand for services.

In this way, services which are closer or more distant may form social inclusion or social exclusion vectors. Recent research has focused on the appropriation of the use of public services by citizens, creating/reinforcing local identities and contributing towards improving governance practices and the design of services. However, as Chauvière warns (2001:124), “proximity is a guiding principle which, above all, shows political will.” Indeed, neoliberal public policies that favour economic logics tend to favour concentration, penalising supply based on proximity; on the contrary, policies critical to this way of thinking seek a greater equilibrium between the meeting of economic objectives and the coverage of social needs. The confrontation between these perspectives has been evident in policies in recent decades in Portugal, with governments sometimes defending models of greater proximity in health, education, justice and security and at other times focusing on more concentrated models, in accordance with guidelines from the *troika* (2011-2014).

Amongst the challenges which research into “proximity” faces is the degree of flexibility of the concept and its relationship with the geographical scope of its application. Traditionally, such research has studied consolidated urban centres and, to a lesser extent, rural areas. However, these are scarcer in relation to suburban spaces, which has resulted from an accelerated and unplanned urban expansion which, therefore, has its own specificities (e.g., at the level of the availability and quality of the space intended for services to the population). The residential emptying of city centres has also created specific problems related to access to services by their residents, often with reduced mobility and economic constraints. In this sense, it is important to reflect on the proximity/accessibility of services in the outlying areas to the major urban centres and in their central areas, as well as applying research concepts and techniques in case studies at a larger scale to the neighbourhood. In low density rural areas, where the population

is ever more rarefied and aged, accessibility to public services requires another type of approach (for example the itinerant supply of services) since the improvement in accessibility provided by new road infrastructures is often more apparent than real; in fact, in many cases the new highways link regions within a “long-distance” logic, but have difficulty in “serving” those who live there, who become dependent on the local road network, which is often run-down and which imposes more lengthy travel times than those listed in the technical reports.

Social and spatial justice in the distribution of public services

The neoliberal vision of the administrative and social organization of the State favours a “mercantile” logic difficult to reconcile with the social satisfaction of citizens’ basic needs, which have to be guaranteed by the State. Underlying that perspective is the privatization of public services with market potential, which can be facilitated by restrictive operating policies compromising its quality (Hespanha, Ferreira, and Pacheco, 2013). The State may not have an underlying purely accounting view, since “the Welfare State should be seen not as a mere expense (or fat), but rather as an investment which, in addition to ensuring a set of rights and basic levels of provision, represents an indispensable means for the economic and human development of society in the long term. The Welfare State is not fat, it’s muscle!” (Barata and Carmo, 2014:20-21).

Within this framework, the concepts of social and spatial justice owe a lot to the contribution of Harvey (1973). For this author, social and territorial justice in the distribution of services to the population implies: (i) spatial efficiency, as translated into minimising the distance to travel between the offer and the demand for a certain service; (ii) social justice, related to equity regarding access to supply, which is beyond the geographical conditions; and (iii) territorial justice, close to “optimal spatial distribution”. In turn, Rivas (2012:77) summarises them in two key points: (i) “income distribution should be such that: a) all the needs of the population within each territory are covered; b) resources are made available in order to minimize regional multiplier effects (reinforcing positive externalities); and c) additional resources are invested to help overcome the difficulties caused by the physical and social environment”; and (ii) “(institutional, organisational, political and economic) mechanisms must be such that the disadvantaged areas should be helped as much as possible.” In this reasoning there is a logic of positive discrimination, without which it does not seem possible to speak of (social) justice. Therefore, the principles of spatial and territorial justice must underpin the management models of services to the population - especially the focus on efficiency - and therefore their design and distribution require integrated sectoral and territorial policies and strategies.

Territorial-based policies

Multi-scalar approaches

A fair spatial distribution of public services requires a systemic and relational approach, characterised by the ability to integrate policies to various scales, considering aspects such as

institutional models and governance, the specific aspects of the territory, the population and the productive system, and the level of openness to innovation, among others. New dynamics arise with the (re)combination of these factors, which will impact on the design of public policies.

Public services policies and territorial policies should be ever more open to the participation of social actors. As Marques (2004:423-6) mentions, it is "essential to think of constructing spaces of governability based on variable institutions, supported by mutual trust, tacit understandings and the effects of collective learning. This involves the fostering of cooperation subordinated to a spatial governance strategy."

The inclusion of these practices is not easy, nor immediately applicable, but it is necessary to introduce them in public management, whether the services for the population or the territories. This may take the form of processes involving the exchange of information and learning between agents, in a greater sharing of and accountability for decisions taken, within the stimulus of a new institutional culture, oriented by dialogue and consultation, and in obtaining economies of scale, in which cooperation networks are established and resources enhanced. Given this, public policies and governance models should be substantiated through flexible planning processes based on territorial cooperation. In this regard, Ferrão (2000) and Marques (2004) recommend three levels of strategic positioning for Portugal: (i) municipal; (ii) inter-municipal; and (iii) regional. According to Marques (2004:425), "these scales for a strategic approach (...) form a type of different geostrategic layers." Thus, at the municipal scale, there should be networks of services and essential facilities for maintaining populations which, given temporal and spatial specific aspects, can provide a balanced and integrated experience, with governance involving varying geometries. However, the local scale is ambiguous, and administratively this may take place at the level of the parish and the municipality, both with extremely heterogeneous dimensions. In metropolitan areas, there are parishes with more than 50,000 inhabitants and in low-density areas, municipalities with less than 2,000 inhabitants and parishes with less than 100 inhabitants. Given that the municipality is the reference point for the sizing and location of public services, those discrepancies are not always suitably provided for. The inter-municipal level has gained importance because "the lack of scale and functional diversity suggests cooperation between cities and between territories, through which benefits from economies of scale can be achieved" (Pereira, 2009:87). The regional scale seeks to integrate all the features of the territory, exploiting its complementarities, in a multipolar urban system, where different spaces for residence, work, consumption and leisure coexist, as well as a variety of population profiles. Hence there is a need to ensure compliance with policy goals at the national level, but adapting the programming criteria to specific territorial features and dynamics. The OECD (2011:2) recognises these particular aspects in stating that "rural and urban areas face different challenges. (...) Urban areas should not be seen as separate entities. (...) Urban-rural partnerships, under certain conditions, may act as a source of regional competitiveness, through the creation of externalities resulting from mechanisms of complementarities and synergies generated." Services to the population might play an important role, since they satisfy social needs, contributing to their quality of life and the greater attractiveness of territories.

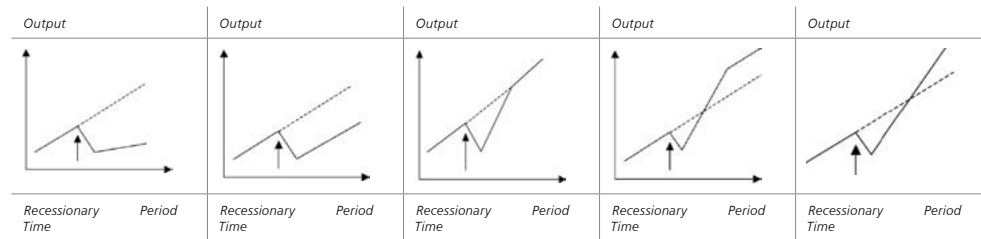
Public policies, territorial resilience and cohesion

The presence of the State, through social and administrative public services, is decisive for development and territorial cohesion. In the more peripheral and/or outlying territories this ensures social conditions of permanence for the residents; in the more dynamic territories, this supports the population and the business community, contributing to reinforcing its competitiveness. The European Commission (2004:4-5) states that "services of general interest continue to be essential for social and territorial cohesion and for the competitiveness of the European economy". Citizens and companies rightly expect to have access to quality services of general interest at accessible prices throughout the European Union.". The same document argues that "the supply of quality services of general interest (...) contributes to attaining the strategic objective of the Union, which consists of making the economic space more dynamic and competitive in a knowledge-based world, able to ensure sustainable economic growth, with more and better jobs, and more social cohesion" (European Commission 2004:5). The Green Paper on European Territorial Cohesion (European Commission, 2008) launched the discussion on the concept, applicable to different scales and a multidimensional nature, considering territorial quality, efficiency and identity. Given the importance of public services for territorial cohesion, it is imperative to emphasise the importance given by that document to the fair and balanced access to facilities, to the infrastructures and to knowledge; to the need to develop forms of cooperation, improve governance and foster public-private partnerships; and to readjusting the administrative network, without compromising institutional cohesion.

However, the territorial cohesion policy of the European Union has not had the success expected, not only due to the urgent integration of countries with distinct social and economic realities (2004), but also because of the onset of the economic and financial crisis (2008). Known the diversity and divergences which characterise the present-day Europe, territorial cohesion policy, limited to rhetorical discourse, has gained relevance and practical justification. Given the vulnerability of many of the territories due to the crisis and the added level of political and economic unpredictability, it can be argued that public policies take principles inherent to this concept as a reference. As Marques (2009:18-19) emphasises, "changing from a management of predictabilities to a management of probabilities, in a global world where no government controls every factor (...) requires public and private organisations to be more adaptive and resilient.". The social reform of the State, in its administrative part and its public services, cannot therefore be carried out as a result of the application of general formulas without meeting the specific characteristics of the territory, and the concrete needs of the population residing there, as this would lead to the acceleration of regressive trajectories. Indeed, a modern and dynamic system of public services, capable of adjusting itself on an ongoing case-by-case basis to the needs of the population and transformations in the business fabric, contributes to making territories more resilient, albeit with varying responses. The typology proposed by Martin (2012) for regional economic systems can be adapted to the different territorial scopes within this proposal. According to this writer, after a recession, the responsiveness of an economic system can take five paths: (i) the impacts on the regional economy are so severe that they prevent the resumption of the pace of previous growth (Figure 1A); (ii) the system can recover its growth rate, but only partially (Figure 1B); (iii) in the medium and long term, the system returns to

its performance prior to the disturbance (Figure 1C); (iv) after an initial phase of turbulence, changes in the system result in increasing the growth rate in the medium term, but this will tend to decrease in the long term (Figure 1D); and (v) the economic system recovers from the shock, adapting to the new circumstances, resulting in a constant rate of growth in the medium and long term, which exceeds the expected economic performance before the recession (Figure 1E).

Figure 1 – Response capacity models for a regional economic system



Reading Note: The continuous line represents the performance of the regional economic system, while the broken line represents the expected performance if a recessionary shock had not occurred.

Source: Adapted from Martin (2012)

Furthermore, according to Martin (2012), the construction of the strategy based on resilience implies attending to the resistance, recovery, reorientation and renovation capacities of a regional system. Now, in this transformation public services are decisive because: i) they compete to ensure living conditions for the populations and the functioning of companies; ii) when modernised, they are drivers of that process.

The next section summarises the recent development of public services policies in Portugal and, later on, taking as reference three distinct territorial realities, some effects of its application are discussed in terms of territorial resilience and cohesion.

Public services in Portugal

Public services as a pillar of the Welfare State

Following the democratisation of the country, the Constitution of the Portuguese Republic (CRP, 1976) determined that the State is to provide a set of public services for the population, to ensure fundamental rights such as education, health and justice, along with a network of administrative services.

Regarding education, by the time of joining the EEC, the system was democratised at all levels. Compulsory schooling was fixed at nine years by the Framework Law of the Education System (Law No. 46/86, of 4 October) and higher education expanded and diversified, and so Polytechnic Institutes and Universities were also set up away from the urban littoral areas. Since then, compulsory schooling was extended to pre-school education (Law No. 5/97, of 10 February) and also extended to the 12th year (Law No. 85/09, of 27 August). This evolution has imposed

permanent modifications on the networks, in terms of their expansion or contraction, in trying to respond to the dynamics of demand (at the various levels of schooling) and policy guidelines at the planning level and the types of schools. Despite the variety of situations, the dominant trend has been one of concentration and vertical and horizontal integration of existing schools in specific geographical territories, which is inherent to the concept of “educational territory”.

The area of Health witnessed the consecration of the National Health Service (*Serviço Nacional de Saúde - SNS*) (Law No. 56/79, of 15 September), in which the State safeguarded the right to health protection through institutions and services providing comprehensive care to the population, financed through taxes, having set up a network of facilities providing services, from primary to more specialised care, of different typologies. The 1990s saw new reforms, in particular the Framework Law for Health (Law No. 48/90, of 24 August) and the new Law for the National Health Service (Decree-Law No. 11/93, of 15 January). This reform enhanced the private sector and envisaged the private management of health units. In 1999, the concept of Local Health Systems (*Sistemas Locais de Saúde - SLS*) was created (Decree-Law No. 156/99, of 10 May). It established functional links between health centres, hospitals and other services. In 2001, the Hospital Referrals Networks (*Rede de Referência Hospitalar - RRH*) was created, seeking to regulate complementarity relations and technical support between all hospital units and, in turn, between the hospitals and the health centres. The 2004-2010 National Health Plan altered the guidelines of previous policies, advocating corporatisation and public-private partnerships in the sector. To summarise, the SNS consecrated the universality of the system, the State’s responsibility as a healthcare provider and the importance of primary health care. The implementation of the network of facilities necessary to meet those objectives was supported through structural funds. Despite the investment made, problems in accessing SNS resources have remained (e.g. millions of citizens still do not have a General Practitioner and the number of people on surgical waiting lists remains high). The difficulties of the public health system being able to respond to the growing demand pressure (exploited by private groups which have chosen health as a business area) has led to the introduction of the concept of a “tending to be free” service changing to a “tending to be paid” service and the strengthening of contracting. However, private investment has focused mainly on densely urbanised areas, thus contributing to accentuating the marginalisation of low-density territories.

In the area of justice only the territorial matrix of the judicial system was addressed, particularly that of the courts. Between the mid-1970s and the end of the last century, the key elements of the judicial system were the circuit courts (39 in 1977; 58 in 2000). In 1988, 43 *círculos judiciais* were established, and there were 79 in the year they were dissolved (Law No. 3/99, of 13 January). Districts and district courts changed, respectively, from 216 and 175 in 1977 to 233 and 130 in 2000. This was therefore a judicial organisational model based on geographical proximity. In the 1990s modifications to constituencies and the aggregation of districts occurred, along with the establishing of new courts and further specialisation. However, in the first decade of this century, the need was felt for a legal matrix more adapted to social and technological changes, the new types of crime and the emergence of extremely large cases, which led to the 2008 reform (Law No. 52/08, of 28 August).

In addition to education, health and justice services, this analysis also includes a set of services of an administrative nature which have undergone organisational and technological changes

which have changed their relationship with the user. Of note, amongst these, are tax offices, social security services and registration services (civil, land, commercial and vehicle registries) and notary offices. These services have a territorial matrix based on main district centres, and there has been a gradual expansion and dissemination of these networks in densely urbanised areas. Their modernisation has taken place in three ways: major technological investment seeking to digitalise services (above all tax services, due to the need for the State to maximise its tax collection); the introduction of multi-service and electronic formats; privatisation of notary offices (Law No. 49/2003, of 22 August 2003; Decree-Law No. 26/2004, of 4 February, altered by Law No. 51/2004, of 29 October) and the subsequent reduction in public notary offices.

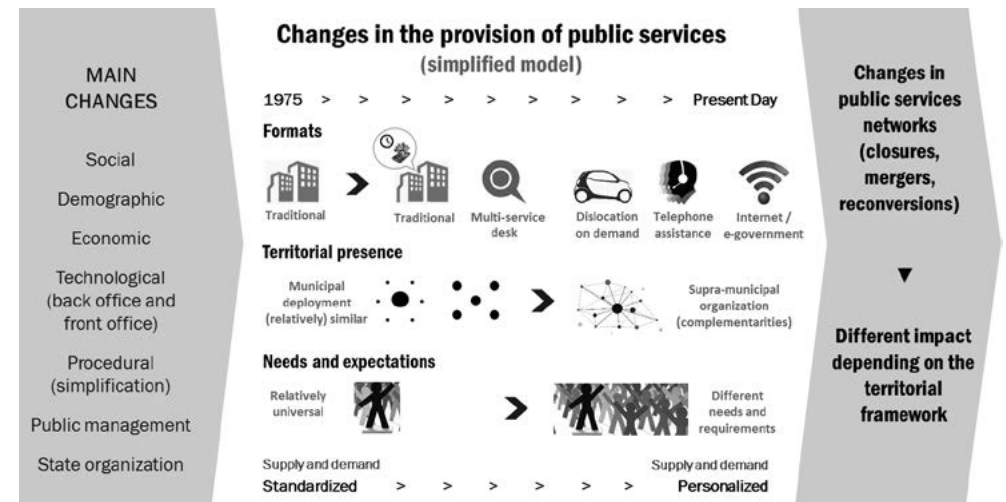
So, in the first twenty years, the country experienced rapid economic changes (increase in purchasing power, the making of the tertiary sector of the economy), social changes (reinforcing the middle class, feminisation of the labour market) and demographic changes (falling birth rate, increasing life expectancy, ageing, decrease in family size, marked urbanisation and littoralisation), which required ongoing flexibility of policies and facilities and support infrastructures. At the same time, there was growth of private investment and services traditionally provided by the State, in particular education and health, focusing on urban areas where the population with greatest purchasing power was concentrated. These dynamics, caused by a combination of multiple factors, often with contradictory effects, brought about mismatches between supply and demand, forcing, at the turn of the century, both the reorganisation of public networks, seeking greater rationality and efficiency, and the adoption of types of contracting between public and private sectors.

With the economic and financial crisis (2008), this reorganisation underwent major changes, in its rhythm (suspension/postponement of ongoing and/or projected investment), in terms of process (closure, concentration and privatisation) and in its actors (decentralization of competences to local authorities, strengthening of private companies and foreign capital). The request for financial assistance and the arrival of the *troika* required a reduction in public expense, with this causing major repercussions in the implementation of facilities and the human resources linked to the provision of these services.

As such, the subsequent analysis is based on the most recent changes, carried out by the 17th Portuguese Constitutional Government (2005-2009), but undermined by the outbreak of the crisis, which eventually led to the fall of the following Government (2009-2011). The 19th Government (2011-2015), strongly limited by the impositions of the *troika*, based its actions on reducing public expense through: i) the drastic reduction of public investment and management expenses; ii) the favouring of privatisation.

Figure 2 summarises the main changes carried out in public services in Portugal, considering changes in (socio-economic, demographic, technological and organisational) values; the evolution of formats, their territorial presence and the adaptation to the needs and expectations of users; the impacts in the level of services and of territories.

Figure 2 – Evolution of public services in Portugal (1975-2015) - a summarised vision



Source: Own elaboration

Effects of the crisis on the reorganization of public services networks

Education

During the 17th (2005-2009) and 18th (2009-2011) Portuguese Constitutional Governments, major reforms were started in the school network, particularly (i) the extension of preschool educational supply, making it compulsory and increasing the number of establishments, through the creation and direct management of local public administration and the formalisation of agreements with social economy entities; (ii) the reorganisation of available schools, closing primary schools with less than 21 students; and (iii) the creation of the Modernisation Programme for Existing Secondary Education Schools.

In 2011, the signing of the *troika's* Memorandum of Understanding did not impose major changes in this area. Capucha, Duarte and Estevão (2013:291) assert that the document "is scarce in its references to education". However, the document still stated that a reduction in expenses of around 195 million euros was expected, along with the creation of new school clusters.

The main measures presented therein mainly envisaged aspects related to the quality of education, drop-out from school, entering the labour market and a greater investment in vocational education, with an increase in the number of state schools offering this.

The government in office between 2011 and 2015 carried out certain policies of its predecessor, particularly the rationalisation of the supply of schools in territories with a low number of students, but suspended the Modernisation Programme for Existing Secondary Education Schools. The Guide for State Reform (Government of Portugal, 2014) proposed to: (i) endow municipalities with greater competences, through contractual delegation, in new educational cycles and the management of existing state schools in their district; (ii) grant

greater autonomy to schools, to specify their educational mission in line with national guidelines (through contracts providing autonomy); (iii) formalise contracts of association with private entities, in territories where state offer is reduced and educational failure greater; (iv) provide families greater freedom of choice in selecting the educational establishment of their wards, by granting them education-cheques (experimental project); (v) focusing on vocational education, through increasing the total number of secondary school students attending such courses by around 50%; (vi) rationalise the training offer in higher education and create a cycle of education, with a duration of 2 academic years, to train senior professional technicians.

Table 3 shows recent evolution of supply and demand in educational establishments in Portugal in three academic years, 2008/09 corresponding to the intermediate year of the triggering of the crisis. In the first period the trend is for growth of supply and demand, with the exception of the 1st and 2nd cycles, where the demographic effect and rationalization of networks (closure and/or grouping of schools) are very evident. More recently, the reduction in the number of establishments and the number of students is only slightly contradicted in the provision for the 2nd cycle and the secondary population. With regard to the weight of public education of note is, on the one hand, the reduction in supply at all levels and on the other hand, the strengthening of demand, particularly since the crisis began.

Table 3 – Evolution of supply and demand by level of education in Portugal

		2000/01		2008/09		2013/14	
		N.º	% public	N.º	% public	N.º	% public
Pre-school	Establishments	6624	67.2	6981	65.8	6301	62.4
	Students*	235.6	49.8	274.6	51.8	265.4	53.5
1st cycle	Establishments	9416	94.0	5865	90.4	4645	88.4
	Students*	535.6	90.2	488.1	88.8	424.8	88.1
2nd cycle	Establishments	1418	83.9	1159	78.2	1201	78.0
	Students*	271.8	89.7	271.9	86.9	249.8	87.7
3rd cycle	Establishments	1357	82.9	1515	77.7	1469	78.6
	Students*	415.8	89.7	523.2	81.2	383.4	87.6
Secondary	Establishments	859	61.5	927	59.8	958	60.2
	Students*	413.7	83.2	498.3	75.8	385.2	79.3
Tertiary	Establishments	**	**	**	**	293	43.7
	Students*	387.7	70.6	373.0	75.7	362.2	83.3

Legend: *Students in thousands; **No data

Source: Direção Geral de Estatísticas da Educação e Ciência, <http://www.dgeec.mec.pt/np4/home>

Health

In the 17th and 18th Portuguese Constitutional Governments, one of the central pillars of health policy involved the reform of primary health care, making it more accessible to citizens and increasing demand for it as the first option, rather than hospitals. One of the aspects of this policy was the reconversion of health centres into Family Health Units (*Unidades de Saúde Familiar - USF*), provided with new services (such as oral health and specialised appointments) and linked to other services within the health network. In practice, these units provided for reinforcing GP (general practitioner) coverage which, according to Crisóstomo (2013), had incorporated 570,000 new users since 2006. There were no hospital restructuring policies with significant territorial impacts, but the National Network for Integrated Long-term Care (*Rede Nacional de Cuidados Continuados Integrados - RNCCI*) was set up (Decree-Law No. 101/2006, of 6 June). With the 18th Government already feeling the effects of the crisis, concern with the economic and financial sustainability of the SNS assumed a greater importance.

The recommendations of the *troika* in 2011 were in the same direction. With regard to service networks, references were only made to primary care and hospital centres. In the former, the document recommended an increase in the USF and the guaranteeing of a greater number of doctors in disadvantaged areas, to reduce territorial disparities in the access to and use of health services and the allocation of more general practitioners. With regard to hospitals, the *troika* argued for their reorganisation and rationalisation, based on the concentration and specialisation of services, in a joint hospital management model. It should also be mentioned that some of the services of the hospitals were able to be transferred to the USFs. In the opinion of Crisóstomo (2013), the *troika's* proposals, shaped by financial imperatives, could have prejudiced the universal and equitable nature of the service.

According to the Guide for State Reform, the current SNS model no longer responds to the needs of the population, who have very different living and hygiene conditions from those at the time of its setting up. However, the document mentions that “the issue of insufficient overall financing for the health system cannot be avoided, along with the scarcity of professionals, demographic pressure and inadequate clinical and geographical management of units in need of modernisation. The sustainability of the SNS is not an objective in itself, but it is a means so that Portugal can continue to offer a universal access system” (Government of Portugal, 2014:88-9). The measures proposed in the health sector include the following: promoting efficiency to ensure medium and long-term sustainability; reinforcing proximity between citizens and public primary health services, to reduce social and territorial inequalities; increasing the network of long term care services; encouraging the involvement of private entities and the social sector in providing public health services (Government of Portugal, 2014).

Table 4 shows the evolution of some indicators for the health system, taking 2008 as the reference year. Generally, there has been an increase in human resources per 1000 inhabitants and a strengthening and stabilisation of health facilities, with the exception of health centre extensions, which have suffered a notable fall. This can be explained by a reduction in population in rural areas by efforts to concentrate uses into health centres, which are better equipped offering more services.

Table 4 – Evolution of some indicators for the health system in Portugal

	2001	2008		2013	
	Total	Total	The Public Sector	Total	The Public Sector
No. hospitals	217	189	48.7%	226	52.7%
Hospital beds	42089	35803	*	35478	69.2%
Beds/100,000 inhab.	407	339.1	249.7	339.3	239.1
No. health centres	392	377	100%	387	100%
Health centre extensions	1953	1778	100%	1199	100%
No. doctors	33233	38932	81.9%	45289	87.7%
Doctors/1000 inhab.	3.2	3.7	*	4.3	*
No. Nurses	40230	32965	89.9%	36990	90.1%
Nurses/1000 inhab.	3.8	5.4	*	6.3	*

Legend: *No data

Source: INE, Statistics Portugal, <https://www.ine.pt>

Justice

Public services relating to justice underwent successive alterations in the organisation and operation of courts as initiated by Law No. 52/2008, of 28 August. In 2011, the legal system consisted of three geographical levels (Law No. 46/2011, of 24 June and its respective regulation): 4 Legal jurisdictions, with headquarters in Lisbon, Porto, Coimbra and Évora; 59 *círculos judiciais* (2 in the Autonomous Regions of Madeira and the Azores); 217 district courts (7 in the Autonomous Regions of Madeira and the Azores). This diploma called attention to the need for deeper reforms, an idea that was reinforced in the *troika's* Memorandum. Following this, at present, the judiciary is governed by the Law of the Judiciary Organization (Law No. 62/2013, of 26 August) and the Regime Applicable to the Organization and Functioning of the Judicial Courts (Decree-Law No. 49/2014, of 27 March). These changes have the following aims: (i) extend the territorial basis of the judicial districts, making them more connected to the regional urban centres and population movements; (ii) establish specialised courts at a national level, not just concentrated in the metropolitan areas of Lisbon and Porto; (iii) implement a new model for the management of district courts. Regarding the second point, there already was considerable provision for the *Family and Minors* and *Labour* specialities in the national territory before the reform of the judicial map, and so the current reform only brought about greater spatial coverage for the *Penal* and *Civil* specialities.

From the territorial point of view and regarding their proximity to citizens, most of the courts remained but the justice system became organised around 23 district courts (one for each former district capital, with the exception of Lisbon and Porto, with three and two district courts, respectively. Fourteen districts had specialised resources at all levels). Therefore, out of the previously existing courts, 20 were closed (they handled less than 20 cases a year), 264 were converted into 218 central chambers and 290 local chambers) and 27 became *secções de*

proximidade (literally proximity chambers), 9 of which operate under special regimes. There was a focus on specialisation, with the specialised sections increasing from 233 to 390. The central chambers, with jurisdiction in their district, are divided into *civil chambers* (handling and judging lawsuits worth more than €50,000.00) and *criminal chambers* (preparation and trial of cases provided for in law within the jurisdiction of a collective court (involving more than one judge or jury) and chambers with *specialised jurisdiction* (e.g., criminal investigation, enforcement, labour, trade and family and minors). Local courts of first instance have the mission to handle and try legal actions not attributed to the central court of first instance and these include generic jurisdiction chambers, which may concern civil, criminal, petty crimes and “proximity” chambers, as well as extended territorial jurisdiction courts.

The justices of the peace courts, extrajudicial courts with jurisdiction to resolve common civil lawsuits up to €15,000 (excluding family, inheritance and labour law) were created in 2001 (Law No. 78/2001, of 13 July). In January 2016 there were 24 justice of the peace courts in mainland Portugal, 14 municipal and 10 groupings of municipalities.

Table 5 highlights the increase in the number of courts between 2001 and 2008, which underwent a slight reduction with the reform of 2008 and a marked change with the reform of 2013.

Table 5 – Evolution of the number of courts, by type

Courts	2001	2008	2009	2013	2014
	337	349	327	329	37
1st instance	332	343	321	323	31
General jurisdiction	197	196	181	181	-
Specialised/specific jurisdiction	135	147	140	142	-
District court	-	-	-	-	23
Widened jurisdiction	-	-	-	-	8
Higher	5	6	6	6	6

Source: INE, Statistics Portugal, <https://www.ine.pt>

Office services

Public administrative services have a varying typology, and services relating to Finances, Social Security and Registries and Notaries (*Instituto dos Registos e do Notariado* - IRN) will be analysed here. Between 2005 and 2011 these services registered some changes leading to a significant impact on the territorial reorganisation of their networks, and they were modernized making use of information and communication technologies (ICT). The crisis and subsequent need to rationalise resources accelerated the structural change of these services.

As regards the Tax Authority (AT) services, given the growing provision of public services on the Internet, the *troika's* memorandum proposed to rationalise its personal assistance network.

This measure sought: (i) to bring the finance services network in line with international standards and practices; (ii) to save financial resources through reducing costs on infrastructures and current expenditures; (iii) to reallocate human resources to activities generating greater added value. The 19th Government, as part of the *Aproximar* (Coming Closer) programme, carried out an assessment of its reorganisation, based on a composite indicator of productivity and homogenised production, which included variables related to assets, expenditures, earnings, tax justice and collection. Following this, although the possibility of closing tax offices was admitted, this did not actually take place. As such, almost all municipalities have at least one finances service and it is expected that this spatial distribution will remain, even in low-density areas.

As regards the physical provision of services relating to the Ministry of Solidarity, Employment and Social Security (*Ministério da Solidariedade, Emprego e Segurança Social* - MSESS), it has been rationalising its network through the setting up of joint services with the entities it governs [Social Security Institute (*Instituto da Segurança Social* - ISS); Institute of Financial Management of the Social Security Service (*Instituto de Gestão Financeira da Segurança Social* - IGFSS) and the Institute for Employment and Vocational Training (*Instituto do Emprego e Formação Profissional* - IEFP)]. This process, currently underway, was started with (i) the 2014 integration of ten IGFSS sections, in the district ISS head offices; (ii) the sharing of service spaces between the ISS and the IEFP; (iii) the use of municipal council spaces; (iv) the services offered by the '*Lojas do Cidadão*' (administration and services single points of contact). The setting up of a joint service network - which has required informatics systems interoperability between the various institutions - has enabled citizens to deal with services related to the ministry in charge of these in only one location. In the Guide for State Reform (Government of Portugal, 2014), the concerns are related only to the economic and financial sustainability of the institution.

One of the main changes which has taken place in the services currently forming part of the Institute for Registries and Notaries was the aforementioned privatisation of notarial activity. The public notary offices that remain function as autonomous services, or in an annexation regime with civil, land, commercial and auto-mobile registries. There are also nine Notary Offices with Specialised Competences, almost all of them located in former district capitals in the north and centre of the country.

Another important shift was the reorganisation of the registry networks initiated in 2011, focused on rationalising installation and operating costs, in optimising human resources and maximising use of the premises of the Ministry of Justice (MJ). This process is linked to a new form of services provision, in which services related to registries are concentrated in the same physical space rather than a fragmented operational logic. This integration has been facilitated by the incorporation of ICT, particularly front offices. At the end of 2013, there were 84 civil registries annexed to commercial and land registries, 46 land and commercial registries incorporated in civil registries, and 46 land/commercial registries integrated within civil registries. First and second land registry offices have also been joined together in Cascais, Sintra, Maia, Oeiras and Coimbra. These measures were implemented through support from protocols with the Agency for Administrative Modernisation (AMA), the AT (tax offices), the Institute for Financial Management and Justice Equipment (IGFEJ) and several town halls. The main aim of these partnerships is to provide facilities for the rehousing of registry services. This process continued in 2014, with the merger of civil, commercial and land registries in Lisbon and Porto and the

coming together of registries in second-generation '*Lojas do Cidadão*' in various parts of the country, which in certain cases also made specialised services available, such as Desks for Citizen Cards and for Portuguese e-Passports. In general, the main offices of each district have a civil registry, a land registry and a commercial registry with jurisdiction in the district council area. There can be more than one registry of the same type in the main office or parish offices with more than 30,000 residents, when the service volume in the same district so justifies. However, the more recent tendency is to annex different types of registries within the same district.

The '*Loja do Cidadão*' in Lisbon opened in 1999, providing a format which made a diversified set of public and private services available during extended opening hours. In its initial stage the concept was limited to the metropolitan areas of Lisbon and Porto, but in 2009, under the *Simplex* Programme (Presidency of the Council of Ministers, 2006), the "second-generation" model started operating and a year later there were 19 units (Tomé, 2013c). This expansion occurred in the district capitals in country areas and in small and medium-sized cities and coincided with an OECD recommendation (2008:17), according to which "(...) '*Lojas do Cidadão*' form an important framework model of user-centred 'one stop shops' [complemented by] a global strategy to provide multichannel services, with the provision of additional options for service delivery channels combined with transactional advanced administrative e-services." Their territorial spreading was justified by the need to provide "a greater integration of services based on life events [and] geographically and financially rationalize the public services distribution model, without losing their proximity to citizens along with savings on installation costs." (RCM No. 87/2008, of 27 May).

The Guide for State Reform (Government of Portugal, 2014) kept the policies in place for the '*Lojas do Cidadão*', particularly in terms of digitisation becoming the norm, as well as a focus on the provision of on-line *public services en masse*, assisted on-line help (taking advantage of partnerships between central public administration, town halls and civil society). The Strategy for the Reorganisation of Public Administration Desk Services (*Estratégia para a Reorganização dos Serviços de Atendimento da Administração Pública* - ERSAAP) provides more information on two policies currently taking place which are directly related to the '*Lojas do Cidadão*': a new management model for the '*Lojas do Cidadão*' and the creation of a complementary entity, the '*Espaço do Cidadão*' (literally the "Citizen Space"). The new management model for the '*Lojas do Cidadão*' is based on their management being contracted out to the municipality, rather than undertaken by central administration. There are already some '*Lojas do Cidadão*' operating in this way (e.g. those in Rio Maior and Santarém) and the pace of openings is expected to increase. At the end of 2015 there were 37 '*Lojas do Cidadão*' in operation. In the meanwhile, and in addition to this format, the '*Espaço do Cidadão*' is an idea based on a "single window" concept, digitally assisted, located in post offices, town halls and parish councils. It aims to ensure a minimal lower cost presence of the State throughout the national territory. Although it has a "minimum" format, it can help bring public services to citizens, and fight info-exclusion and promote social and territorial cohesion. According to ERSAAP, "This network will take advantage of the massive investment the State has made in the reorganization and digital provision of public services, reducing the current gap between the broad supply of these services and the low demand for them by citizens" (RCM No. 55-A/2014, of 15 September: 4964-58). The development of the Citizen Space Network is taking place in conjunction with local government and the private entities, fostering a shared management model adjusted to

the needs of each territory. The aforementioned document adds that “the territories of lower population density, where the supply of traditional public services is lower, will be the most privileged areas. By creating 1000 Citizen Spaces between 2014 and 2015, this complementary network to the LC network, will provide the country with a considerable network of public services points of delivery close to citizens.” However, at the end of 2015, according to figures released on the AMA website, there were still only 347 units operating in the country, providing around 170 different public entity services.

Regional case studies

Methodology

The demarcation of the regional case studies was based on the territorial dynamic modelling in mainland Portugal (2011), carried out by Tomé (2013a, 2013b and 2015). Thirty-six indicators and variables were considered, grouped into six themes: population; buildings and housing; economic system, territorial attractiveness and competitiveness; employment and living conditions; urban centralities; transport, accessibility and mobility. The analysis of this geographical information resulted in a typology in urban, rural and transition areas, with the former having most of the public services (education, health, justice and administrative) analysed (Table 6).

Table 6 – Public service facilities (no. and %), by service group and by territory type in Mainland Portugal

	Rural Territories		Rural-Urban Transition Territories		Urban Territories		Total	
	No.	%	No.	%	No.	%	No.	%
Education	193	3.4	876	15.4	4636	81.2	5705	100.0
Health	281	7.6	637	17.3	2771	75.1	3689	100.0
Administrative	70	3.8	417	22.4	1378	73.9	1865	100.0
Justice	7	2.3	63	20.3	240	77.4	310	100.0

Source: Tomé (2015)

Starting from that typology, three regional case studies (CS) were selected, involving sixteen municipalities:

- CS1: this corresponds to *metropolitan/densely urbanised territories*; it includes Lisbon and five municipalities of the Setúbal peninsula (Almada, Palmela, Seixal, Sesimbra and Setúbal);
- CS2: *urban-rural axis*; it includes six municipalities of Alentejo (Beja, Cuba, Vidigueira, Viana do Alentejo, Portel and Évora);

- CS3: *rural areas*; it includes the four border municipalities of the Baixo Alentejo (Barrancos, Moura, Serpa and Mértola).

In the CS1, Lisbon, the capital of the country, has a structuring role in the national urban system, polarizing it demographically and economically, and concentrating facilities and services, especially those at a higher hierarchical level. On the south side of the Tagus river, Almada and Setúbal are the municipalities with the largest populations, specialized facilities and services, with the former benefiting from greater proximity to Lisbon and the latter from the importance of its port and industrial activity. The central area of the Setúbal Peninsula includes urban areas of low/medium density (Fernão Ferro/Quinta do Conde/Azeitão), some of illegal origin, shared by the municipalities of Seixal, Palmela, Setúbal and Sesimbra. Its function as a “dormitory” area has been reinforced with recent improvements in road and railway networks.

In CS2, the cities of Évora and Beja dominate the organization of the regional urban system, with the former ever closer to Lisbon and subject to its influence. Improvement in accessibility between Évora and Beja seems to have made this city more vulnerable, with the loss of some services to the other. The remaining municipalities are more rural in character, but enjoy proximity to those two urban centres and the axis that connects them.

CS3 is a border area with Spain, which has had negative social and demographic dynamics for decades. The public services available within it are scarce and not very specialised.

To understand the way people use the various public services in those territories, an on-line survey was carried out between March and May 2015. This was intended to: (i) describe the use of different public services in the last two years; (ii) become aware of the location of the establishments used, the associated travel times (main residence - establishment), the service formats (if applicable) and the reasons for their choice (if applicable); (iii) identify the services and activities where there is complementarity between the public and private sectors; (iv) determine the degree of satisfaction with the different public services; (v) assess expectations regarding the need to use the services in the following three years.

In order to define the sample, the starting point was established as carrying out 810 surveys, which corresponded to a $\pm 3.44\%$ margin of error for a 95% confidence interval. The questionnaire, previously tested, was sent by email and through social networks (Facebook and LinkedIn) and also distributed by professors of the New University of Lisbon and the Polytechnic Institute of Beja, which disseminated it in the study areas. The 16 municipalities making up the 3 case studies were classified into 5 categories, in accord with their population levels, and a minimum number of surveys per municipality was established in accordance with their category: A (Lisbon) – 250 surveys; B (Almada, Seixal and Setúbal) – 60 surveys; C (Palmela, Sesimbra, Évora, Beja) – 50 surveys; D (Moura, Serpa) – 30 surveys and E (Portel, Viana do Alentejo, Cuba, Vidigueira, Mértola and Barrancos) – 20 surveys. According to these criteria, the envisaged 810 surveys were divided as follows: 530 in the CS1, 180 in the CS2 and 100 in CS3. The number of responses obtained was much higher, enabling a more rigorous selection process for its validation, with it being possible to consider variables such as the age structure and the rural/urban nature of the parish of residence, in order to minimize any resulting bias for the preferred distribution of e-surveys. Out of all the surveys received, 173 were eliminated, and 951 validated: 627 in the CS1, 224 in the CS2 and 100 in the CS3. The maximum error margin is thus $\pm 3.17\%$ for a 95% confidence interval.

Main results

Table 7 shows the number of service units per groups and case studies. Education and health services stand out, given the variety of available types necessary to ensure implementation of comprehensive coverage policies (national health service and compulsory schooling from pre-school centres to secondary education).

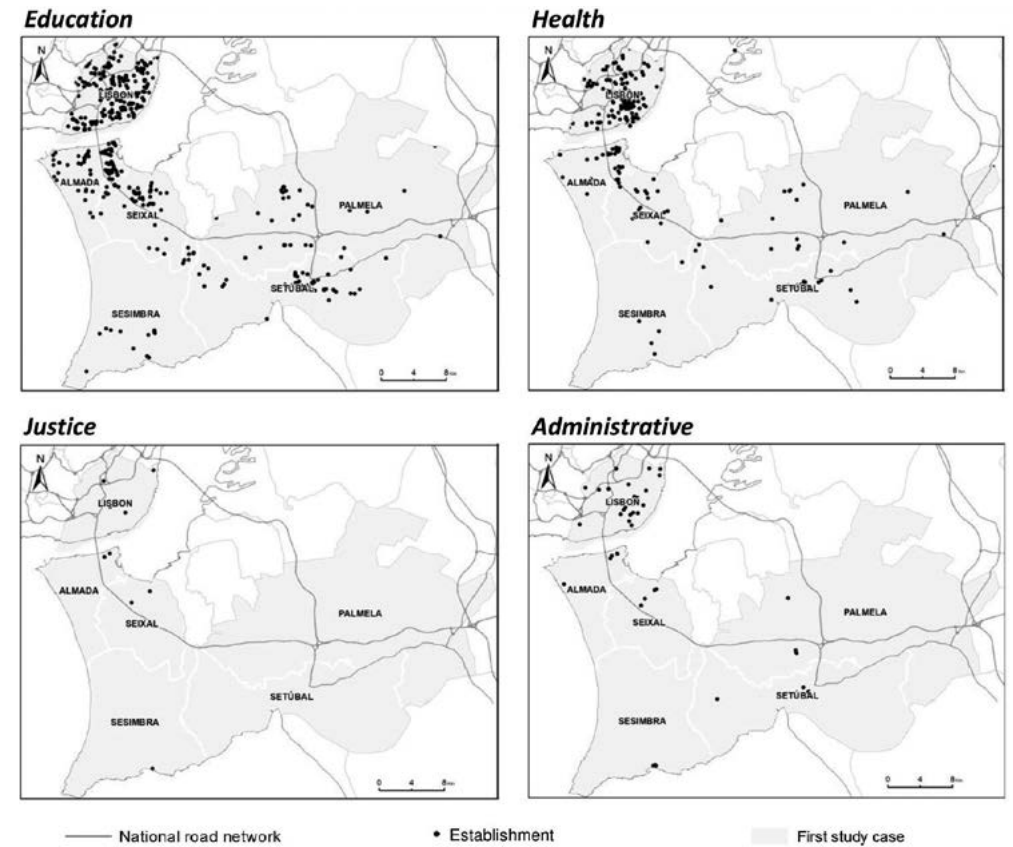
Table 7 – Public services, by service groups and by case study (2015)

	CS1	CS2	CS3
	No.	No.	No.
Education	408	79	43
Pre-school Centres	42	16	10
Primary Schools	274	52	29
Primary and Secondary Schools	12	1	1
Secondary Schools	37	5	2
Vocational and Artistic Schools	6	0	1
Higher Educational Institutions	37	5	0
Health	446	71	26
Primary Care	86	51	18
Hospital Care	9	4	7
Long-term Integrated Care	30	2	1
Contracted Services	321	14	0
Administrative			
AT	71	39	23
ISS	24	6	3
IRN – Civil	10	9	4
IRN – Land	6	6	4
IRN – Commercial	8	5	4
IRN – Vehicles	8	6	4
Multi-purpose Administrative	10	7	3
Services Centres (Lojas do Cidadão)	5	0	1
Justice	35	10	3
Courts	32	10	3
Justices of the Peace	3	0	0

Source: Tomé (2015: 454-459)

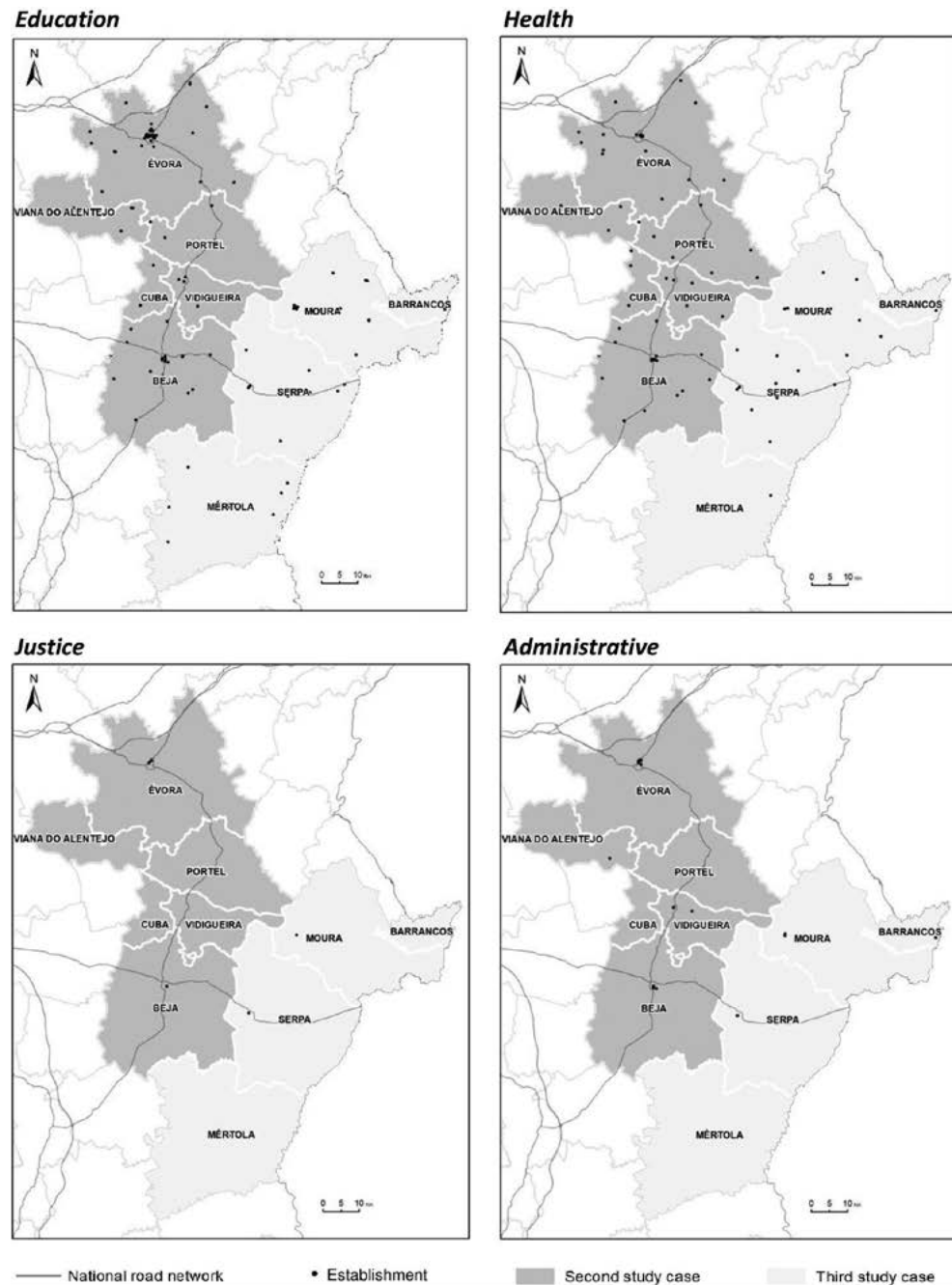
Figures 3 and 4 show the spatial distribution of public services, showing concentrations in accordance with the settlement structure.

Figure 3 – Location of public services, by type, in CS1 (2015)



Source: Adapted from Tomé (2015)

Figure 4 – Location of public services, by type, in CS2 and CS3 (2015)



Source: Adapted from Tomé (2015)

Use of Public Services

The use of public services is similar in the three case studies: health services are most in demand by the populations, followed by public services related to administration, education and, lastly, justice (Table 8).

Table 8 – Respondents whose household members have used public services in the last two years

Public services	Respondents (Number and % of total respondents)					
	CS1		CS2		CS3	
	No.	%	No.	%	No.	%
Health	551	87.9	212	94.6	96	96.0
Administrative	551	87.9	204	91.1	94	94.0
Education	281	44.8	119	53.1	53	53.0
Justice	77	12.3	29	12.9	10	10.0

Source: Tomé (2015)

However, there are differences in each service based on its nature, frequency of use and complementarity of the public offer with the private sector.

In education, in the three case studies, most students attend basic education (1st, 2nd and 3rd education cycles - years 1 to 9) or higher education. The complementarity with the private services is highest in the CS1 (32.2%) and lowest in the CS3 (10.9%), which is associated with smaller private offer in the rural territories and the lower financial resources of households. The private sector involvement in educational services are mainly free time activities, school support and sports activities.

In health, proximity services are used by the largest number of respondents, although with a reduced frequency (2 to 3 times a year). Regional services are also in demand, by around 80% of the respondents, while specialised health services are the least used (22.9% to 34.4%). However, in both cases, use is rare (once a year). The largest usage rates occur in rural territories. In the public services analysed, the greatest complementarity with the private offer is in the area of health – metropolitan/densely urbanised territories (75.9%), urban-rural axis (63.2%) and rural territories (53.1%) – mainly for medical specialisation appointments. The choice of the private sector to obtain health care is, to a large extent, related to the existence of agreements with health subsystems, the speed in making appointments and subsequent care, the quality of the service and the quality/price ratio.

The justice services are hardly used by the respondents: 16.0% in the CS3; 21.9% in CS1; and 23.2% in the CS2. Among the courts most used, the most sought-after specialisations are civil, administrative, criminal, family and minors and labour. The scarce use of justices of the peace is connected with their smaller territorial presence outside the large urban centres, but also a lack of knowledge of this service by the population groups.

As regards administrative services, finance is the most sought-after and registry and notary services the least requested. Frequency of use varies between services, but there are clear differences between the three types of territories. In general, finance services are used 2 to 3 times a year, while social security, and registry and notary services are rarely used (once a year). In the service formats most sought-after there are different territorial trends: on-line portals and *Lojas do Cidadão* are accessed most in metropolitan/densely urbanised territories; specialised departments are used more in transition territories, which also show modest use of *Lojas do Cidadão* and *Espaços do Cidadão*; specialised departments also dominate rural territories, but there the *Lojas do Cidadão* and the *Espaços do Cidadão* have had relative success. Contrary to what happens in the other public services analysed, in the CS3 there is greater use of specialized/intermediary private agencies (9.6%).

Location and distance-time to the service

In education public services, it was seen in the three case studies that for preschool and primary education, most respondents use ones in their municipality and parish of residence. However, in general the ratio of the “in the municipality” and the “in the parish of residence” answer and the other options tends to decrease in proportion to the level of education. As regards higher education, the differences between the analysed territories are obvious, related to the availability of supply: in CS1 most respondents use institutions located in the municipality of residence but in another parish; in the other case studies the most representative answer is in another municipality (other than the municipality of residence and work). The distance-time between the usual place of residence and the teaching establishment varies, in most levels of education and in the different case studies, from less than 5 minutes to between 6 and 15 minutes. Only in higher education is the distance-time greater to these values in the CS1 (between 16 and 30 minutes) and in the CS3 (more than 60 minutes).

In health, proximity services are located mainly in the municipality and the parish of residence, regional services are in the municipality of residence but in another parish and specialized services in another district, unlike the municipality of residence and study/work. Health services are generally little used in the municipalities where individuals work or study. These locations are reflected in the distance-time from the place of residence to the closest health facility: for proximity services these are almost always between 6 and 15 minutes, although the number of responses “less than 5 minutes” is similar; in the metropolitan/densely urbanised territories, the regional services are between 16 to 30 minutes, in the urban-rural axis they are between 6 to 15 minutes and in the rural areas between 31 and 60 minutes; and for the specialised services these are between 31 and 60 minutes of the population (CS1) and over 60 minutes (CS2 and CS3).

Respondents showed that administrative public services, regardless of their type, have similar territorial patterns: in the CS1 and CS2, the three services analysed are available in the municipality of residence but in another parish (only social security in the CS2 is more represented in the municipality and in the parish of residence); and in CS3, all services are obtained by most users in the municipality and parish of residence.

The most mentioned location for justice services in all territorial contexts is the municipality of residence but in another parish. Among the public services analysed, those of justice - and, in particular, the courts - are those where there is a greater use in other municipalities than those of residence or for study/work, justified, to a large extent, by the territorial deployment of the courts and by specific legislation, which establishes the access criteria based on place of residence. In terms of time, it is in the Évora-Beja axis that the courts are more accessible (between 6 to 15 minutes). In the metropolitan/densely urbanised territories, distance-times of 16 to 30 minutes are dominant in the access to courts and to the justices of the peace and over 60 minutes in the rural territories.

Expectations of use in three years

By 2018, most respondents admitted they will use education services: 56.0% in urban areas, 69.6% in the urban-rural axis and 59.0% in rural areas. As for health, almost all (99%) expect to make use of public services. In both services, the public sector will continue to stand out in the provision to their respective populations, above all in the CS2, which is justified by the lack of private offer and lower purchasing power of its residents. Regarding the way in which the services should be provided, the respondents show preference for face-to-face service, possibly supplemented by telephone or on-line assistance for education and health.

As regards administrative public services, the overwhelming majority of the respondents expect to use services exclusively in the public sector, through on-line portals but, if necessary, resorting to face-to-face service for specific issues.

In the public justice services, due to this being difficult to predict, most respondents do not know whether they will use them or not, but, if they do, this will be face-to-face.

Reorganisation of public service networks from the individual and territorial perspectives

The respondents were also questioned about the impact of the reorganisation of networks in both individual and municipal terms. In all case studies, the majority showed difficulty in carrying out this assessment, mainly in the metropolitan territories. In these, the polycentric structure and high accessibility and mobility make it more difficult to understand geographical patterns and the difference between public and private offers. In the urban-rural axis and in rural areas, this perception is clearer, given the greater knowledge of the territory of residence and lower possibilities of choice due to lack (or absence) of supply. Those who express an opinion on this matter differentiate impacts from individual and territorial perspectives: in urban territories what is most emphasised is the harm to the individual, in contrast to rural areas, where the stronger sense of territorial identity gives rise to greater concern for the community.

To sum up, the results confirm that in urban territories the greater number and diversity of services reinforce the proximity effect and broaden the choices of users. On the contrary, in other areas, and more sharply in rural areas, the shortage of supply and the greater distances to travel to access services penalises their use. This condition is aggravated by the profile of the

residents, who tend to be more elderly and dependent on public transport, which is scarce. Thus, it is vital to find alternative forms of access to services in these areas, particularly concerning flexibility of opening and operational criteria (schools, health centres), and the provision of electronically supported fixed and/or itinerant multi-service formats (e.g. in the parish council).

Reflection from the perspective of territorial resilience and cohesion

Over the past 40 years, the network of public services in Portugal has undergone marked changes. With a democratic regime, a Welfare State was set up, supported by essential redistributive policies to bring the country out of its structural backwardness in development and reduce territorial inequalities.

Following the initial political instability, the decade that preceded Portugal joining the European Economic Community (EEC) saw the launching of policies with a strong social impact (education, health, social security, justice), which started to alleviate the widespread under-resourcing, but also contributed to aggravating national public accounts.

After joining the EEC (1986), the availability of structural funds through successive Community Support Frameworks provided infrastructure and facilities to the country, with ever greater and more diverse networks. This generalised coverage of territories, guided by the principles of equality and universality of access to services, thus contributed to reinforcing territorial cohesion. However, at the same time this led to a lack of investment in traditional sectors such as agriculture, fishing and industry, contributing to the weakening of the productive base of the country, making it more dependent on the outside. Strong public investment generated societal changes, with repercussions in the territories, reinforcing littoralization, dispersal in the occupation of densely urbanised areas, the emptying of city centres, and the widening of low-density territories. The different rhythms in the design/application of policies and territorial dynamics (induced, or not, by these) generated imbalances, and even contradictory effects, between the responses which were implemented (and which became prematurely obsolete) and the emergence of new needs (the response to which has not been immediate).

However, a sequencing and combination of exogenous and endogenous events has contributed to a significant change from the previous framework, sharpening the existing contradictions. As regards the external aspect, the demand resulting from Portugal being included in the Eurozone (2001), the consequences of the enlargement of the EU to the east (2004) and the effects in Europe, particularly in southern countries, of the American financial crisis (2008) affected the capacity for public and private (external and internal) investment in the country. As regards the internal component, the first signs of crisis showed the difficulty of bearing the costs of operating and maintaining infrastructures for and networks of facilities (without EU support). At the same time, the crisis accentuated imbalances in that model of creating infrastructure with regard to socio-demographic developments, already previously perceptible but neglected. These, by themselves, justified reorganisations of the networks, seeking to introduce greater rationality in their operation, which could be seen in some cases, without taking into consideration specific local aspects (e.g. closure of primary schools with a number of students less than a pre-established limit, which has been increasing). In fulfilling the

troika's Memorandum, focused on public expenditure reduction and its deficit, the neoliberal Government went against the dominant thinking in Europe marked by public disinvestment in services of general interest, paving the way to the extinction, contracting, subjection to a free competition framework and the privatisation of public services.

The principle of equity, which requires the availability of infrastructure and public facilities as well as universal access to services of general interest, was passed over for criteria of (presumed) efficiency. The spatial and functional concentration of these services has resulted in difficulties in adjusting to demand needs and preferences. In low-density areas spatial equity in access to public services, when considering the distance to the points of delivery and of choice, has been penalised, especially taking into account the spread of the population, the accentuated ageing of the population and their decreased mobility. The territories are more vulnerable and territorial cohesion has been compromised.

To summarise, there was a period of euphoria, with an excess of voluntarism for public policies, stimulated by Structural Funds, which also led to perverse effects, which have perhaps been underestimated (especially the over-sizing of equipment and inadequate spatial distribution), which reached a critical period, marked by the difficulty of public authorities in supporting the operational and maintenance costs of the previous model. The crisis has aggravated these negative effects, which have penalised territories, thus making them more vulnerable.

References

Alves, T. (2005a). *Geografia dos serviços: reestruturação produtiva e inovação social*. Centro de Estudos Geográficos. Lisboa.

Alves, T. (2005b). The decentralization of the public administration in Portugal information society and the development of services in rural areas. in Alves, T. (coord.). *Serviços e desenvolvimento – que oportunidades para as áreas rurais?*. Centro de Estudos Geográficos. Lisboa.103-118.

Baum, C. and Maio, A. (2000). *Gartner's four phases of e-government model*. Gartner Group.

Bent, S., Kernaghan, K. e Marson, D. B. (1999). *Innovations and good practices in single-window service*. Institute of Public Administration of Canada. Toronto.

Capucha, L., Duarte, A. and Estevão, P. (2013). Políticas de educação em Portugal. in Rodrigues, M. L. and Adão e Silva, P. (orgs.). *Políticas públicas para a reforma do Estado*. Almedina. Lisboa. 279-294.

Carmo, R.M. and Barata, A. (2014). Introdução: o Estado Social não é gordura, é músculo. in Carmo, R.M. and Barata, A. (org.) (2014). *Welfare State: De Todos Para Todos*. Tinta-da-china. Lisboa. 9-21.

Chauvière, M. (2001). Déconstruire la rhétorique et la proximité. in CORUM (ed.) (2001). *La proximité, quels enjeux pour les services publics?*. Mario Mella Edition. Lion. 121-129.

Comissão Europeia (2004). *Livro Branco sobre os serviços de interesse geral*. Edição própria. Bruxelas.

Comissão Europeia (2008). *Livro Verde Sobre a Coesão Territorial Europeia, COM(2008) 616 final, Bruxelas* http://ec.europa.eu/regional_policy/consultation/terco/paper_terco_pt.pdf

CORUM (ed.) (2001). *La proximité, quels enjeux pour les services publics?*. Mario Mella Edition. Lion.

Coutinho, M. (2000). Administração pública voltada para o cidadão: quadro teórico-conceitual. *Revista do Serviço Público*. n. ° 3: 40-72.

Crisóstomo, S. (2013). O sistema nacional de saúde em Portugal. in Rodrigues, M. L. and Adão e Silva, P. (orgs.). *Políticas públicas para a reforma do Estado*. Almedina. Lisboa. 261-277.

Ferrão, J. (2000). Relações entre mundo rural e mundo urbano - Evolução histórica, situação actual e pistas para o futuro. *Sociologia, Problemas e Práticas*. 33: 45 -54.

Ferrão, J. (2013).Território. in Cardoso, J. L., Magalhães, P. and Pais, J. M. (org.). *Portugal Social de A Z. Temas em Aberto*. Expresso. Lisboa. 244-257.

Governo de Portugal (2005). *Plano Tecnológico - Uma estratégia de crescimento com base no Conhecimento, Tecnologia e Inovação*. Edição própria. Lisboa.

Governo de Portugal (2014). *Um Estado Melhor*. Edição própria. Lisboa.

Hartley, J. (2005). Innovation in governance and public services: past and present. *Public Money & Management*. vol. 25: 27-34.

Harvey, D. (1973). *Social Justice and the City*. Blackwell. Oxford.

Hespanha, P., Ferreira, S., Pacheco, V. (2013). O Estado Social, crise e reformas. In CES/OCA, *A Anatomia da Crise: Identificar os problemas para construir as alternativas*. 1º Relatório Preliminar do Observatório sobre Crises e Alternativas. CES/OCA. Coimbra. 161-249.

INE (2003). *XIV Recenseamento Geral da População/IV Recenseamento Geral da Habitação – Dados comparativos 1991-2001* (CD-ROM), Edição própria. Lisboa.

Marques, M. (2009). *Serviço público, que futuro?*. Almedina. Coimbra.

Marques, T. S. (2004). *Portugal na transição do século – retratos e dinâmicas territoriais*. Edições Afrontamento. Lisboa.

Martin, R. (2012). Regional economic resilience, hysteresis and recessionary shocks. *Journal of Economic Geography*. vol. 12: 1-32.

OCED (2008). *Rethinking e-Government Services User-Centred Approaches*. OCED. Paris.

OECD (2011). *Assessing and monitoring rural-urban linkages in functional regions: A methodological framework*. OCED. Paris.

OCED (2013). *Portugal: reforming the state to promote growth*. OCED. Paris.

Pereira, M. (2009). Desafios contemporâneos do ordenamento do território: para uma governabilidade inteligente do(s) território(s), *Prospectiva e Planeamento*. vol. 16: 77-102.

Presidência do Conselho de Ministros (2006). *Simplex'06 – Programa*. Edição própria. Lisboa.

Rivas, D. (2012). Explorando algunas trayectorias recientes de la justicia en la geografía humana contemporánea: de la justicia territorial a las justicias espaciales. *Cuadernos de Geografía, Revista Colombiana de Geografía*. 21: 75-84.

Teigão dos Santos, F. (2009). Territórios resilientes enquanto orientação de planeamento, *Prospectiva e Planeamento*. vol. 20: 13-28.

Tinholt, D. (coord.) (2013). *Public services online 'Digital by default or by detour?' – Assessing user centric eGovernment performance in Europe – eGovernment benchmark 2012*, Bruxelas, Comissão Europeia

Tomé, R. (2011). *Comércio e serviços em áreas urbanas de génese ilegal – o caso da Quinta do Conde*. Universidade Nova de Lisboa. Lisbon (Master's dissertation).

Tomé, R. (2013a). Lojas do Cidadão: do formato do centro comercial de serviços aos pontos de atendimento integrados. Que perspectivas de evolução? in APG, *IX Congresso da Geografia Portuguesa*. Edição própria. Évora. 601-606.

Tomé, R. (2013b). Podem os Sistemas Complexos Adaptativos ajudar a geografia a compreender a evolução da oferta e procura dos serviços públicos e das políticas e estratégias territoriais que lhe são inerentes? in APG, *IX Congresso da Geografia Portuguesa*. Edição própria. Lisboa. 880-887.

Tomé, R. (2013c). Lojas do Cidadão: do formato do centro comercial de serviços aos pontos de atendimento integrados. Que perspectivas de evolução? in APG (org.), *IX Congresso da Geografia Portuguesa*. Évora. 606-611. ISBN 978-972-99436-6-9.

Tomé, R. (2015). *Serviços públicos em diferentes contextos territoriais: (re)organização das redes e relações com os sistemas urbanos*. Ph.D. Thesis. FCSH, UNL, Lisboa.

Cooperation or Firm-Based Innovation? Evidence from the Portuguese Economy

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Introduction

In today's knowledge-intensive economies, the enterprises can have a strong economic and social influence. Facing today's economic instability they ought to provide a constant stream of innovations to clients. Then, they often need external expert knowledge in order to cope with current trends and achieve business success. Firms are able to create a steady demand for their products/services if they constantly readjust their strategies. Researchers suggest that firms can reshape the market through their innovations, for which can contribute some external sources. Economic success is determined by enterprises' ability to offer solutions to changing needs, trends and structures. More enterprises acknowledge that change is not only important, but also compulsory due to the fact that they constantly face a fast changing market. Innovation can be achieved in a variety of elements such as products, services, operations and processes depending on the enterprise's resources, capabilities, requirements and strategies.

The process of developing an innovation may imply three types of approach: make; buy or cooperate with other agents to acquire specific competences or knowledge. The last occurs when the firms' internal knowledge or skill-base is not sufficient or effective and is conveniently complemented with external sources. Several studies on innovation support that firm's boundaries require porosity in order to absorb knowledge and capabilities from the external environment. This can provide an extensive variety of ideas, opportunities, sharing of costs and resources. Clients constantly demand new services, according to their exposure to external information and trends (even through the internet - social networks, virtual worlds, etc.). Therefore firms need to correspond to their expectations and satisfy their needs. A work about this issue, based on a sample of 70 firms in Algarve (Belo et al., 2016), shows that firms are already using social networks for customer knowledge acquisition and not only for advertising purpose.

Firms' cooperation, among them or with clients or other stakeholders, and its potential for innovation is not new. The literature confirms that firms that do not co-operate, and do not formally or informally exchange knowledge, limit their long-term knowledge-base and, ultimately, reduce their ability to enter into exchange relationships (Hanna & Walsh, 2008; Pittaway et al., 2004). More specifically, regarding product and process innovation, positive

associations were found in cooperation with customers, suppliers, the public sector and universities (Freel & Harrison, 2006).

In this work our aim is to identify the sectors of the Portuguese economy that most engage in cooperation to develop innovation and which sources and/or agents are most used, by sector and type of innovation (with incidence in product and process innovation). To attain these goals, it is structured as follows: next section makes a literature review on the assets and agents of cooperation for innovation; third section describes the research framework (instrument, sampling and frequencies) for appraising the nature of the innovation process in terms of cooperation or firm-based innovation by type of innovation (product/process); then fourth section differentiates these results by sector outlining which cooperation sources/agents are most used (scope) and relative intensity (scale); finally fifth section concludes and refers future directions of research.

Literature review

Today it is more difficult for enterprises to maintain a competitive advantage only through internal R&D (research and development), due to technology or market discontinuities caused by knowledge-base and business changes. Given the dynamism and complexity of this environment, enterprises need to complement their internal resources and capabilities with ideas from outside, interacting with a wide range of actors. This contribution to internal R&D can give enterprises access to complementary assets, needed to turn an idea into a successful product or service. Thus, many firms seek external partners and knowledge in order to compete in this dynamic and fast changing context. Regarding these issues, it is interesting to analyze if Portuguese firms complement their internal R&D with external sources, and which ones according to their sector of activity.

Innovation and its assets

Innovation and its external vs. internal assets are the main subject of this research, i.e. cooperation vs. firm-based innovation and sectorial patterns. Innovation is a theme of interest for researchers in different business and management disciplines such as strategy, information technology, marketing, entrepreneurship or even engineering and product design. A definition of innovation common to all of these areas is not easy. As Damanpour and Schneider (2006) state that innovation is studied in many disciplines and has been defined from different perspectives. For instance, Baregheh et al. (2009) collected 60 definitions of innovation from the various disciplinary literatures in their study. Addressing this ambiguity, these authors proposed a definition for summarizing the meaning of innovation: "Innovation is the multi-stage process whereby organizations transform ideas into new/ improved products, services or processes in order to advance, compete and differentiate themselves successfully in their marketplace" (Baregheh et al., 2009: 1334).

It is important to mention that it can only be considered an innovation when the enterprise develops an invention that is introduced in the market and is commercialized bringing economic

return to the firm (Kuznets, 1962). Innovation can be achieved in a variety of elements depending on the enterprise's resources, capabilities, requirements and strategies. The most common types of innovation refer to products, materials, services or organizational structures (Ettlie & Reza, 1992). The dataset used in this work is provided by the Community Innovation Survey (CIS) 2010-12, which collects information on four major types: product/service, process, organizational, and marketing innovation. In this research, we focused on the first two main types: product/service and process innovations.

Other authors have already focused on different sources and types of innovation: Pavitt et al. (1987), Lundvall (1988), Cornish (1997). For instance, Propris (2002) concentrated her investigation on the impact of inter-firm co-operation over innovation on four different dimensions of innovation: product, process, incremental and radical innovation.

Theoretical background of innovation

Since the 1980s, firms should reassess their innovation strategies due to the increasing volatility of the competitive environment with shorter product and technological life cycles (Nijssen et al., 2001). New products and services had to be faster developed (Chatterji, 1996). Organizations strive to gain competitive advantage and consequently they adopt innovations to enhance their organizational performance (Hernandez et al., 2008). Already in 1925, Marshall recognized that the firms' internal knowledge base should be conveniently complemented with external sources. Since the mid-1990s, in order to exploit new opportunities, achieve economies of scale or market strength, multinational firms as well as small and medium-sized firms have been establishing more relationships with other companies (Rosenfeld, 1996; Hagedoorn et al., 2000). Today, given the dynamism and complexity of modern society it is essential to complement the enterprises' internal knowledge with external expertise. Even major organizations, attentive in terms of innovation, cannot depend exclusively on internal sourcing, requiring knowledge beyond their boundaries (Rigby & Zook, 2002). Freeman (1991) stated that firms with R&D departments have a propensity to employ external knowledge sources intensively. Several theorists point out that the introduction of new products and processes into the market rely on the firm's skills to build strong relations with external agents meaning that firms seldom innovate on their own.

It is now widely acknowledged that firms' innovation patterns depend on the sources employed and that they are specific to each industry (Archibugi et al., 1991; Evangelista, 1996). External sources are of extreme significance to small and medium-sized firms particularly those belonging to knowledge-intensive sectors (Smith, 1993; Malecki & Tootle, 1996; Rothwell, 1992; Shapira et al., 1995).

Open innovation

In the process of developing new products/services it becomes essential to perceive the significance wielded by external agents as a source for successful innovation projects. In present

economies firms cannot rely solely on their own R&D; they need to balance internal sources and capabilities with ideas from outside and interact with a large number of players (Lundvall, 2010; Szulanski, 1996; Laursen & Salter, 2006). This is the main strength of the open innovation model (Chesbrough, 2003a, b). Open innovation is defined as: "...the use of purposive inflows and outflows of knowledge to accelerate internal innovation and expand the market for external use of innovation, respectively" (Chesbrough et al., 2006: 2).

In the open innovation model, the firm's business model is tailored in privilege of R&D activities, and the technological change takes place outside the firm. As a consequence, innovation becomes progressively more spread among the various partners. Then new ideas and knowledge for product innovations can result from collaboration with external partners (Lambe & Spekman, 1997). On the one hand, external knowledge connections are a vital factor in the open innovation model, and on the other a complement to internal research (Cohen and Levinthal, 1990; Veugelers, 1997; Chesbrough et al., 2006). Following this approach, firms that are internally centered need to open their boundaries to external partners, otherwise numerous opportunities may be missed (Chesbrough, 2003a; Laursen & Salter, 2006). Several studies support that firm's boundary requires porosity in order to absorb knowledge and capabilities from the external environment (Chesbrough, 2003b; Shan et al., 1994; Leonard-barton, 1995; Powell et al., 1996). This can provide an extensive variety of novel ideas and innovation opportunities (Laursen & Salter, 2006; Powell et al., 1996) and access to complementary resources to turn an innovation into a market success. The use of external knowledge is a vital element of innovative performance (Cohen & Levinthal, 1990).

Cooperation for innovation

In most countries, the economic environment where business takes place is defined by complexity and dynamism. Fast changing factors such as technology, customers or competitors force enterprises to renew their strategy in order to survive, reshaping their activities, in particular innovation development. The process of developing an innovation normally implies two types of strategy: generate knowledge in-house (make) or purchase it (buy) (Veugelers & Cassiman, 1999). Nevertheless, in recent times theorists have detected a third strategy for acquiring knowledge - cooperation with other agents (Navarro, 2002).

Strategy specialists have demonstrated that agents from outside the enterprise constitute a significant resource in modern competitive context, especially in the development of new products and processes (Peteraf, 1993). The enterprise's intention to cooperate with other agents in innovation activities is impelled by the fact that it is an efficient way to improve the chances of success of differential products or services (Becker & Dietz, 2004; Abramovsky et al., 2005, Sampson, 2007). Besides, enterprises that are highly internally focused, not opening themselves to external networks and relationships, may miss a lot of interesting combinations (Chesbrough, 2003a; Laursen & Salter, 2006). Thus, in innovation the decision to cooperate with other agents is important since it will enhance the enterprise's learning capabilities.

However, literature states that enterprises' performance depends on their ability to locate, absorb and exploit those sources in a productive way (Cohen & Levinthal, 1990). Several other

factors support the firm's decision to cooperate: e.g., share expenses and uncertainty, exploit synergies, recognize economies of scale/scope, as well as benefit from government support (Veugelers & Cassiman, 1999; Becker & Dietz, 2004). Given these advantages from cooperation, if innovation has been introduced in an industry, no cooperation will be acknowledged as a competitive disadvantage (Enkel et al., 2009). The innovation process may involve external sources from different origins, ranging from clients, suppliers, universities to competitors, among other agents (Von Hippel, 2005; Powell et al., 1996).

Essentially, innovation sources are divided in two types: internal and external. Table 1 shows these sources in detail. The internal type relates to the innovation activities carried out within the enterprise: R&D, marketing and production departments. The external type is related to: (1) market sources such as customers and users, suppliers, competitors, consultants and experts, among other sources; (2) educational and research sources; and (3) public available information.

Table 1 – Innovation sources

Internal	External
R&D Department	(1) Market Customers and users Suppliers (materials, equipment, software, etc.) Competitors Consultants and experts Other (commercial laboratories or technological parks)
Marketing Department	(2) Educational/research Universities Research institutes
Production Department	(3) Public available information Conferences Fairs /Exhibitions Journals, Magazines Patents

Source: Own elaboration

It is clear that enterprises have at their disposal a wide range of agents to cooperate in their innovation effort. But decide on which one(s) to cooperate with depends on the ability to identify the type of agent that can better satisfy their internal needs and improve their competitive advantage.

Customers

Customers can be the cooperation agent with greatest impact on the intensity of innovation activities, somewhat because it is a vertical or non-competitive cooperation. Their involvement in the manufacturing and service sectors is a good example of their contribution in new product development (Sánchez-González & Herrera, 2014). The success of product innovations in public sector institutions is also highly related to cooperation with customers (Freel & Harrison, 2006). This external partner is an important source of knowledge because its inputs help firms to identify new ideas about products and solutions, understand customers' attitudes, and identify new market trends in advance. For example, high-tech industries benefit from customers contribution particularly to learn about technological trends and develop superior products (Brettel & Cleven, 2011). Some firms invite customers to participate in the innovation process, most frequently in the design of the next new product (e.g., the online Lego DesignbyMe tool). Regarding complex technologies and/or products, this external source provides particularly valuable information (Von Hippel, 2005; Tether, 2002). The similar principle applies when the product presents a high level of novelty (Amara & Landry, 2005). This can be explained by the fact that the user's experience can be of great help, either to reshape or improve the existing design or give ideas for new models and applications. Apart from improving the product design, collaboration with customers provide a more controlled development of the innovation process taking less time and lower costs (Jeppesen, 2002).

Suppliers

The relationship with suppliers is also considered as a vertical or non-competitive cooperation. It is a fact that enterprises have increased their relationships with their suppliers from the 1980s, mainly because of Japanese car and electronics successful relationship in developing innovations (Bidault et al., 1998). According to Håkansson and Eriksson (1993), suppliers are base factors of business. These players can be a source of innovative ideas and critical technologies considering that suppliers have specific knowledge and competencies.

In countries like the United Kingdom and United States, large enterprises that choose to downsize and concentrate on core competences, have increased their collaboration with these agents to guarantee a supply of quality inputs. The high degree of efficiency attained is one of the main reasons for cooperating with suppliers in terms of new products or processes (Tether 2002; Bayona et al. 2003; Santamaría & Rialp 2007). Suppliers are the partners of choice when the enterprise's objectives have a commercial nature, such as entering new markets or internationalization (Bayona et al. 2001, Santamaría & Rialp, 2007). These agents not only assist the development of products and processes, quality improvement and market adaptation, but also productivity and flexibility. Reduction of production costs is another reason to cooperate with suppliers, likewise costs and risks involved in new product development (Chung & Kim, 2003).

Competitors

Establishing a relationship with competitors is normally referred as horizontal cooperation. Competitors are an external source that can be involved in the innovation process (Von Hippel, 2005). The knowledge generated by these agents can easily be accessed and exploited by firms that do not hold a high level of internal technological competence (Cohen & Levinthal, 1990). This type of relationship is quite appealing, considering that it contributes to intensify international competitiveness in enterprises, industries and countries and to solve issues associated to market failures and technological deficiencies. Cooperation with competitors involves, on the one hand a reduction in investment risk and market uncertainty, and on the other sharing costs when enterprises initiate their R&D activities (Harabi, 2002). According to Von Hippel (2005), enterprises improve products and processes by learning from their competitors, through know-how exchange.

Nevertheless, there are risks associated with the possibility of competitive behaviour and spillover of key knowledge to competitors (Miotti & Sachwald, 2003). Therefore, cooperation is more likely to occur either in protected areas, or sharing knowledge that is not vital. Enterprises avoid areas that may raise competition and favour cooperation on solving common issues (Tether, 2002; Cassiman & Veugelers, 2002) such as collaborating on basic research/projects or establishing standards in the sector (Tether, 2002).

Consultants and experts

Enterprises tend to seek alternative sources of knowledge and information when the development of innovations is affected, in particular when it is not evolving as fast as needed or does not correspond to enterprise's expectations. Thus, consultants and experts are a suitable solution (Tether, 2002). These agents are a source of specialized knowledge and skills that provide a wide range of valuable inputs for innovation development.

Consultants and experts render possible experience sharing, concerning the definition and articulation of specific innovation needs, offer ideas on new needs and solutions, or even allow idea transfer among enterprises (Bessant & Rush, 1995). Besides, these agents can bring to the enterprise different points of view as they are not familiar with its products and processes, since the enterprise staff can sometimes be an obstacle to new ideas. The contributions brought by this type of agents have encouraged a growth in the number of effective innovative ideas (Bruce & Morris, 1998).

Universities and research institutes

A common form of partnership is the cooperation with scientific agents, particularly in science-based firms (Castro & Fernández, 2006). Universities and research institutes have an important role in the development of technological innovations, contributing to new scientific and technological knowledge (Drejer & Jorgensen, 2005). This type of collaboration does not

bring any type of commercial risk, unlike cooperation with competitors, as it is focused on generating R&D knowledge of a basic or generic nature and not introducing it in the market (Miotti & Sachwald, 2003). Cooperation with universities is a way of sharing costs as it exploits knowledge which is publically available.

Universities, as well as their research institutes, are constantly creating and developing scientific knowledge. As research in firms intensifies it becomes very expensive, then specialized academic knowledge is brought to balance and complement the firm's R&D in order to gain access to rising technologies and achieve technological discovers that lead to distinctive commercial products (Spencer, 2003). Probably, one of the reasons why enterprises chose this source may be to benefit from public funds destined to research (Bayona et al., 2001; Cassiman & Veugelers, 2002; Miotti & Sachwald, 2003; Fontana et al., 2006). It is quite usual for policy-makers the encouragement of the relationship between enterprises and research institutes as a mandatory requisite to subsidize projects with public funds.

Although cooperation with these agents is very useful, enterprises must have an important in-house R&D capability in order to absorb the scientific knowledge generated (Cohen & Levinthal, 1990). Although universities and their research institutes are acknowledged as key players in new product development, their role in the innovation process is not yet totally clarified (Reichstein & Salter, 2006).

Research framework

The first step will be to identify the sectors of Portuguese economy more willing to engage in cooperation initiatives in order to accomplish innovation. Secondly, a more detailed analysis on the scale and scope of their cooperation is developed, i.e., which sources and/or agents they mostly use (scope) and with which relative intensity (scale).

The CIS instrument and sampling

For this study a secondary dataset was used from the CIS-2012 (DGEEC, 2014). The CIS, operation acronym in the Eurostat for Community Innovation Survey, is the main statistical survey (mandatory for EU member states) on innovation in companies. European Union employs this main statistical instrument to monitor Europe's progress in the area of innovation, which is conducted by national statistical offices. In Portugal, following the methodological recommendations of Eurostat, the CIS aims to directly collect information on innovation (product, process, marketing, and organizational) in companies. Data collection, corresponding to the period of 2010-2012, was performed during 2014 through an online electronic platform. The universe contemplates Portuguese companies with 10 or more employees belonging to the NACE codes (economic activities) in Table 2. The sample consisted of 9423 companies, based on census combination (for companies with 250 or more persons employed) and random sampling for other companies. Of the 7995 companies of the corrected sample, 6840 valid answers were considered corresponding to a response rate of 86%.

The CIS instrument provides useful information on how firms interrelated with its surrounding external environment in order to access information considered important for the development of new innovation projects or the completion of existing ones. Firms may use external agents as information sources or engage in more formal cooperation activities, meaning their active participation with other enterprises or institutions on innovation accomplishments.

Table 2 – Sample distribution by sector in CIS 2012 instrument

NACE REV3	Description	Nº of firms
7 – 9	Mining and quarrying	73
10 – 12	Food, beverages, tobacco	323
13 – 18	Textiles, wearing, leather, wood, paper, printing	889
19 – 25	Coke, chemicals, non-metal, metal products	1436
26 – 27	Computer, electrical equip	144
28 – 33	Machinery, transport equip, furniture	808
35 – 39	Electricity, gas, water supply, sewearage, waste	284
42 – 43	Construction	36
46 – 53	Wholesale, retail trade, transportation, storage	1642
58 – 63	Information, communication	376
64 – 75	Financial, insurance, legal, accounting, others	735
86	Health	94
Total		6840

Source: Own elaboration based on CIS 2012 data

Conceptualisation

The nature of innovation

Product (good or service) innovation

This study focuses on product and process innovations. The CIS instrument considers that product innovation occurs when a firm introduces to the market a new or significantly improved good or service with respect to its capabilities, technical specifications, user friendliness, components or sub-systems. Improved good or service does not need to be new to the market; however it must be new to the firm and it should not matter if it was originally developed by the firm or by other external partners.

It is considered that product innovation occurs if the firm answered positively to one of the two questions in Table 3. In consequence, these two variables were transformed into a single variable named product/service innovation (INOV_PRD_SRV) with a 0="No"; 1="Yes" coding.

Table 3 – Variables for product/service innovation

Product/ service innovation questions		
Variable	Description	Coding
INPDGD	During the reference period, did your firm introduce new or significantly improved goods?	0 = "No"; 1 = "Yes";
INPDSV	During the reference period, did your firm introduce new or significantly improved services?	0 = "No"; 1 = "Yes";

Source: Own elaboration based on CIS 2012 data

Process innovation

Process innovation occurs when a firm implements a new or significantly improved production process, or new and significantly improved method of supplying services, or supporting activity (Table 4). Purely organizational or managerial changes are excluded. This innovation does not need to be new to market; however, it must be new to the firm not mattering if it was originally developed by the firm or by other external partners.

Table 4 – Variables for process innovation

Process innovation questions		
Variable	Description	Coding
INSPD	Did the firm introduce new or significantly improve methods of manufacturing or producing goods or services?	0 = "No"; 1 = "Yes";
INPSLG	Did the firm introduce new or significantly improve logistics, delivery or distribution methods for your inputs, goods or services?	0 = "No"; 1 = "Yes";
INPSSU	Did the firm introduce new or significantly improve supporting activities for your processes, such as maintenance systems or operations for purchasing, accounting, or computing?	0 = "No"; 1 = "Yes";

Source: Own elaboration based on CIS 2012 data

It was considered that the firm really implemented a process innovation if it answered positively to one of those three questions. Then, these three variables were transformed into a single variable named process innovation (INOV_PROC) with a 0="No"; 1="Yes" coding.

The nature of the innovation process

Firms were asked about the way product and process innovations have been developed. To the question: "Who developed the innovation", four possible answers were available: (1) The firm; (2) The firm in cooperation with other firms or institutions; (3) The firm adopting or modifying goods or services originally developed by other firms or institutions; (4) Other firms or institutions.

An objective of this work is to identify the sectors that most engage in cooperation initiatives in order to accomplish innovation. Thus, we distinguished between 'cooperation-based innovators' and 'firm-based innovators'. Table 5 gives the frequencies for these variables (with a 0="No"; 1="Yes" coding). The percentages indicate the proportion of firms with positive answers. And the innovation rate is given by the ratio between the number of innovative firms (implementing a product or process innovation) and the total number of sample firms.

We are excluding the adoption of innovation developed by others. Although being important to measure knowledge diffusion, it is not relevant for the purpose of this investigation as well as not very representative in our sample.

Table 5 – Cooperation-based vs firm-based innovation

	Innovation rate	Coop-based innovation	Firm-based innovation
Product Innovation	33%	16%	28%
Process Innovation	40%	19%	29%

Source: Own elaboration based on CIS 2012 data

These percentages show that process innovation is more developed than product innovation. This incidence could be related to the present economic crisis, the worst influences of which began in 2008. With lower investments, product/service innovations were most likely postponed. However, investigation of other CIS periods will be necessary for more accurate longitudinal discussions. And firm-based innovation is higher than cooperation-based initiatives for both types of innovation. Especially in product innovation, firms tend to be more cautious and reluctant to cooperate as it concerns the exposure of potentially profitable new products. Findings reveal that many Portuguese firms are still closed to internal resources, missing several opportunities (Chesbrough 2003a; Laursen & Salter 2006).

Bigger firms, with head offices abroad, use both internal and external environments more often (Rigby & Zook 2002; Navarro 2002) achieving successful innovations (Cohen & Levinthal 1990). Outsiders can provide diverse solutions to complex problems and foster combined innovation to generate new ideas and applications, influencing a firm's ability to innovate positively. The trend is towards open innovation due to crises, globalization, Internet potential and innovation sustainability. The uniqueness and multi-functionality of products and experiences require specialized competencies that experts must deliver. Thus, partnerships and other integrated initiatives and information are fundamental.

Results

The nature of the innovation process by sector

The following table (Table 6) shows the percentages obtained for cooperation and firm-based innovation by sector and type of innovation. Thus, the sectors that most innovate are Computer manufacturing, electronic and optical products; insurance, reinsurance and pension funding and scientific research and development (R&D). The sectors that most cooperate for innovation purposes are insurance, reinsurance and pension funding followed by retail trade and then computer manufacturing, electronic and optics. However, firm-based innovation is higher than cooperation-based innovation for the majority of sectors in both types, especially in product innovation. Firms tend to be more open to collaborate with others when there is no new product involved.

Table 6 – Cooperation-based vs. firm-based innovation by sector

NACE code	Sector	Product Innov	Process Innov	Prod. Innov - Coop based	Proc. Innov - Coop based	Prod. Innov - Firm based	Proc. Innov - Firm based
26	Computer manufacturing, electronic and optical products	73,6%	67,9%	45,3%	41,5%	62,3%	50,9%
42	Civil engineering	24,0%	56,0%	12,0%	40,0%	16,0%	32,0%
47	Retail trade, except motor vehicles and motorcycles	46,7%	73,3%	46,7%	46,7%	40,0%	60,0%
65	Insurance, reinsurance and pension funding, except compulsory social security	72,7%	67,3%	50,9%	47,3%	58,2%	49,1%
72	Scientific research and development (R&D)	63,3%	56,7%	40,0%	30,0%	56,7%	46,7%
86	Human health activities	53,2%	54,3%	33,0%	40,4%	51,1%	38,3%

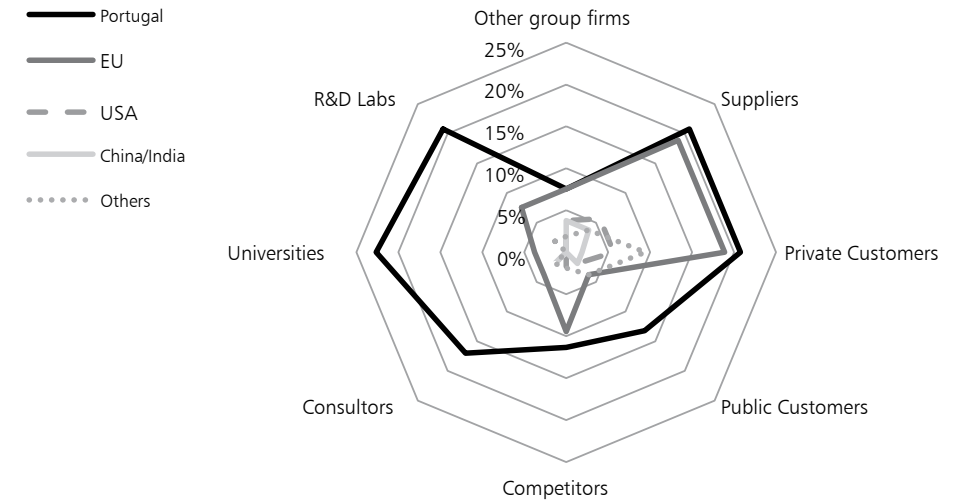
Source: Own elaboration

The scale and scope of cooperation

According to the design of CIS, firms may cooperate with different partners such as: other firms in the group; suppliers; customers; competitors; consultants; universities and R&D laboratories. And the geographical scale of cooperation may vary, as cooperation can be developed with: Portuguese partners; European partners; USA; China/India or others. However the following figures show that there is a focus on national partners.

Besides identifying the sectors more willing to engage in cooperation initiatives in order to innovate (Table 6), the following charts allow comparing the cooperation sources/ agents used by sector (scope) and relative intensity of use (scale). In the computer sector (Figure 1), whose incidence is in firm-based product innovation, the external sources/ agents most used are universities and R&D labs, followed by suppliers and private customers. This could be related to the previously referred reluctance of exposing new ideas/products to concurrence.

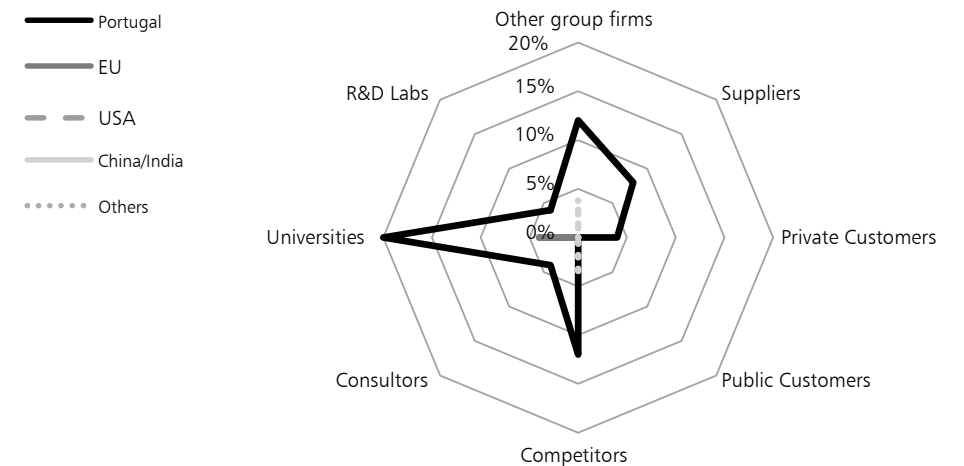
Figure 1 – Scale and scope of cooperation in the Computer sector



Source: Own elaboration

In the civil engineering sector (Figure 2), whose incidence is in cooperation-based process innovation, the external sources/agents most used are universities and competitors, followed by other group firms. Indeed, civil engineering enterprises count on their firms' group for expanding and sharing costs. Competitors can be a useful source or cooperating agent for creativity, knowledge transfer and internationalization. And these goals can be attained through process innovation.

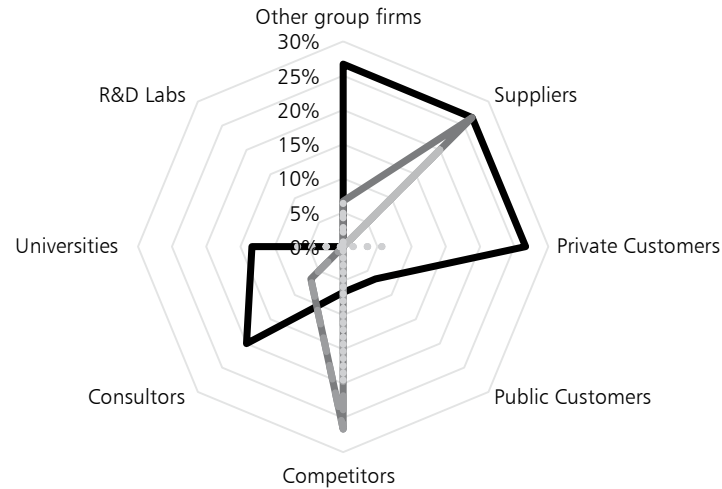
Figure 2 – Scale and scope of cooperation in the Civil engineering sector



Source: Own elaboration

In the retail trade sector (Figure 3), whose incidence is in firm-based process innovation, the external sources/agents most used are other group firms, suppliers and private customers. Many times, retail trade enterprises innovate in services and supporting processes (orders, delivery, cross-selling, after-sales, online shopping, etc.). And increasingly they develop innovations based on private customers' suggestions and contributions (even through social networks). Suppliers are also an important source/agent of information and market penetration.

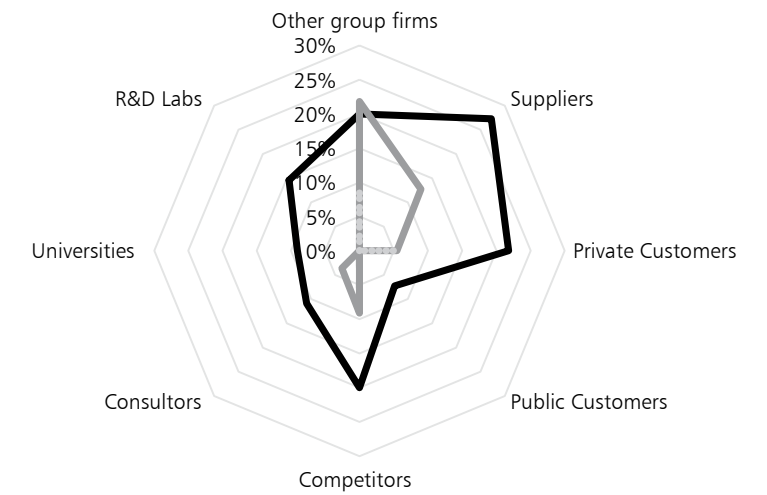
Figure 3 – Scale and scope of cooperation in the Retail trade sector



Source: Own elaboration

In the insurance sector (Figure 4), whose incidence is in cooperation-based product innovation, the external sources/agents most used are suppliers, followed by private customers and competitors. Like consultancy, these firms can provide a stream of innovations to clients which need external expert knowledge to face trends of business dynamics (McKenna 2006). In this kind of sectors, strong interactions between providers and customers arise where each transaction is tailored to their needs. As knowledge-intensive services, they provide innovations to several agents who need expert knowledge to face business challenges. Thus, partnerships and other integrated initiatives and information are fundamental (Cesário et al., 2015).

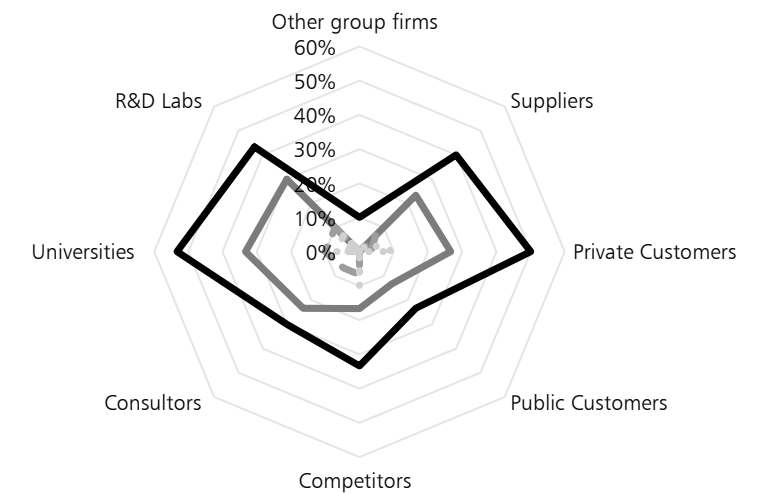
Figure 4 – Scale and scope of cooperation in the Insurance sector



Source: Own elaboration

In the R&D sector (Figure 5), whose incidence is in firm-based product innovation, the external sources/agents most used are universities and private customers, followed by R&D labs. As in the computer sector, with the same incidence and sources/agents used, this could be related to the referred reluctance of exposing new products to concurrence.

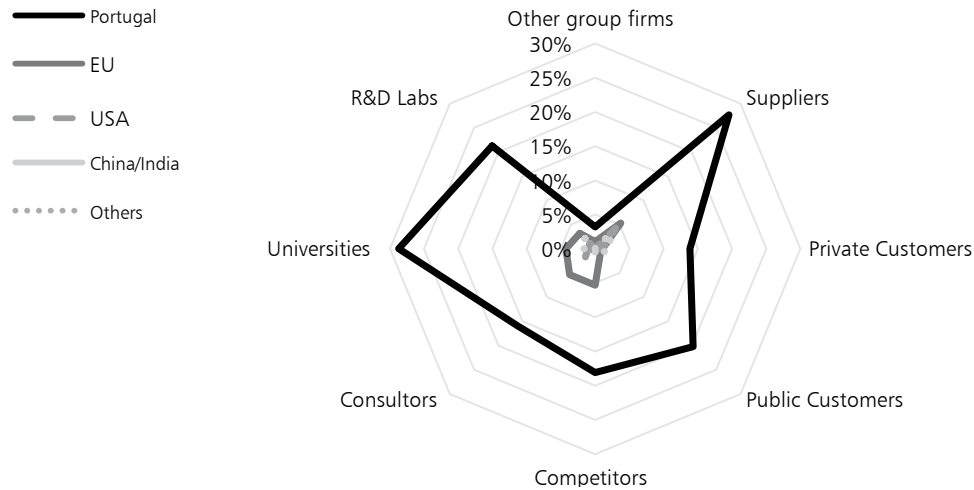
Figure 5 – Scale and scope of cooperation in the R&D sector



Source: Own elaboration

Finally, in the health sector (Figure 6), whose incidence is in firm-based product innovation, the external sources/agents most used are universities, followed by suppliers and R&D labs.

Figure 6 – Scale and scope of cooperation in the Health sector



Source: Own elaboration

From these figures, we can acknowledge that main innovating sectors in the Portuguese economy are research-based (computer, civil engineering, R&D) or knowledge-based (insurance, health) or service-based (retail trade). The external sources/agents most commonly used by the first are universities, suppliers by the second and firms' group by the third. Private customers are important sources for all types of sectors, what means that Portuguese firms generally use customers' information and relations for innovation purposes. These results are in line with the fact that Portuguese economy is mainly based on small and medium-sized firms (SME) which increasingly focus on services and knowledge. Customers' data allow to expand the knowledge-base within their applied research and to materialize knowledge into goods and services. Cooperation with customers endorse firms to develop R&D activities which involve the search for solutions to specific problems that affect the firms' core business areas (Sánchez-González & Herrera, 2014).

Conclusion

The present research aims identifying the sectors of Portuguese economy more involved in cooperation to accomplish innovation. After appraising the nature of the innovation process in terms of cooperation or firm-based innovation, a more detailed analysis on the scale and scope of cooperation is developed, i.e., an assessment of the sources and/ or agents Portuguese firms most use (scope) and with which relative intensity (scale).

Findings reveal that main innovating sectors in the Portuguese economy are research-based, knowledge-based and service-based. The external sources/agents most commonly used by the first are universities, suppliers by the second and firms' group by the third. Private customers are important sources for all types of sectors, what means that Portuguese firms generally use customers' information and relations for innovation purposes. These results corroborate the fact that Portuguese firms are mainly small and medium-sized and increasingly focus on services and knowledge.

In present economies firms need to balance internal sources and competences with ideas from outside and interact with a large number of players (Lundvall, 2010; Laursen & Salter, 2006). This is the main strength of the open innovation model in which external knowledge connections are a vital factor and a complement to internal research (Chesbrough et al., 2006). However Portuguese firms are less mature in open innovation comparing to other European countries. For instance, an attribute of the 'sixth generation' model of innovation (Kotsemir & Meissner, 2013) is the strategic integration with competitors¹. Nevertheless, this cooperation agent is used by few sectors of the Portuguese economy, as our results illustrate. Also the firms' capacity to explore the knowledge provided by external agents depends on the openness toward new opportunities which, in turn, depends on the firm's knowledge stock and on the qualification of its employees (Pinto et al., 2015).

An interesting initiative that has been stimulating the propensity of Portuguese firms for open innovation are the innovation accelerator programs (for start-ups' launching and support). Facing the increasingly dynamic economy, diverse partners can provide solutions to complex problems, foster combinatorial innovation and share risks and costs of radical innovations. Open innovation is crucial due to crises, globalization, internet potential and innovation sustainability. This model of innovation can create conditions for uniqueness and multi-functionality of products and services. From 2008 a global crisis influenced Portugal's economy, affecting many firms. Future research should explore this topic using other CIS datasets and other sectors to verify which changes occur concerning innovation assets.

Acknowledgements

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¹ Other attributes of the sixth generation of innovation are: better internal communication, tacit/informal knowledge, digital connectivity among the group firms, and intensive use of knowledge.

References

- Abramovsky, L., Kremp, E., López, A., Schmidt, T. & Simpson, H. (2005) Understanding co-operative R&D activity: Evidence from four European countries. *Economics of Innovation and New Technology*, 18(3), 243-265.
- Amara, N. & Landry, R. (2005) Sources of information as determinants of novelty of innovation in manufacturing firms: Evidence from the 1999 statistics Canada innovation survey. *Technovation*, 25, 245-259.
- Archibugi, D., Cesaratto, S. & Sirilli, G. (1991) Sources of innovative activities and industrial organization in Italy. *Research Policy*, 20, 299-313.
- Baregheh, A., Rowley, J. & Sambrook, S. (2009) Towards a multidisciplinary definition of innovation. *Management Decision*, 47, 1323-1339.
- Bayona, C., García-Marco, T. & Huerta, E. (2001) Firms' motivations for cooperative R&D: An empirical analysis of Spanish firms. *Research Policy*, 30, 1289-1307.
- Becker, W. & Dietz, J. (2004) R&D cooperation and innovation activities of firms -evidence for the German manufacturing industry. *Research Policy*, 33(2), 209-223.
- Belo, A., Fernandes, S. & Castela, G. (2016) Social network enterprise behaviors and patterns in SMEs: Lessons from a Portuguese local community centered around the tourism industry, *Technology in Society*, 44, 15-22. doi:10.1016/j.techsoc.2015.11.004
- Bessant, J. & Rush, H. (1995) Building bridges for innovation: The role of consultants in technology transfer. *Research Policy*, 24, 97-114.
- Bidault, F., Despres, C. & Butler, C. (1998) The drivers of cooperation between buyers and suppliers for product innovation. *Research Policy*, 26, 719-732.
- Brettel, M. & Cleven, N. (2011) Innovation Culture, Collaboration with External Partners and NPD Performance. *Blackwell Publishing Ltd*, 20(4), 253-272.
- Bruce, M. & Morris, B. (1998) In-house, outsourced or a mixed approach to design, In: Bruce, M. & Jevnaker, B. (Eds.) *Management of design alliances: Sustaining competitive advantage*, Wiley, Chichester.
- Cassiman, B. & Veugelers, R. (2002) R&D cooperation and spillovers: Some empirical evidence from Belgium. *American Economic Review*, 92(4), 1169-1184.
- Castro, E. & Fernández, I. (2006) La I+D empresarial y sus relaciones con la investigación pública española, In: J. Sebastián and E. Muñoz (Eds.) *Radiografía de la investigación pública en España*, Biblioteca Nueva, Madrid.
- Cesário, M., Fernandes, S., Jesus, B. & Barata, J.M. (2015) Sources of innovation: The case of Portuguese consultancy sector, *Journal of Technology Management and Innovation*, 10(3), 44-52.
- Chatterji, D. (1996) Accessing external sources of technology. *Research Technology Management*, 39, 48-56.
- Chesbrough, H. (2003a) The era of open innovation. *Sloan Management Review*, Summer, 35-41.
- Chesbrough, H. (2003b) *Open innovation: The new imperative for creating and profiting from technology*, Boston, MA: Harvard School Press.
- Chesbrough, H., Vanhaverbeke, W. & West, J. (2006) *Open innovation: Researching a new paradigm*, London: Oxford University Press.
- Chung, S. & Kim G. (2003) Performance effects of partnership between manufacturers and suppliers for new product development: The supplier's standpoint. *Research Policy*, 32, 587-603.
- Cohen, W. & Levinthal D. (1990) Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35, 128-152.
- Cornish, S. (1997) Product innovation and the spatial dynamics of market intelligence: Does proximity to markets matter?. *Economic Geography*, 73, 143-165.
- Damanpour, F. & Schneider, M. (2006) Phases of the adoption of innovation in organizations: Effects of environment, organization, and top managers. *British Journal of Management*, 17, 215-236.
- DGEEC (2014), CIS 2012 - Community Innovation Survey. General Direction of Statistics in Education and Science, <http://www.dgeec.mec.pt/np4/207/> (accessed in June 2015).
- Drejer, I. & Jørgensen, B.H. (2005) The dynamic creation of knowledge: Analysing public-private collaborations. *Technovation*, 25, 83-94.
- Enkel E., Gassmann O. & Chesbrough H. (2009) Open R&D and open innovation: Exploring the phenomenon. *R&D Management*, 39(4), 311-316.
- Ettlie, J.E. & Reza, E. (1992) Organizational integration and process innovation. *Academy of Management Journal*, 34(4), 795-827.
- Evangelista, R. (1996) Embodied and disembodied innovative activities: Evidence from the Italian innovation survey, OECD, Paris.
- Fontana R., Geuna, A. & Matt, M. (2006) Factors affecting university-industry R&D projects: The importance of searching, screening and signaling. *Research Policy*, 35, 309-323.
- Freel, M. & Harrison, R. (2006) Innovation and cooperation in the small firm sector: Evidence from Northern Britain. *Regional Studies*, 40(4), 289-305.
- Freeman, C. (1991) Networks of innovators: A synthesis of research issues. *Research Policy*, 20, 499-514.
- Hagedoorn, J., Albert, N.L. & Vonortas, N.S. (2000) Research partnerships. *Research Policy*, 29(4-5), 567-586.
- Håkansson, H. & Eriksson, A. K. (1993) Getting innovations out of supplier networks. *Journal of Business-to-Business Marketing*, 1, 3-16.
- Hanna, V. & Walsh, K. (2008) Interfirm cooperation among small manufacturing firms. *International Small Business Journal*, 26(3), 299-321.
- Harabi, N. (2002) The impact of vertical R&D cooperation on firm innovation: An empirical investigation. *Economics of Innovation and New Technology*, 11(2), 93-108.
- Hernandez, B., Jiménez, J. & Martín, M.J. (2008) Extending the technology acceptance model to include the IT decision-maker: A study of business management software. *Technovation*, 28, 112-121.
- Jeppesen, L.B. (2002) Making consumer knowledge available and useful. The case of the computer games, DRUID Working Paper No. 01-10, 2nd version.
- Kotsemir, M. & Meissner, D. (2013) Conceptualizing the innovation process - trends and outlook, MPRA Paper No. 46504, National Research University - Higher School of Economics, Munich Personal Repec Archive.
- Kuznets, S. (1962) Inventive activity: Problem of definition and measurement, In: National Bureau of Economic Research (Eds.) *The rate and direction of inventive activity: Economic and social factors*, Princeton: Princeton University Press.
- Lambe, C.J. & Spekman, R.E. (1997) Alliances, external technology acquisition, and discontinuous technological change. *Journal of Product Innovation Management*, 14, 102-116.
- Laursen, K. & Salter, A. (2006) Open for innovation: The role of openness in explaining innovation performance among UK manufacturing firms. *Strategic Management Journal*, 27(2), 131-150.
- Leonard-barton, D. (1995) *Wellsprings of knowledge: Building and sustaining the sources of innovation*, Boston: Harvard Business Press.
- Lundvall, B.A. (1988) Innovation as an interactive process: From user-producer interaction to the national system of innovation, In: Dosi, G., Freeman, R., Nelson, G., Silverberg, G. & Soete, L. (Eds.) *Technical Change and Economic Theory*, London: Pinter.
- Lundvall, B.A. (2010) *National systems of innovation: Towards a theory of innovation and interactive learning*, London: Anthem Press.
- Malecki, E. & Tootle, D. (1996) The role of networks in small firm competitiveness. *International Journal of Technology Management*, 11(1-2), 43-57.
- McKenna, C.D. (2006) *The world's newest profession: Management consulting in the twentieth century*, Cambridge: Cambridge University Press.
- Miotti, L. & Sachwald, F. (2003) Co-operative R&D, why and with whom? An integrated framework of analysis. *Research Policy*, 32, 1481-1499.
- Mowery, D. & Rosenberg, N. (1989) *Technology and the pursuit of economic growth*, Cambridge: Cambridge University Press.

Navarro, A. (2002) La cooperación para la innovación en la empresa española desde una perspectiva internacional comparada. *Revista Economía Industrial*, 346, 47-66.

Nijssen, E., Van Reekum, R. & Hulshoff, H. (2001) Gathering and using information for the selection of technology partners. *Technological Forecasting and Social Change*, 67(2), 221-237.

Pavitt, K., Robson, M. & Townsend, J. (1987) The size distribution of innovating firms in the UK: 1945-83. *Journal of Industrial Economics*, 35, 297-316.

Peteraf, M. (1993) The cornerstones of competitive advantage: A resource-based view. *Strategic Management Journal*, 14(3), 179-191.

Pinto, H., Fernandez-Esquinas, M. & Uyarra, E. (2015) Universities and knowledge intensive business services (KIBS) as sources of knowledge for innovative firms in Peripheral regions, *Regional Studies*, 49(11), 1873-1891.

Pittaway, L., Robertson, M., Munir, K., Denyer, D. & Neely, A. (2004) Networking and innovation: A systematic review of the evidence. *International Journal of Management Reviews*, 5-6(3-4), 137-168.

Powell, W.W., Koput, K.W. & Smith-Doerr, L. (1996) Interorganisational collaboration and the local of innovation: Networks of learning in biotechnology. *Administrative Science Quarterly*, 41, 116-145.

Proprius, L. (2002) Types of innovation and inter-firm cooperation. *Entrepreneurship & Regional Development*, 14(4), 337-353.

Reichstein, T. & Salter, A. (2006) Investigating the sources of process innovation among UK manufacturing firms. *Industrial Corporate Change*, 15, 653-682.

Rigby, D. & Zook, C. (2002) Open-market innovation. *Harvard Business Review*, 80(10), 80-89.

Rosenfeld, S. (1996) Does cooperation enhance competitiveness? Assessing the impacts of inter-firm collaboration. *Research Policy*, 25(2), 247-263.

Rothwell, R. (1992) Successful industrial innovation: Critical factors for the 1990s. *R&D Management*, 22, 221-239.

Sampson, R. (2007) R&D Alliances and firm performance: The impact of technological diversity and alliance organization on innovation. *Academy of Management Journal*, 50(2), 364-386.

Sánchez-González, G. & Herrera, L. (2014) Effects of customer cooperation on knowledge generation activities and innovation results of firms. *Business Research Quarterly*, 17(4), 292-302.

Santamaría, L. & Rialp, J. (2007) Determinantes de la elección del socio tecnológico: Especificidades sectoriales y de tamaño. *Cuadernos Económicos del ICE*, 73, 37-64.

Shan, W., Walker, G. & Koput, B. (1994) Interfirm cooperation and startup innovation in the biotechnology industry. *Strategic Management Journal*, 15(5), 387-394.

Shapira, P., Roessner, J.D. & Barke, R. (1995) New public infrastructure for small firm industrial modernization in the USA. *Entrepreneurship and Regional Development*, 7(1), 63-84.

Smith, H.L. (1993) Externalization of research and development in Europe. *European Planning Studies*, 1(4), 465-482.

Spencer, J.W. (2003) Firms' knowledge-sharing strategies in the global innovation system: Empirical evidence from the flat panel display industry. *Strategic Management Journal*, 24, 217-233.

Szulanski, G. (1996) Exploiting internal stickiness: Impediments to the transfer of the best practice. *Strategic Management Journal*, 17, 27-43.

Tether, B.S. (2002) Who co-operate for innovation, and why. An empirical analysis. *Research Policy*, 31, 947-967.

Veugelers, R. (1997) Internal R&D expenditures and external technology sourcing. *Research Policy*, 26(3), 303-315.

Veugelers, R. & Cassiman, B. (1999) Make and buy in innovation strategies: Evidence from Belgian manufacturing firms. *Research Policy*, 28, 63-80.

Von Hippel, E. (2005) *Democratizing innovation*, Cambridge, MA: Ed. MIT Press.

CHAPTER 5

Innovation towards more Resilient Territories: a Case Study from the Serra da Estrela, Portugal

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Introduction

In Portugal, mountainous areas, similarly to the ones of the Mediterranean basin, were characterized, for several decades, by intense agricultural, forestry and herding activities, based on territorial ranking in order to extract maximum productivity (MacDonald *et al.* 2000; Nunes, 2008; Arnaez *et al.*, 2011). In fact, physical and natural constraints (the irregularity of the main climate elements, the steep slopes, nutrient poor soils, among others) alongside with the population rout from the rural and agricultural space and, more recently, the European Union's (EU) agricultural policies promoted the breakdown of the productive system and the massive abandonment of traditional agricultural activities. The subsidiary contribution of these spaces in the economic development process - before the incapacity for adaptation to the new rules established by the markets, due to a set of structural strangling, such as the aforementioned - dictated its marginalization in regards to the decision and consumption centers. This socioeconomic system would come to fall apart with the integration of rural environment in a competitive market directed and controlled by urban areas, operated in Western Europe, whose historic landmark is located in the post-II World War.

Even though the decline of agricultural, herding and forestry activities in the mountain, the residents of the low lands have demonstrated great interest by some of the outputs of the systems for resource's use, stressing several local products as meats, cheeses, sausages, honey or nuts. On the other hand, the heritage wealth of the Portuguese lands, specially highlighting Serra da Estrela, with a broad set of touristic resources due to its natural conditions and cultural heritage, constitutes now a centre of attention.

In this context, the sustainable development of these territories and of the respective local communities depends on its ability to adapt before the large evolving trends of economic, social, environmental, political or technological matrix, according to the perspective of strategic resilience. In Serra da Estrela, the LEADER+ strategy has been rolling around the existence of important and diverse natural, landscaping, cultural, gastronomy and heritage resources, as well as through the valuing of local quality products. As general goals it targets the settling of local population; the strengthening of regional identity; the valuing of endogenous resources; the development of the capacities for attraction; the revitalization of local communities; the

increase of the quality of life for local populations and the promotion of “Serra da Estrela products”.

Thus, the construction of more resilient territories can be a path towards the stimulation of a development that is more sustainable and more adequate to the great evolving trends and its impacts. As mentioned by Santos (2009), resilient territories are territories that are less vulnerable and more prepared to deal with change, complexity, crisis and multiple disturbances (of economic, environmental, technological, social or political character), avoiding disruptions and collapses, thus being more sustainable in the long run. Resilience is, mainly, a way to think and plan the future in a logic of adaptation and valuing of territories.

Regions, just like communities, companies or states, need a prodigious capacity for adaptation in order to face problems and disturbances that are coupled successfully through time, in order to minimize its impacts that, when they are extreme, may lead to disruptions and collapses. Building social and ecological resilience, thus, requires the understanding of the ecosystems it incorporates from local users (Berkes and Folke, 1998). In the same way, the combination of different types and systems of knowledge can increase resilience at a local scale (Davidson-Hunt and Berkes, 2003). In contrast, the lack of attention and sensitivity for local knowledge can increase the vulnerability of population and property. Longworth (2006) considers that what is at stake is mainly the concept of social learning that can be defined as the capacity of societies and communities to learn collectively and share common knowledge, goals and responsibilities for its future development. On the other hand, a growing number of case studies revealed a narrow connection between resilience, diversity and sustainability of social and ecological systems (Berkes and Folke 1998, Adger *et al.* 2001).

This study intends to: (a) analyze the socio-economic trajectories of a mountain territory, giving particular emphasis to the municipality of Manteigas, located in the heart of the Serra da Estrela massif; (b) understand in what way the installation of the company “Casa das Penhas Douradas”, in the municipality, through valuing of human resources and potentialities of this territory, constitutes a structuring element of the respective social and ecological resilience.

The methodology used was centred in the information collection, mainly statistical, regarding the sociodemographic trajectory of the studied municipality, from the 1960’s until today. The information regarding Casa das Penhas Douradas was obtained through a semi-structured/ oriented interview with the respective owners, consolidated with data and dissemination sources of the respective company. Aiming to understand the Casa das Penhas Douradas installation impact and subsequent business niches in the territory they dwell, it was applied an inquiry by closed answer questionnaire online to the workers of this company (in a total of 35 answers – 87.4% of workers) in order to assess the expected individual course, in case they were not working for this company.

Study Area: The Municipality of Manteigas in Serra da Estrela

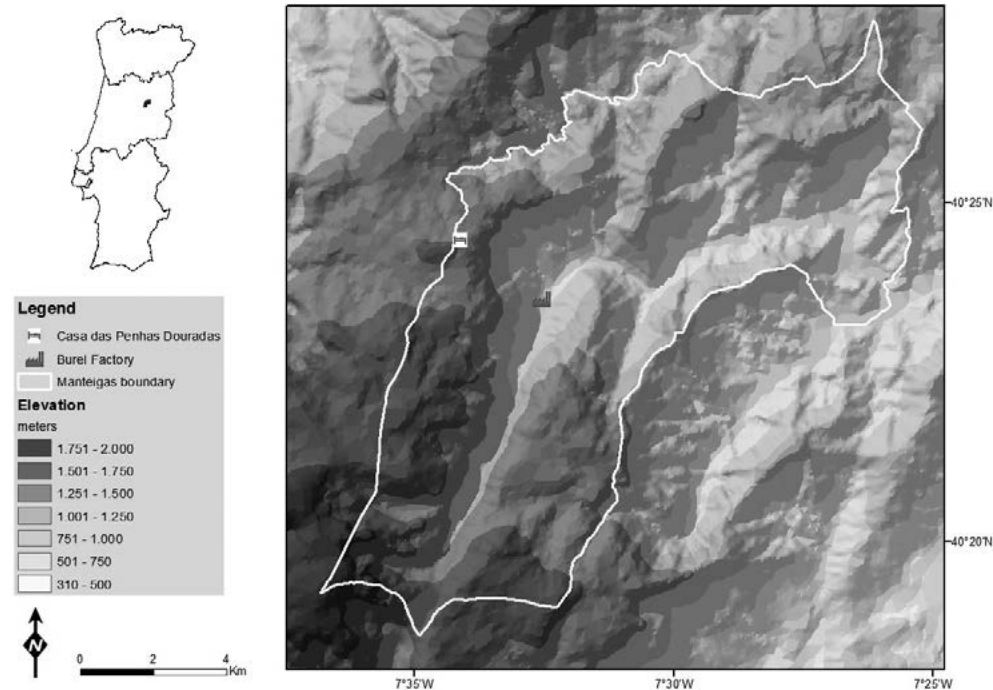
It is estimated that mountain areas occupy around 18% of the national Portuguese territory, from which 11% are above 600 meters of altitude and only 0.5% above 1100 meters of altitude (Cunha, 2003). The 1960’s marked the progressive abandonment of mountain spaces, modifying its territorial reorganization. These areas started to be characterized by a strong demographic regression that resulted in low population densities (Saraiva, 2012) and difficulties in its physical and economic growth. The imbalances of population and economic structure caused exclusion and territorial marginalization. These development ruptures lead these spaces to crisis situations. On the other hand these transformations broke the autonomy of mountain communities who, until then, presented solid relations of cohesion and solidarity (Fernandes, 2009). In this regard, Caeiro (2009: 19) refers to the mountain as “*a socially built space, in which local communities develop their own ways of exploitation of the resources available in Nature, in a sustainable manner, bearing in mind the historical, technical, economic and social context in which they take place*”.

This way, the mountain is used as a target by users who promoted changes in the social structure and in the, thus far, prevalent traditional organization. The rediscovery of the potentialities associated to these spaces provides a growing touristic attraction, in which a greater availability of time, economic resources, means of transportation and leisure equipment attract more and more population (Fernandes, 2009). Nowadays a more and more environmental and cultural valuing of mountain areas is being recorded, developing new uses and expectations, mainly related to tourism.

Cravidão and Cunha (1994: 90) mention that “*tourism, a privileged form of profitability of depressed rural spaces and answer to the desires and expectations of development for its populations, should be properly framed in territorial ordinance plans have into account not only interests in several areas of economic development, but also the needs for preservation of the quality of environmental conditions, i.e., allowing the recovery and economic development of spaces sometime inhospitable and almost repulsive, but without being transposed the thresholds for tolerance of the physical-natural conditions that question the own survival of tourism.*”

The municipality of Manteigas, located in the central part of the Serra da Estrela massif (Figure 1) and completely integrated in the Serra da Estrela Natural Park, concentrates a set of features from a physical and human point of view, that have scarred not only landscapes but also its development strategies. The shapes of tectonic actions of the Hercynian and Alpine cycles (Carrola, 2013), the traces of *Würm* glaciation, particularly the Zêzere glacial valley, the moraine ridges, caves and nunataks and the presence of a rich and differentiated biodiversity, due to its altimetry and bioclimatic features, which are some of the elements which structure the individuality of this area. The physical structure of the municipality is patent in its people and in the activities they developed throughout time. This may be one of the major factors in the social, economic and demographic evolution of this site.

Figure 1 – Location of the municipality of Manteigas and the Penhas Douradas Hotel and Burel Factory



Source: Own elaboration.

Similarly to most of the mountain environments in Portugal, human presence has caused clear tensions regarding the concerns with environmental preservation, but depopulation has been increasing its exposure, due to abandonment of traditional activities essential to the preservation of the diversity of ecosystems (PTD 2007). In fact, demographic and economic trajectories can be divided in two main stages based on the differentiated behaviour before and after the 1960's. Between 1864 and 1960, the municipality presented a positive demographic evolution, growing from 2855 to 6276 inhabitants. The trademark rurality of the territory conditioned the economic activities to the primary sector, where herding was more evident. In 1960, this sector employed around 43% of the employed population. It is followed by the secondary sector based on activities related to the transformation of natural products. According to Saraiva (2012) the textile industry presents as the main economic source of the 20th century for the population in the municipality of Manteigas. Wool gained a major importance as raw material, leading to the development of the wool textile manufacture in the region. In that year, 29% of the whole economic activities and around 73% of the activities integrated in the secondary sector corresponded to that industrial sector. In fact, the wool manufacture were the major propellers of the economy in Serra da Estrela, and in particular of Manteigas, until the end of last century, a time when the region lost its productive competitiveness to other areas, with the closure of almost every factory and consequently with the increase of unemployment.

The period after 1960 brought key transformations to the socioeconomic and demographic structure. The exit of population to urban areas (emigration and inland migrations towards, especially, Lisbon Metropolitan Area) resulted in a demographic decline (in 2011 the municipality had 3430 inhabitants), to which was associated aging (aging index of 288.1% in 2011), which may explained, in part, by a low birth rate (4.1‰ in 2011). At the economic level, this regressive dynamics had its major impact in the reduction of the active population (activity rate of approximately 38% in 2011) (Table 1). Besides, the transformations in national economy were also reflected in the loss of the supremacy of the primary sector, while the tertiary sector increased its weight. CAP and national strategies for rural areas and mountain areas increased the expansion of multifunctionality of these spaces, in which tourism, heritage valuing and potential of endogenous products as elements of differentiation and territorial marketing, gain emphasis.

Table 1 – Sociodemographic comparison of the municipality of Manteigas in 1960 and 2011

Variable	1960	2011	Variation
Resident population (n°)	5276	3430	-1846
Aging index (%)	24,0	288,1	264,1
Rate of activity (%)	57,6	37,8	-19,8
Employed population (n°)	1961	1103	-858
Employed population- primary sector (n°)	846	52	-794
Employed population- secondary sector (n°)	783	291	-492
Employed population- tertiary sector (n°)	332	760	428
Rate of unemployment (%)	2,6	14,8	12,2

Source: INE – Census 1960 and Census 2011

At the same time, the crisis in the textile industry did not only imply an increase in unemployment as it also hampered the reinstatement of lowly qualified people back to the active life (PTD 2007). The once main employing industry in the municipality is nowadays reduced to a handful of small artisanal units. From that peak period of the textile industry, only a few artisans and small companies remained trying to survive by using wool and *burel* in a traditional form (Jacinto and Alves, 2013).

These development trajectories placed the municipality in a situation of social and economic vulnerability. The aged and low qualified human capital and the economics that tends to restructure, now based in local potential like the promotion of tourism, comes with new problems: the economic seasonality caused by the association of the municipality (and Serra da Estrela) to snow tourism and a certain inertia regarding the introduction of innovation and difficulties of creative options turn Manteigas less competitive and resilient. The introduction of exogenous capital both by the settling capacity of younger population who is still in the territory

and by the capture of new agents and new investments, from which the hereby presented case study is an example, might become elements of possible increase of local resilience, thus contributing for the reorientation of local development trajectories.

Vulnerability vs Resilience in Mountain Territories

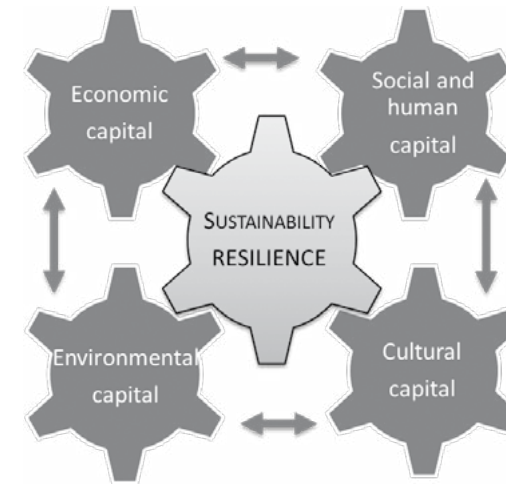
In fact, thinking in the municipality of Manteigas is thinking in a low density territory, with an eccentric position, almost remote, associated to the physical characteristics of mountain areas. In socioeconomic terms, one of the preeminent elements in approaching resilient territories, the municipality also presents some weaknesses: the loss of the herding supremacy, which was followed by the loss of expression of the textile industry, triggered very significant consequences as to employment, while tourism as a structuring economic activity has not been able, on its own, of assuring dynamics.

Thus, the Manteigas municipality presents itself in a context of vulnerability, i.e., having as base the concept of Blaike *et al* (1994, *apud* Gardner and Dekens 2007) being exposed to a set of risks and dangers associated to the competitive (in)capacity of the place in the sense of attracting actors who enable local development, in which human and social capital demonstrate a structuring role. The changes in the structure of local economy have passed to local economic and social structures. The lack of job offers lead to the exit of population to other geographic areas - national and international. This being a selective migration, it has created an imbalance in local age structure, with highlight to the reduction of births and population aging. In social terms, the imbalances were centred in the loss of active population, but mostly in the exit of the more qualified population, with more innovative potential. The ones who stayed are elder, less literate and less qualified. The exceptions come in the particular cases of younger population who, despite having some qualification and relatively higher levels of teaching (a few times reaching higher education), due to the external environment – the 2008 crisis and the growing unemployment and depreciation of life conditions – ended up remaining in the municipality for the financial and housing support offered by the respective parents.

However, one may not forget that the settlement and potentiation of human and social capital will depend on the context of the environment at the level of elements such as environmental capital – pleasantness for the settlement – the cultural capital – creation of more (in)formed resources – and economic capital – in fact what may weigh more in the settlement of population, being a primary resource for employment and individual sustainability.

Resilience depends on a set of elements that constitute as territorial resources for change, highlighting the aforementioned economic capital, human and social capitals, cultural capital and the environmental capital (Sánchez-Zamora *et al* 2014) (Figure 2). That is, local resources must be potentiated in the sense of rehabilitation regarding a socioecological imbalance, valuing localisms as potential competitiveness factor.

Figure 2 – Process of resilience: interactive elements in mountain rural areas



Source: Own elaboration from the read literature

Economic capital is one of the more relevant elements in the creation of resilient territories in the sense it integrates a set of discerned factors, but substantially linked to investment, employment and all the infrastructures (physical and organizational) of the business. Theoretically, a territory will be more resilient as the economic capital is denser, more diversified and solid. That is, a larger number of companies, with a larger diversity of offers, may result in a larger local investment, while making possible to reduce the impacts of shocks/economic crisis by multi-functionality. On the other hand, this density and diversity will create the need to provide the space with infrastructures of support to the economic activity and, therefore, in local employment. However, this physical structure is as resilient as the partnership relations created and the density and distance of topologic networks are larger, in the logic of the theory of strong and weak bonds (Granovetter, 1983).

In Portugal, in rural areas and particularly in mountain areas, there are mainly small companies, many times family businesses, with no large network organization support and with an area of acting reduced to everyday services or specific rarer offers, associated to activities of leisure and tourism. This is, without a doubt, one of the weak spots of these spaces concerning the elements of territorial resilience.

Human capital is recognized as the key to resilience processes, taking effective relevance in the context of transformation of rural areas, and mountain areas in particular. The demographic structure, levels of education and qualification of the population, besides opening to innovation, the contact with other realities and, in a last instance, entrepreneurship, determine the larger capacity of a territory to adapt to crisis situations, being more open to changes. Also here rural areas and, in particular, mountain areas, being more remote, face a set of problems associated to the demographic regression that has been felt since the 20th century. Social capital, on its turn, concerns the established organization relations. A more resilient territory will be the one

that presents greater autonomy, cooperation and efficiency in its institutional structures, being fundamental the constitution of partnerships and the instauration of work networks for a cooperative, volunteer and accountable development process.

This is an aspect that is already being worked by low density territories and, especially, by the actors with the biggest roles in development processes (Covas and Covas, 2014). The perception of the increase of competitiveness through network effort encourages the settlement of different types of cooperation, with particular highlight to the producers (with its more usual and primary version in agricultural cooperatives) and local companies that try to increase in competitiveness through the widening of the offer through an association of partners. However, these topological, physical and institutional relations must be potentiated at the level of Euclidian broadening who also supports the network spaces, in the sense of acquiring new territorialities, new markets and also new elements of connection. On the other hand, social innovation, in the sense of the constitution of new forms of organization, cooperation and institutional work, must also be stimulated, especially fostering an active governance.

However, if the three afore mentioned elements of resilience are found still as problems in the constitution of resilient rural and mountain territories, when approaching the cultural and environmental capital, the issue stops being the (in)existence to being the way to potential and value the endogenous resources. In fact, these areas are rich in cultural heritage (material and immaterial) that can be used economically, both through the revitalization of the ancient know-how, peculiar of each specific geographic area, in the sense of traditional production, introducing an innovation factor that attribute greater innovation, both by the use to service offering, very much linked to the tourism activity and leisure times, and by the production of commercial and exportable products. On the other hand, the location of these spaces grants them physical peculiarities (biodiversity, geology, geomorphology, hydrology) that can be worked from the leisure-tourism point of view, but mostly from the point of view of environmental preservation and awareness, by the constitution of reserve spaces, that allow, at the same time, and experience of knowledge and contact with the environment, while being used as research areas and production activities (agricultural, forestry, energetic).

In reality, it is in this area that the Manteigas municipality is highlighted. At a cultural level, for the identity particularities linked, mostly, to herding, whether in the harsh work throughout the mountain, whether for the art of cheese making and the work in wool transformation. At the environmental level, for its location in the highest mountain in continental Portugal, with traces of *Würm* glaciation, and a biodiversity protected by the figure of the Serra da Estrela Natural Park.

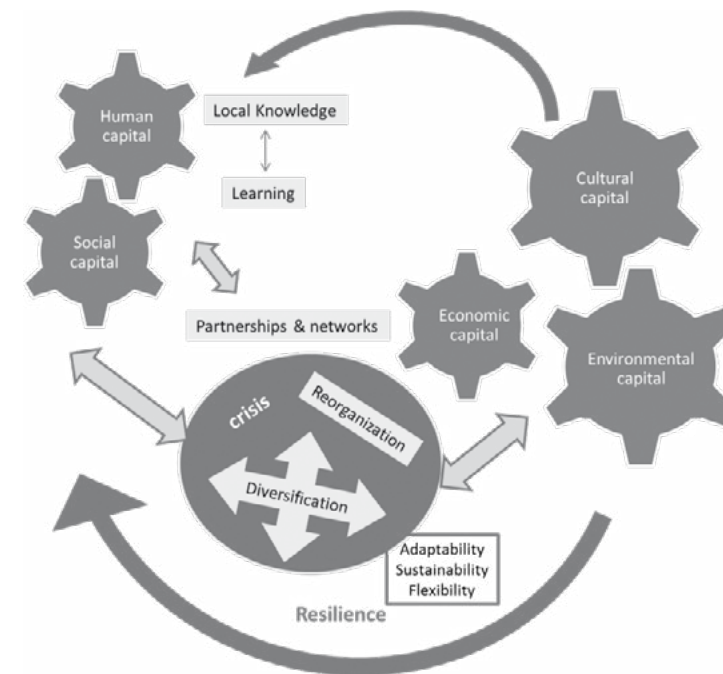
So, a resilient territory needs the combination of all these elements in an integrated, collaborative and interdisciplinary manner, aiming a sustainable development (Santos, 2009), potentiated by the flexibility, adaptability, competitiveness and cohesion. Besides, the construction of resilience goes through processes like learning and diversification, alongside the use of endogenous knowledge, the capability of reorganization and the establishment of networks and partnerships (Gardner and Dekens 2007) (Figure 3).

Learning is a starting point for the change process inherent to resilience. Firstly it should be based on previous crisis situations, i.e., the errors from the past must be taken as examples for future progress. On the other hand, the settlement of weaker bonds (Granovetter 1983) will

allow the creation of knowledge networks that will simplify the exchange of experiences, in a logic of valuing of good practices, which may be a good starting point for the creation of more proactive territories (Santos 2011).

The creation of weak bonds provides the need to generate partnerships that promote the logics of topological spatiality. The establishment of institutional relations is an essential component to the mitigation of socio-ecological impacts, still contributing to an improvement after these periods, thus being a fundamental piece in the construction of resilience. “[...] external linkages and partnership do provide a medium through with resources and assistance flow to the affected are and populations in the event of disaster” (Gardner and Dekens 2007:326).

Figure 3 – Process of resilience: dynamics in creation of resilient territories



Source: Own elaboration

However, the capacity for resilience is not exclusively dependent of the relations with partners. The capacity for self-organization or post-crisis reorganization also becomes fundamental. We refer to the capacity of a territory to establish institutions, to have players and organisms that mitigate the effects of a crisis and generate change, turning once again the human and social capital into a relevant role. However, more than a reactive position, these organisms and institutions must present as actors of anticipation, i.e., actors who promote change before the mentioned crisis takes place.

In this sense, endogenous knowledge is fundamental. On one hand, the experience in perceiving the territory simplifies the preview and perception of the changing socio-ecological system's functioning. Afterwards, local knowledge, in the sense of the endogenous potential for use of resources and establishment of competitiveness for the differentiation becomes important when thinking, for example, in the specific case of the Manteigas municipality, in the work with wool or cheese, as cultural heritage to be transmitted to new generations, for the perpetuation of an identity brand.

To these four elements it is added the issue of diversity. A socially and economically diverse territory creates opportunities of choice assuring the continuity of the system when one of its components collapses and fails. In mountain areas [they] *"provide livelihood options in the form cash employment that can supplement or supersede traditional practices. Tourism livelihood is an example. These opportunities increase income and diversity livelihood options that in combination enhance resilience, however, over-reliance in new opportunities, such as tourism, without attention to diversity may lead to increased vulnerability to hazards"* (Gardner and Dekens 2007:324).

Being territorial resilience the capacity for a territory to recover its dynamic state and find a new path after a disturbance of its environment, there is an important effort by local actors in materializing actions to solve the problem. In this sense, each actor must also be resilient. So, it concerns organizational resilience, a continuous capability of reconstruction through answering or anticipating internal or external shocks based in the creation of centring and authority systems, rationalization of financial management and human resources, development of new marketing strategies, innovation and diversification of the product/service offers. Here, resilience may only translate into skill, through the existence of stable organization structures, to absorb shocks or, in a situation of lesser stability and density of the corporate system, through the need to create new products and new market strategies (Gilly *et al* 2014).

However, it is not possible that dynamic companies/organizations exist in territories that are not dynamic, and vice-versa (Gilly *et al* 2014). The mentioned characteristics contribute to the weak capacity of resilience from Manteigas municipality. In this sense, the dynamics inherent to any actor of local development and more specifically a corporate actor will arise in a logical of a pilot experience. It is in this context that "Casa das Penhas Douradas" arises.

"Casa das Penhas Douradas": An Innovative Company in a Territory in Regression

Casa das Penhas Douradas comes to life in 2006, as Rural Space Tourism, an initiative of two allochthones who decided to invest in the municipality attracted by the richness, natural beauty and culture of the region, but mostly due to the need of changing the sense of their everyday lives. In fact, the dynamics of the municipality does not enable attractiveness in the logic of the creation of a business with large profits. On the contrary, it promotes expectations at the level of improvement of the quality of life, through the perception of a healthier everyday life, especially for the possibility of contact with Nature. It was in that sense that these two investors left their jobs, not at all related to tourism or mountain, and their area of residence an (urban area of

expressive dimension), privileging, more than profit, the pleasure for the work developed and the way of life.

The good results obtained in the first four years lead to the need of a widening the business' dimension, in this concrete case to the extension of the touristic equipment, from 9 to 18 bedrooms, yet including a SPA (from the Latin *salute per aquam*) and achieving a hotel rate of 4 stars. The perception of the quality of the endogenous resources leads to a reflection from the local actors about the potential use, from the reactivation of the local dynamics' point of view, trying to become Manteigas more attractive and competitive. Taking advantage of the hotel's closure during the works of extension and being aware of the importance of the integration of the several local actors, given the company is included in a territory where it is a support of the activity, the owners of Casa das Penhas Douradas, in contact with the local government, promoted a workshop on endogenous products and innovation in the municipality of Manteigas and Serra da Estrela.

It was intended the participation of the whole local community, in a logic of active governance associated to local authorities, to which was associated a set of senior consultants (e.g. BCG – Portugal and Deloitte). With the epithet "knowledges and techniques of the village" the goal of that meeting was the identification of business projects (20 overall) that, from the endogenous resources, could boost the municipality and widen its economic offering.

However, that meeting, despite well accepted by local actors, ended up not having visible practical consequences. Only the owners of the Casa das Penhas Douradas, a few months after, rethought the ideas debated in that workshop and contemplated one more business opportunity: the use of typical food products of the municipality and of the region and the *burel*. So, in 2010, Penhas Douradas Food and Penhas Douradas Factory come to life. These two small businesses were added to the hotel's existing offer, already diversified due to the introduction of the SPA and a congress/meeting room in the hotel equipment and to the set of activities that can be developed by tourists (hiking/MTB/jeep tours, themed workshops, small forestry activities). It was then initiated a process of training at the resilience level, based on diversification, environmental capital and cultural capital.

The endogenous potential: innovation and specialization

The diversification implemented by Casa das Penhas Douradas comes from the acknowledgement of the endogenous potential as promoting element of the economic dynamics. Firstly, the expansion of the own hotel is inserted in a logic of integration in the physical surroundings (Serra da Estrela) being, at the same time, impregnated of a set of elements of local identity. The hotel results from the rehabilitation of an ancient sanatorium, telling the story of Penhas Douradas as touristic resort of healing associated to climatotherapy.

Casa das Penhas Douradas recovers the health logics, not just by healing illness but in the sense of prevention, with the aim of offering well-being and quality of life, by introducing the SPA component in the equipment's offer. On the other hand, the hotel has not lost the local architectural trace, using the structuring lines and materials and transforming them with a modern design.

At the same time, its location (in the heart of the Serra da Estrela Natural Park) impels the obligation of integrating the mountain and respecting it, throughout the whole equipment. It is witnessed an attempt to have the mountain inside the house, whether for the building's own structure, in which the wide glass areas allow panoramic views for the involving space, whether for the use of colours, aromas and decorative materials. We mention the birch used in the furniture, the coating of the SPA's floor in white quartz, the aromas brought for the massage oils or for the teas and biscuits, or the red, green, brown, purple tones that paint the mountain in the several seasons, expressed in several decorative elements.

This idea of transformation of localisms into products of local promotion, but mostly business bases, with the introduction of the innovation element, gains, in this case study, major relevance in the context of extension of the Casa das Penhas Douradas for the smaller transformation industries – Penhas Douradas Food and Penhas Douradas Factory. In the first case it is the valuing of local gastronomy with a use of wild product or by-products of agricultural and herding activity of the municipality and of the mountain and its transformation into *gourmet* products, associating the inherent quality to a sellable and visually appealing brand. It starts being disclosed locally through the hotel's menu, integrating less exporting products (e.g. juniper ice cream, rosemary pudding), existing afterwards another range of production with the sole purpose of selling (e.g. nettle pesto, Serra da Estrela herb jelly, wild honey caramels) which reaches wider markets.

However, it was in the Penhas Douradas Factory (currently Burel Factory) that a greater innovation of the endogenous product took place, and also a greater investment from the owners of Casa das Penhas Douradas. This might have been reflected in a larger impact at the level of development and dynamics of the municipality. Based on the work of wool transformed into *burel* – traditional fabric used in the capes of shepherds, famous for its coarse and rude look and dark colours – the work of the Burel Factory is, in a first stage, the conception of new products, with differentiated functions, alongside with the introduction of new colours.

These ideas started being worked in a small studio, which also emerges in the logic of perception of the need for innovation and recovery of the wool industry still operating in the municipality (*Lanifícios Império*). In this context, innovation is materialized, firstly, in a perspective of social innovation, for the rental of the space in a factory in the beginning of the insolvency procedure, in order to assure income for the respective owners. At the same time, the excess of the work force in *Lanifícios Império* was also absorbed by the small studio of the Burel Factory, thus stopping an imminent dismissal process.

This initial functional relationship came to extend, later on, whether for the growth of the Burel Factory whether for the bankruptcy of *Lanifícios Império*. In practice it was also verified the purchase of the latter industry by the owners of the Casa das Penhas Douradas, a process which also had an innovative character given that, apart from the facilities, the Burel Factory acquired likewise the machinery, raw materials but also a significant part of the employees who were part of the previous factory unit, and all the orders that were to be delivered to clients.

At a product level, Burel Factory presents innovation in the colour of the *burel*, which from black, brown and white now has thirty nine colours (e.g. red, green, blue, pink, yellow), whether in the textures (16 stitches inspired in the Portuguese tradition and culture), but mostly in the functionality for which it are made (e.g. fashion accessories, apparel, decoration, toys, office

materials). In continuity, it is being seen a widening of the offered product and a disaggregation of brands; *Lanifícios Império* has left a legacy of teachings and clients that one sees today in the continuation of the work that goes by the execution of a series of fabric far beyond *burel* (e.g. flannel, tartan); the exclusive work of wool results in products of greater simplicity as blankets, scarves and mufflers, incorporated in a new brand, "*Mantecas*".

This diversification goes even further, surpassing the mere work with wool and its derivatives. The Burel Factory, in the logic of Casa das Penhas Douradas - because it is also associated to the hotel equipment - develops a set of activities linked to tourism, for the general public and for the school community in particular. It is the opening of the factory to the public, in the logics of museology and territorialization of culture and local identities. The factory, for the activity it develops and for the cultural wealth it encloses, in which the machinery is its most valuable element, provided there are looms from all generations (the oldest is from the 19th century), constitutes as an attraction pole to visitors. To all of this it must be added the existence of a congress hall in the facilities of the Burel Factory, and also a set of events that take place inside which enable a greater contact with the population (e.g. music concerts).

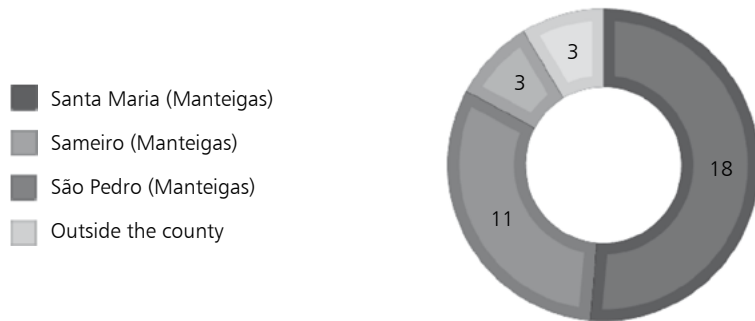
Human capital and Know-How

Human capital arises, firstly and from the company/business point of view, as potential work force. The widening and diversification of the offer linked to Casa das Penhas Douradas are felt in the need to hire more collaborators: from the initial 3 workers in the equipment, today in all the business niches, the team comprehends 40 workers.

The sociodemographic characteristics that the municipality of Manteigas presents could signify an obstacle, firstly to hiring and second to business development: generally an older active population with relatively low qualification levels. To this element joins the fact that the company's dimension, on its own, capture allochthone workers, in connection with the social and economic sense of the owners in wanting to hire population resident in the municipality.

In fact, the analysis to the inquires shows an employed population resident mainly in the Manteigas municipality – only three workers do not reside officially in the municipality, belonging to Seia, Esmoriz and Lisbon (Figure 4). With ages between 19 and 65, more than half is 50 years old or more. The prevalence of the female gender may be related to the type of activities developed, being highly weighed the wool manufacture. Despite the diversity of qualification levels from the collaborators, the low qualification stand out, with 27 from the 35 inquired only having completed secondary teaching or a lower level. As an example, 19 collaborators who only achieved a level equal or lower secondary education. Only 5 of the workers finished a higher level, being associated to the younger and female population (Table 2).

Figure 4 – Residence of the population employed in the different business niches of the Casa das Penhas Douradas



Source: Own elaboration

At the level of distribution of workers in the different business niches, there is a differentiation of profiles: at the hotel, on one hand, are the younger and more qualified (some of the few that remained in the municipality), in some cases with higher training, working in a logic of versatility and rotation of the tasks necessary to the everyday life of the infrastructure, all being prepared to direct contact with customers, while there are older workers, less qualified, many of them former factory workers that, being surpluses to the needs of the Burel Factory, were trained for hotel work; the workers of the *burel* factory, in general, are older and have less qualifications but, for the experience of several years working in the wool industry, bear an important knowledge, which are joined, in a smaller proportion, by younger workers who seek to learn ways to work with wool.

Casa das Penhas Douradas, as well as the Burel Factory, still have a set of non-affiliated workers who support in achieving these projects. They are highly trained professionals, almost always external to the Serra da Estrela region, who cooperate with the company in technical terms. They are designers, concerning the *burel* factory and, for example, the *chef* who structures the hotel's menu and coordinated the products of the Penhas Douradas Food.

This diversity of workers increases the degree of the company's resilience. On one hand, the technical and more qualified knowledge of the younger group with higher education which allows the introduction of more creative, innovative elements, as well as presenting a greater skill for the perception of development trajectories and the pretension of a greater competitiveness. On the other hand, it is the tacit knowledge of someone who worked several decades with wool and loom and knows well local products and potentialities.

Table 2 – Characterization of the population employed in the different business niches of the Casa das Penhas Douradas

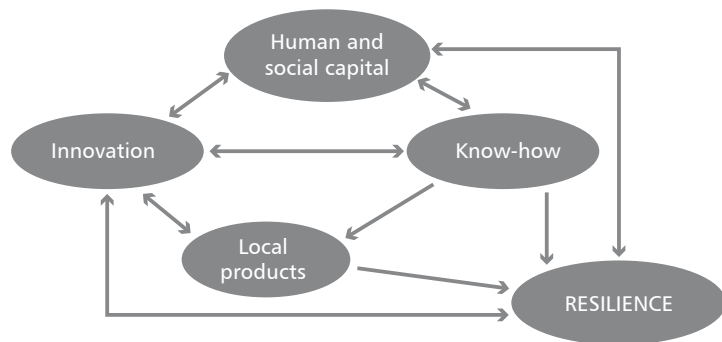
Age (years)	no.	Gender		Education	
			no.		no.
19 - 24	4	Female	1	Secondary education	1
		Male	3	Secondary education	1
25 - 29	3	Female	2	Post-secondary education	2
		Male	1	Secondary education	1
30 - 34	3	Female	2	Secondary education	1
		Male	1	Degree	1
35 - 39	3	Female	3	Secondary education	2
		Male	0	Master	1
40 - 44	2	Female	1	Degree	1
		Male	1	Secondary education	1
45 - 49	1	Female	1	Lower secondary education	1
		Male	0		
50 - 54	7	Female	7	Primary education	1
		Male	0	Basic education	3
55 - 59	9	Female	8	Lower secondary education	2
		Male	1	Lower secondary education	4
≥ 60	3	Female	2	Lower secondary education	1
		Male	1	Basic education	1
TOTAL	35	Female	27	Primary education	3
		Male	8	Basic education	7
		Total	35	Lower secondary education	9
				Secondary education	8
				Post-secondary education	3
				Degree	4
Master	1				
Total	35				

Source: Own elaboration

In this logic, the integration of local human capital, with a practical knowledge, and of human capital (external) with a technological and scientific knowledge (know-what and know-why), institutes a factor of competitiveness. Thus, the idea of endogenous product transformation, in the sense of its valuing, taken by a set of technicians and/or more qualified workers, is validated, adapted or rethought from the knowledge of the workers who show experience in the work with the raw material and can predict its reaction to a certain process. At the same time, these workers, less qualified, enter in a learning process, by being confronted with the need to apply a set of new techniques they have to implement in their work post. The sharing of information between these two groups of professionals is reflected in an increase in knowledge of the more qualified group of technicians and stimulates potential new investigations.

This results in innovation, as the combination of the agile work of human capital, the use of endogenous products and the introduction of new product ideas, corporate organization and transformation of raw materials. This innovation may translate into the creation of new brands, but mostly into new forms of selling local products, what, as a consequence, may reflect in the creation of new images and perceptions of territory that supports this whole process. Besides, tacit knowledge allied to explicit knowledge, the use of local resources and the recognition of its versatility, alongside with the introduction of certain types of innovation, turns the company more capable to predict and react to moments of disturbance in its balance system (Figure 5).

Figure 5 – Human and social capital in the process of resilience



Source: Own elaboration

Resilience is also built in the reciprocity of synergies between the different elements that form the territory. So, apart from human capital in its diversity, as mentioned before, being able to assure innovation and the creation of resilience for the company, it boosts some resilience to this capital, while indirectly transforming the municipality's development strategies. The first impact of the Casa das Penhas Douradas in the municipal population was expressed in the reduction of the social problems related to unemployment, due to the creation of jobs. More than 60% of the inquired were unemployed or at risk of unemployment immediately prior to being hired by the company. This situation stroke especially the older individuals (50 years old or more) and, cumulatively, those with lower qualifications (Table 3).

Table 3 – Population unemployed or at risk of unemployment immediately prior to being hired by Casa das Penhas Douradas

Age (years)	Unemployment or at risk of unemployment	Education							Total
		Primary education	Basic education	Lower secondary education	Secondary education	Post-secondary education	Degree	Master	
19 - 24	Yes				1				1
	No					3			3
25 - 29	Yes				2		1		3
	No								0
30 - 34	Yes								0
	No				1	1	1		3
35 - 39	Yes				2				2
	No							1	1
40 - 44	Yes						1		1
	No				1				1
45 - 49	Yes								0
	No			1					1
50 - 54	Yes	1	2	2					5
	No		1				1		2
55 - 59	Yes	2	1	4					7
	No		1	1					2
≥ 60	Yes		2	1					3
	No								0
TOTAL	Yes	3	5	7	5	0	2	0	22
	No	0	2	2	2	4	2	1	13
	Total	3	7	9	7	4	4	1	35

Source: Own elaboration

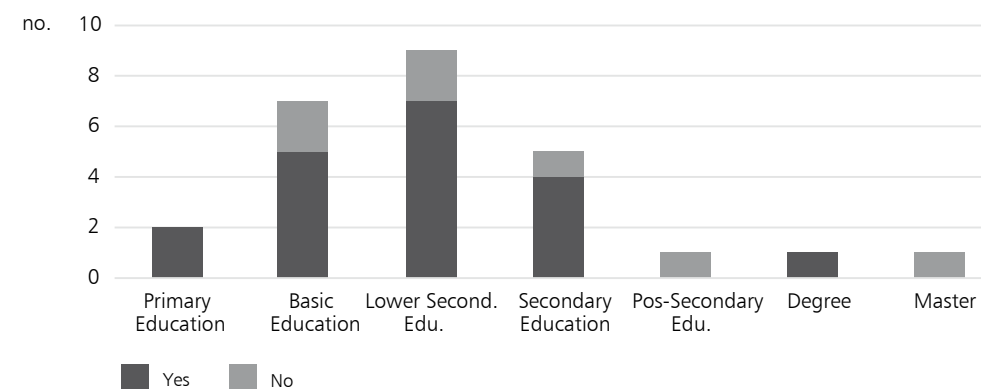
However, we cannot state convincingly the company's capability of population settlement in the territory. Actually, when questioned about the possibility of changing residence in case they were not employed at Casa das Penhas Douradas, and in the respective business niches, almost 75% of the inquired intended to remain in the municipality, being immigration a possible option for only two of the current workers. This attachment to the territory can be seen mostly in the elderly and less qualified population. In part, that may be related not only to the degree of affiliation to the place, but mostly to the understanding of a smaller range of options in more competitive territories and in the risk implied in their exit from the municipality, apart from the investment already made in the location as permanent residence (e.g. house purchase). However, there is still a considerable percentage of individuals under 50 years old (8 out of 15 individuals) who expressed their will to remain in the municipality (Table 4).

Table 4 – Residence perspectives for the workers of Casa das Penhas Douradas in case they were not employed there

Age (years)	Residence	Education							Total
		Primary education	Basic education	Lower secondary education	Secondary education	Post-secondary education	Degree	Master	
		no.							
19 - 24	In the municipality of Manteigas					1			1
	In another national area						2		2
	Emigration				1				1
25 - 29	In the municipality of Manteigas				2		1		3
	In another national area								0
	Emigration								0
30 - 34	In the municipality of Manteigas				1				1
	In another national area					1	1		2
	Emigration								0
35 - 39	In the municipality of Manteigas				2			1	3
	In another national area								0
	Emigration								0
40 - 44	In the municipality of Manteigas								0
	In another national area				1				1
	Emigration						1		1
45 - 49	In the municipality of Manteigas			1					1
	In another national area								0
	Emigration								0
50 - 54	In the municipality of Manteigas	1	3	2					6
	In another national area						1		1
	Emigration								0
55 - 59	In the municipality of Manteigas	1	2	5					8
	In another national area	1							1
	Emigration								0
≥ 60	In the municipality of Manteigas		2	1					3
	In another national area								0
	Emigration								0
TOTAL	In the municipality of Manteigas	2	7	9	5	1	1	1	26
	In another national area	1	0	0	1	3	2	0	7
	Emigration	0	0	0	1	0	1	0	2
	Total	3	7	9	7	4	4	1	35

Source: Own elaboration

Figure 6 – Individuals who intended to remain in the municipality in case of unemployment before being hired by Casa das Penhas Douradas



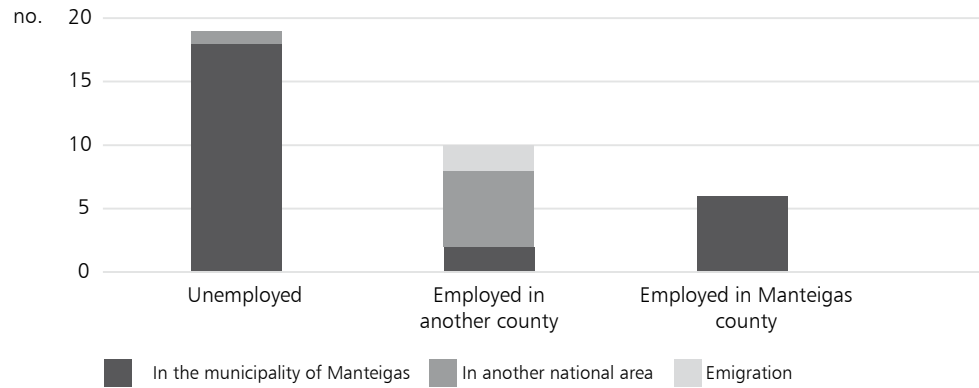
Source: Own elaboration

However, this permanence in the municipality does not seem to be a factor of resilience, but a factor of accommodation to crisis situations. It is worth noticing that most individuals with the previously focused intention had already been in unemployment situations or at risk of being unemployed. Adding to the low qualifications (Figure 6), it is understood that these individuals have contributed to the thickening of a local human and social capital with structural weaknesses – aging, lack of academic qualifications and unemployment.

Besides, not being hired by the Casa das Penhas Douradas would result, from their perspective, in most cases in the permanence in the municipality (18 individuals), even in unemployment situations. Only in six cases the residence continuity in Manteigas could be a result of employment in the municipality. The need to seek work in other geographical areas would imply, for 8 of the 10 individuals with that answer, the change of residence and the exit from the municipality to settle residence in other national or international area (Figure 7).

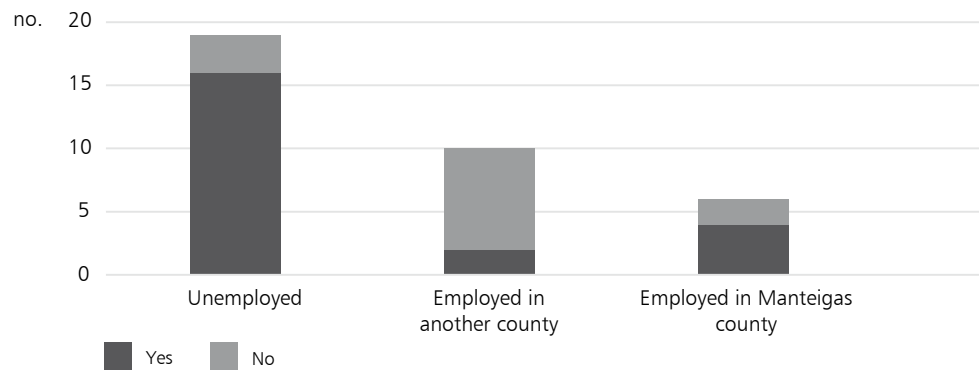
The perpetuation of unemployment periods presents some probability for these individuals: 16 of the 19 individuals indicate the probability of unemployment in case they were not working at Casa das Penhas Douradas because they had already been in that situation or at risk prior to being hired. It is the elder population, in which the proximity to retirement and lower degrees of literacy is an obstacle to changing the work place, functions, adapting to places different from the everyday life. Besides, given the recent situation of the Portuguese work market this population presents, as a result of the presented characteristics, marginalized from the existing employment offers. On the other hand, a more restrictive and heterogeneous group presents a greater probability of adapting to change, by indicating the possibility of finding work in other national or international areas. They are individuals who, prior to being hired, have not been unemployed (Figure 8) and whose qualifications are at the level or higher than the secondary education.

Figure 7 – Potential situation regarding employment and place of residence in case they were not hired by Casa das Penhas Douradas



Source: Own elaboration

Figure 8 – Potential situation regarding unemployment and in case they were not hired by the Casa das Penhas Douradas and unemployment situations prior to hiring



Source: Own elaboration

The results obtained, despite the inexistence of a narrow relation with the settlement of population in Manteigas, again shows the importance of the company in the context of local employment. In fact, 30 of the 35 inquired claim they would be unemployed (19 answers) or employed in another municipality (11 answers) if they have not been hired by Casa das Penhas Douradas in their different business niches. On the other hand, it is witnessed a reintegration and a capture of population of more advanced age group, with very low qualifications who, with the closing of the local textile industry, would potentially be in irreversible unemployment situations. The younger population, with medium or high academic qualifications, by working in Casa das Penhas Douradas, had the opportunity to remain in the municipality through employment. Otherwise they would have moved to other geographic areas looking for job or would have been attached to their origins with no professional occupation and stable income (Table 5).

Table 5 – Perspectives regarding the employment of Casa das Penhas Douradas workers in case they were not working there

Age (years)	Regarding employment situation	Education level							Total
		Primary education	Basic education	Lower secondary education	Secondary education	Post-secondary education	Degree	Master	
		no.							
19 - 24	Unemployed								0
	Employed in another county				1	2			3
	Employed in Manteigas county					1			1
25 - 29	Unemployed				1		1		2
	Employed in another county								0
	Employed in Manteigas county				1				1
30 - 34	Unemployed								0
	Employed in another county					1	1		2
	Employed in Manteigas county				1				1
35 - 39	Unemployed				1			1	2
	Employed in another county				1				1
	Employed in Manteigas county								0
40 - 44	Unemployed								0
	Employed in another county				1		1		2
	Employed in Manteigas county								0
45 - 49	Unemployed			1					1
	Employed in another county								0
	Employed in Manteigas county								0
50 - 54	Unemployed	1	2	2					5
	Employed in another county		1				1		2
	Employed in Manteigas county								0
55 - 59	Unemployed	2	2	2					6
	Employed in another county			1					1
	Employed in Manteigas county			2					2
≥ 60	Unemployed		2	1					3
	Employed in another county								0
	Employed in Manteigas county								0
TOTAL	Unemployed	3	6	6	2	0	1	1	19
	Employed in another county	0	1	1	3	3	3	0	11
	Employed in Manteigas county	0	0	2	2	1	0	0	5
	Total	3	7	9	7	4	4	1	35

Source: Own elaboration

The creation of partnership and dissemination networks

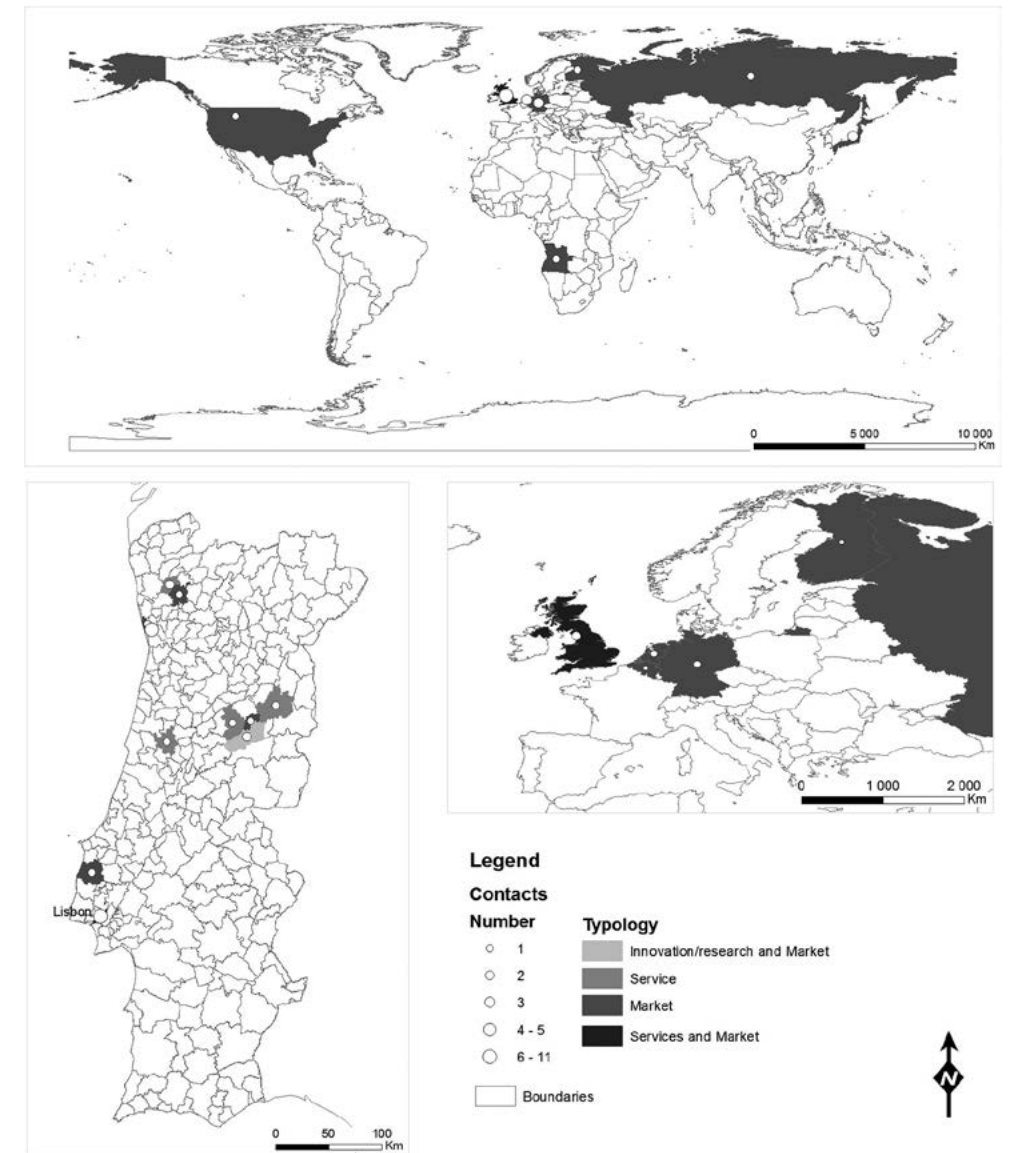
According to Caetano (2003:152), “in order for a local development policy to be efficient it is convenient that there is a synergy between local, corporate and institutional action. However, this is only possible when there are ways of concentration, such as planning agreements, and there are instruments that favour learning and dissemination of knowledge and, still, through the interaction of the actor”. Granovetter (1983) considers that the individuals with whom we have “weak tie” relations are important because they connect us with other groups, thus breaking the configuration of “isolated islands” of clusters and taking the configuration of social networks. So, the structuring of the several networks builds the difference in and for places (Pratt in press) and/or companies.

This is the logic that Casa das Penhas Douradas has taken. Firstly, and at a microscale, the relations between the several acting areas, both for the complementarity of activities – *the Hotel leads tourists into the factory, the factory places its products in the hotel* – and for the cross-over of workers and their requalification in the sense of assurance of employment through replacement in sectors of greater need. Still at a local scale, networks come in the market logic, i.e., the client becomes client of a set of local producers, whether through the purchase of wool to the *burel* factory, whether to the daily products consumed in the hotel (e.g. food, hygiene), contributing, while fulfilling its needs, to the continuity of some microbusinesses and the creation of new dynamics in the municipality’s economy.

At a wider scale, and emphasizing regional synergies, Casa das Penhas Douradas has already a set of partnerships with other hotel units in the Serra da Estrela region in order to stimulate the increase of tourists’ stays. It were promoted complementary activities which enable a more prolonged offer in time and divided by several areas of the mountain, through the articulation of two or more establishments which work as starting and arrival point between the offered leisure activities (e.g. Casas da Lapa – Seia). Aiming to further increment the dissemination of the place, new partnerships are already being made, with new types of establishments – boutique hotels – in a logic of expansion of the offer, widening of the acting territories and broadening of the target audience.

Still at a regional level, also the Burel Factory is constituted as a vortex of the network. On one hand, for the complementarities existing with other specialized industries in working wool, which develop the initial transformation of the raw material, a task that the factory in Manteigas does not have the capability to perform. It is the specific case of washing the wool, which is made in an industry of the Guarda municipality. On the other hand, for the innovative component the factory presents, implying a constant research at the level of materials and products resulting from its transformation, thus narrowing the knowledge with science through the department of Textile Engineering of the University of Beira Interior (UBI).

Figure 9 – Territorial networks of the company by type of relationship



Source: Own elaboration

However, these networks are dispersed in space when connections with more specialized technicians are promoted. In the case of the *burel* factory, the collaborations with designers and architects result in territorial contacts that are expanded to diverse areas in the country like Lisbon, Oporto, Braga or Coimbra, but also to international spaces such as London. This way,

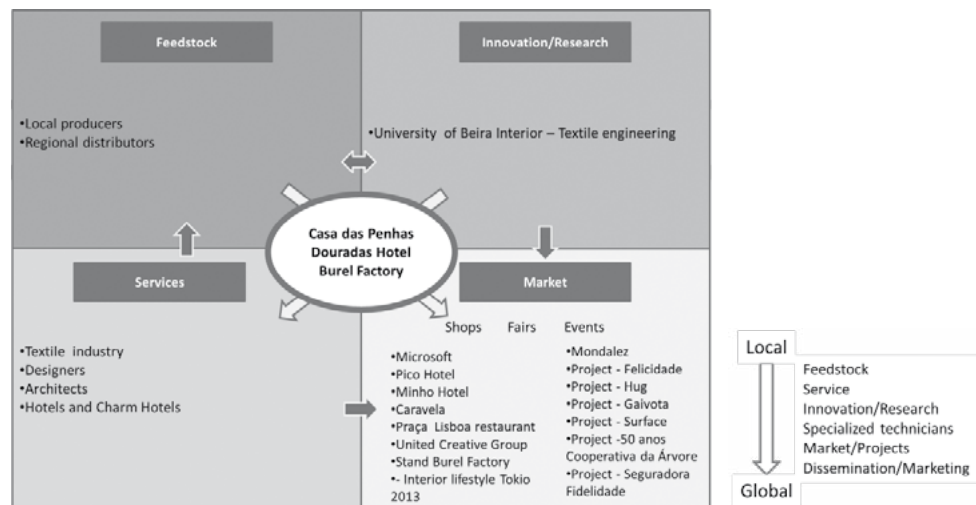
it begins a process of dissemination of the company and its products given each of the collaborators, not being involved on an exclusive basis and taking part in other projects (individual or institutionalized) ends up disseminating the concept and products of the Casa das Penhas Douradas and the Burel Factory in their professional exercise.

It is, in fact, in the context of the dissemination of the products and in a logic of marketing that the network is expanded and gains vaster Euclidian distances (Figure 9). On one hand through the stores were the production, not only from Penhas Douradas Food but mainly from the Burel Factory, reaches its target audience: in which the small factory and hotel stores evolved to a store in Chiado, Lisbon – *Loja da Burel* – and through export to a set of international stores, scattered through various countries: Netherland, Germany, Finland, Belgium, USA, China, among others. These spaces are joined by the virtual store.

Apart from those, there are occasional episodes of promotion of the hotel, factory and products, through participation in national and international trade fairs, events or product exhibitions. The brand Casa das Penhas Douradas/Burel Factory is, still, disseminated by the projects the company integrates in terms of the decorative and architectural dimension, by associating to a set of international acting companies, widening their networks by intermediaries of these partners.

We then verify a social innovation that breaks the traditional logics of low density territories (associated to isolation), for the adoption of network acting strategies and creation of partnerships which, at different scales and in several dimensions (Figure 10) turn the company more capacitated, given it are created multiple acting options while solidifying product export territories and service dissemination. At the same time, local and regional synergies are created, contributing to the reinvigoration of the economic and social structures, even backing the creation of more cohesive, competitive and, therefore, more resilient territories.

Figure 10 – Network elements of Penhas Douradas Hotel and Burel Factory: fields, dynamics and contributions of partnerships



Source: Own elaboration

Final considerations

In the last years, the understanding of the concept “resilience” requires the combined consideration of fundamental aspects (Pearson 2008): (1) persistence, referring to the capacity of a system to maintain the structure and function when confronted with shocks and change; (2) adaptability, associated to the collective capacity of people to learn and adapt to the change in conditions, aiming to achieve a desired status; (3) transformability, the capacity of people to innovate and transform in crisis periods, aiming to create a new socioecological system when the social and economic conditions become the existing system unbearable. This last aspect refers, for example, to the capacity of transforming the socioeconomic context of crisis in an opportunity to change and promote local economy.

The presented case study, based in the valorisation of endogenous products and local population, supported on an endogenous and exogenous knowledge (know-how), had the skill and capacity to learn, adapt and innovate, contributing to the valorisation of this territory and, thus, stimulating its capacity of resilience. It is, unarguably, an example of local entrepreneurship, where traditional products originated new productive combinations with refinement, elegance and wisdom.

However, if on one hand Casa das Penhas Douradas hotel and the Burel Factory constitute an element of increment of this territory’s resilience, from a socioeconomic perspective; on the other hand its dynamics is insufficient to subvert the regressive development trajectories that characterize the Manteigas municipality since several decades. At the level of human and social capital, the focus of the study and one of the main resilience elements, despite the efforts with expressive results in the requalification of human resources and social innovation, the company, on its own, is not a factor of fixation and demographic reconversion. Its main relevance arises at the level of employment: although only employing 40 workers, at a local level that contingent becomes an expressive number, mainly when realizing its inexistence could imply unemployment for that group of individuals. In fact, the company arises as an innovative and employing agent. Nevertheless, the non-convergence of other local businessmen in these entrepreneurial logics and innovation difficult large impacts in the local development trajectories. At the same time it is realized that it becomes a crisis impact minimizing agent (unemployment), given the population concerned, for its characteristics would tend to maintain in the municipality, despite the potential situations of prolonged unemployment.

In this sense, other projects/businesses that aim to use and maximize this region’s endogenous resources, able to trigger economic growth, aiming to retain the actors and increase the employment rate will be a cornerstone in the change of regressive trajectories and in boosting local development in these low density territories. Nevertheless, the multifunctionality and diversity here evoked has, still, not very positive reflections for there is no solid strategy that lifts endogenous products. The same happens at the level of territorial marketing strategies. There is a resistance of several projects that try to propel the mountain and make it a destination, but they are so much isolated that, even disseminated by media, they end up by having a residual expression in structural terms.

Acknowledgments

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References

- Adger, W., Neil, P., Kelly, M., Huu Ninh, N. (2001). *Living with Environmental Change: Social Vulnerability, Adaptation, and Resilience in Vietnam*. Rutledge, London, Reino Unido.
- Arnaez J, Lasanta T., Errea M. P., Ortigosa L. (2011). Land abandonment, landscape evolution, and soil erosion in a Spanish Mediterranean mountain region: The case of Camero Viejo. *Land Degradation & Development*. 22 (6): 537–550.
- Berkes, F. and Folke, C. (eds) (1998). *Linking Social and Ecological Systems. Management Practices and Social Mechanisms for Building Resilience*. Cambridge University Press, Cambridge, Reino Unido.
- Caeiro, J. (2009). *Políticas Territorializadas de Desenvolvimento em Contexto de Montanha: O Exemplo da Acção Integrada de Base Territorial da Serra da Estrela*. Dissertação de Mestrado. Faculdade de Letras da Universidade de Coimbra, Coimbra, Portugal.
- Caetano, L. (2003). Microempresas e desenvolvimento local. Caetano, L. (coord.). *Território, do global ao local e trajetórias de desenvolvimento*. pp. 151-183. CEG – FLUC, Coimbra, Portugal.
- Carrola, T. (2013). *Análise sistémica da manufatura e discursiva da imagem do queijo da Serra da Estrela DOP: Aplicação de metodologias projetuais à solução de pontos críticos*. Dissertação de Mestrado. Universidade da Beira Interior, Covilhã, Portugal.
- Covas, A. and Covas, M. (2014). *Os territórios-rede. A inteligência territorial da 2ª ruralidade*. Edições Colibri, Lisboa, Portugal.
- Cravidão, F. and Cunha, L. (1994). Ambiente e práticas turísticas em Portugal. *Inforgeo* nº6. Associação Portuguesa de Geógrafos, Lisboa, Portugal.
- Cunha, L. (2003). A Montanha do centro português: espaço de refúgio, território marginal e recurso para o desenvolvimento local. L. Caetano (coord.). *Território, Ambiente e Trajetórias de desenvolvimento*. pp. 175 – 191. CEG – FLUC, Coimbra, Portugal.
- Davidson-Hunt, I. and Berkes, F. (2003). Learning as you journey: Anishinaabe perception of social-ecological environments and adaptive learning. *Conservation Ecology*. 8(1): 5. Accessed in 20th of October 2015, on theWeb site of: <http://www.consecol.org/vol8/iss1/art5/>
- Fernandes, G. (2009). Áreas de Montanha e Turismo. Conflitos e complementaridades na apropriação do Território. *1º Congresso de Desenvolvimento Regional de Cabo Verde*. pp. 2969 – 2987. Cabo Verde.
- Freitas, M. and Esteves, A. (2012). Territórios resilientes, criativos e socialmente inovadores: desafios e paradoxos à transformação e mudança face a disrupções e processos com expressões difusas e diluídas no tempo. *VII Congresso Português de Sociologia*. 14 pp. Porto, Portugal.
- Gardner, J. and Dekens, J. (2007). Mountain hazards and the resilience of social-ecological systems: lessons learned in India and Canada. *Natural Hazards*. 41 (2): 317 – 336.
- Gilly, J., Kechidi, M., Talbot, D. (2014). Resilience of organisations and territories: the role of pivot firms. *European Management Journal*. 32 (4): 596-602.
- Granovetter, M. (1983). The Strength of Weak Ties: a Network Theory Revisited. *Sociological Theory*. 1: 201-233.
- Jacinto, R. and Alves, C. (2013). Refuncionalização dos espaços rurais de montanha: desindustrialização e turismo no concelho de Manteigas. In R. Jacinto, (coord.). *Paisagens, Património e Turismo Cultural*. Iberografias 24. Âncora Editora, Lisboa, Portugal, pp. 127 – 157.
- Longworth, N. (2006). *Learning Cities, Learning Regions, Learning Communities: Lifelong Learning and Local Government*. Routledge, New York, EUA

MacDonald D., Crabtree J., Wiesinger G., Dax T., Stamou N., Fleury P., Gutierrez Lazpita J., Gibon A. (2000). Agricultural abandonment in mountain areas of Europe: environmental consequences and policy response. *Journal of Environmental Management*. 59: 47–69.

Nunes, A. (2008). *Abandono do espaço agrícola na “Beira Transmontana*. Iberografias 13. Ed. Campo das Letras SA, Porto, Portugal.

PDT_ *Programa Territorial de Desenvolvimento da NUT III Serra da Estrela*, 2007. Disponível em: http://www.maiscentro.qren.pt/private/admin/ficheiros/uploads/PTD_SERRA%20DA%20ESTRELA.pdf

Pearson, L. (2008). Applying resilience thinking for sustainable development. ECOS. Accessed in 20th of October 2015, on the Web site: <http://www.sciencealert.com.au/features/20082304-17227.html>.

Pratt, A. (2015). Resilience, locality and the cultural economy. *City, Culture and Society*. 6 (3): 61-67.

Sánchez-Zamora, P., Gallardo-Cobos, R., Ceña-Delgado, F. (2014). Rural areas face the economic crisis: Analyzing the determinants of successful territorial dynamics. *Journal of Rural Studies*. 35: 11 – 25.

Santos, F. (2009). *Territórios resilientes enquanto orientação de planeamento*. Direção de Prospectiva e Planeamento, Lisboa, Portugal.

Santos, F. (2011). *A resiliência enquanto orientação de planeamento regional. Uma abordagem integrada e aplicada à região do Alentejo*. Dissertação de Doutoramento. Universidade Nova de Lisboa. FCT – Univ. Nova de Lisboa, Lisboa, Portugal, 273 pp.

Saraiva, D. (2012). *Lazer, Turismo e Desenvolvimento local em território de montanha – O exemplo do concelho de Manteigas*. Dissertação de Mestrado. Faculdade de Ciências do Desporto e Educação Física da Universidade de Coimbra, Coimbra, Portugal, 145 pp.

Silva, S. (2009). *A Estância de Férias das Penhas Douradas*. Prova Final de Licenciatura em Arquitetura. Departamento de Arquitetura da Faculdade de Ciências e Tecnologias da Universidade de Coimbra, Coimbra, Portugal, 177 pp.

CHAPTER 6

The Uses of Knowledge in the Hospitality Industry: Three Case Studies in the Algarve

Bernadete Dias Sequeira

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Introduction

The progressive growth of the tertiary sector, since the 1950s, was the result of a great technological development that increased mechanization and automation in industrial production. This, not only liberated manpower, but led to important changes in management culture. In the late 1990s, in Western countries, the tertiary sector largely overtook other sectors of the economy.

The technological development that occurred in this period triggered several changes in society and the economy. One of these changes concerned the new ways of processing and handling large volumes of information that became exponentially greater than those of former times. Information and knowledge assumed a central role in the economy, in particular in relation to capital, raw materials and even labor.

Daniel Bell (1973), describing what he called the “post-industrial society,” refers to the transition from a commodities production-based economy toward an economy where services are increasingly important. In this scenario, knowledge and information become the catalysts of innovation and social change and form the array of ideas that inspire the whole of society. Labor and capital tend to be supplanted by information and knowledge, which become the central variables of the economy (Kovács, 2002) and the political processes for their control become increasingly evident. Expressions like “information society” and “information and knowledge society” are increasingly popular (Freire, 2001).

As Peter Drucker puts it, “in this society, knowledge is the primary resource for individuals and for the economy as a whole” (Drucker, 1996, p. 78). That is why he also calls this knowledge society a “society of organizations.” The purpose and function of each organization, whether corporate or not, lies in the integration of expertise in its operations (Drucker, 1996).

Knowledge management emerged, thus, within the framework of scientific thought on organizational management, from the necessity of using and combining multiple sources and types of organizational knowledge in order to promote the development of specific skills or innovative capabilities that could give rise to new products, new processes and to leadership of the markets (Nonaka & Takeuchi, 1997).

Nowadays, rationalization of the use of resources and the improvement of service efficiency puts an enormous pressure on all organizations, either public or private, not excepting, of course, tourism organizations such as travel agencies or hotels. These frequently face significant challenges for modernization and streamlining of the services they provide. The creation of

appropriate mechanisms that allow them to achieve their goals requires not only the improvement of work processes, but the dedicated management of people and their knowledge.

Knowledge Management in the Hospitality Industry

Tourism is one of the most significant features of contemporary global society; a phenomenon that directly or indirectly affects a significant part of the world's population (Vieira, 1997). Tourism is one of the economic activities with a higher propensity for growth and expansion. It has impacts that range from the social, cultural, economic, and environmental levels to the organizational level (Melo, 2005).

Knowledge management in the tourism sector, particularly in the hotel industry, is of critical importance due to the fact that the main features of the services they provide are *intangibility*, *perishability* and *heterogeneity*. Hotel services are characterized by their *intangibility* because, after their use, the customer only retains his own perception and/or satisfaction. Hotel services are also characterized by the *simultaneity of production and consumption*, as the service occurs when it is used by the customers, often produced in their very presence. This requires a great accuracy and constant attention to the quality of the service provided. The hospitality industry is also characterized by the great *heterogeneity* of the services offered. Hotels systematically seek to meet the needs and desires of their customers, constantly offering new products and services. Another feature is the impossibility of storing the product: if, on a given night, a room is not occupied, this implies that the income from its occupation has not been realized (Costa, 2008).

In addition, as Eiglier (1991, cited by Costa, 2008) puts it, in the hospitality industry, the human and technical qualities of the personal are an integral part of the services provided, the physical characteristics of the hotel being only a part of the whole system that it represents. Zaei (2014) argues that the work in tourism and hotel management greatly depends on how the workers use their knowledge in order to provide the best possible experience for customers. For this reason, it is of critical importance that tourism organizations in general and the hospitality industry in particular develop a knowledge management approach that enables them to retain highly skilled staff and keep customers satisfied.

However, the hospitality industry has lagged behind in relation to knowledge management practices already implemented in other sectors. Hallin and Marnburg (2008), quoting researchers in the field of tourism, pointed out the main reasons that explain the scarcity of research and practice of knowledge management in tourism and hospitality organizations. According to these researchers: i) in the literature, the concepts of knowledge management are mainly developed from a multinational perspective (for example, Nonaka & Takeuchi, 1995) and do not take into account many aspects of tourism services and don't have an inter-organizational perspective (Grizelj, 2003); ii) tourism researchers and knowledge management researchers must change their traditional focus from studying organizations individually and begin to integrate different organizations in their studies (Cooper 2006); iii) in relation to tourism, knowledge management needs to incorporate inter-organizational issues such as knowledge stocks and flows (Davidson & Voss 2002); iv) the frequent lack of application of scientific knowledge in tourism organizations' management prevents debate on the virtues of knowledge management

(Grizelj, 2003); v) the published research on knowledge management in tourism and hospitality organizations is frequently too descriptive, often inconclusive and very limited (Ruhanen & Cooper, 2004). In addition, according to Ruhanen and Cooper, the tourism sector is dominated by small- and medium-sized enterprises which are traditionally averse to scientific research. As a result, research in the area has hardly addressed the issue of knowledge management (Ruhanen & Cooper, 2004).

According to Bouncken, the quality of the service in a hotel depends heavily on its ability to acquire, develop, collect and distribute knowledge (Bouncken, 2002). Research into knowledge management in the hospitality industry therefore could enable these organizations to adopt knowledge management processes in their day-to-day activities and increase their capacity for organizational learning (Zaei, 2014).

Emergence and Conceptualization of Knowledge Management

The emergence of knowledge management

The subject of knowledge management is relatively recent. Karl Wiig is attributed as the creator of the term in 1986¹ (Liebowitz & Beckman, 1998). During the 1990's, some companies such as Xerox, British Petroleum, and World Bank as well as some consulting firms such as Arthur Andersen, Ernest & Young, KPMG and PriceWaterhouseCoopers implemented knowledge management practices. The consultants working for these companies reported and published their first experiences in this period. Thomas Davenport, for instance, revealed his experiences in various companies, such as Microsoft, HP, IBM, Ernest & Young, and Teltech (Stollenwerk, 1999). Nonaka, in 1991, published one of the first scientific papers on knowledge management in the *Harvard Business Review*. In 1993, Karl Wiig published one of the first books on the subject, entitled *Knowledge Management Foundations*. In 1994 the first conference on knowledge management took place (*Knowledge Management Network*). Two years later, Nonaka and Takeuchi published the book *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*, a pioneer study on the creation and use of knowledge in Japanese companies (Davenport & Prusak, 1998). In 1995, Dorothy Leonard-Barton published her book *Wellsprings of Knowledge*, where she explains in detail the role of knowledge in industrial enterprises (Davenport & Prusak, 1998). In this time, many books focusing on this subject appeared. Companies such as Dow Chemical and Skandia, consultants McKinsey, Ernst & Young, and IBM Consulting appointed supervisors for knowledge resources, designating them *knowledge managers or directors of intellectual capital* (Davenport & Prusak, 1998).

According to Leonor Cardoso (2003) it is possible to distinguish three theoretical orientations on the knowledge management approach. First, there is the contribution of Nonaka who, starting from the Japanese organizational context, emphasizes the knowledge creation processes as well as the distinction between tacit and explicit knowledge (Nonaka, 1991, 1994;

¹ Karl Wiig was the first author who used the term "knowledge management" at a conference of the *International Labor Organization (ILO)*, in Switzerland.

Nonaka & Takeuchi, 1997; Nonaka, Toyama, & Konno, 2000; Nonaka, Toyama, & Nagata, 2000). The second has earned more attention from European authors and focused the evaluation of the knowledge resources (Kaplan & Norton, 1992, 1997; Edvinsson & Malone, 1997; Stewart, 1997; Sveiby, 1997). The third theoretical approach focuses on the role of technology as a tool to support the processes of the creation and management of knowledge. This perspective tries to understand how organizations extract, structure, encode, store, retrieve, and apply individual, group and organizational knowledge. In this approach, the contributions of American authors (such as Davenport & Prusak, 1998) are very relevant since they emphasized the way technology platforms may stimulate and optimize interactive management (Cardoso, 2003).

To McElroy, the “first generation of knowledge management” was based on the assumption that organizations hold valuable knowledge, the management of which is strongly supported by technology, and focuses primarily on its capture, encoding, and sharing. The “second generation” assumes that, before the capture, encoding, and sharing, knowledge has to be created, so knowledge management focuses on what people need to create new knowledge, without neglecting, of course, the use of technology (McElroy, 1999, 2003). This vision is close to Nonaka’s, for whom knowledge management relates to the organization’s ability to create, disseminate and incorporate new knowledge in their processes, products, and services. This creative ability depends on the action of individuals and groups (Nonaka & Takeuchi, 1997).

Conceptualization of knowledge management

In the context of the organizational theories, knowledge management is seen as a process that promotes the development, innovation, and strengthening of competitiveness in organizations. From this perspective, knowledge management consists basically in the management of the context where knowledge is created (Nonaka & Konno, 1998).

To Wiig (1997a, 1997b, 2004), knowledge management is the systematic, explicit, and deliberate management of knowledge and the promotion of its creation, construction, renovation, and application in order to maximize the effectiveness of the organization’s knowledge.

According to Liebowitz (2001), knowledge management consists in the process of enhancing the intangible assets of an organization. It is about taking advantage of the internal and external knowledge about customers and stakeholders, that is, the best way to share knowledge in order to create value and add benefits to the organization (Liebowitz, 2001).

Karl Sveiby (1998) specifies that knowledge management is the ability to create value from the intangible assets of an organization, these being:

- the *competence of the employees*, which Comprises their capacity of action in different situations in order to create tangible and intangible assets;
- the *internal structure*, which consists in the flow of knowledge within the organization (patents, concepts, information systems, and administrative models created by the employees or purchased externally); and

- the *external structure*, which includes relationships with customers and suppliers, with the trademarks, the image and reputation of the organization itself and also involves sales activities, public relations, marketing, etc. (Sveiby, 1998, pp. 11–12).

Therefore, knowledge management is the “process by which the organization generates wealth, from its knowledge or intellectual capital” (Bukowitz & Williams, 2002, p. 17). This wealth results from the use of knowledge in order to create more efficient and consistent processes that have positive impacts on the financial results, in the creation of value to the client, and in the innovation and promotion of exclusive market offers. It is expected from knowledge management, the development and application of the intellectual capital (tacit, explicit, and embodied knowledge) in order to help the organization to achieve its goals, would these be the quality of its services and products or its long-term profitability and viability (Wiig, 2004).

According to Terra (2003), all organizations manage their knowledge somehow, because human work is not conceivable without the use of intelligence. Work processes always reuse knowledge to produce and to correspond to the clients’ demands. Knowledge management has a universal character, since it occurs in organizations belonging to a diversity of sectors: from traditional to cutting-edge areas, from primary sector organizations to industries or services (Terra, 2001). In fact, this author prefers to speak about knowledge management initiatives rather than about a knowledge management project. In his own words,

Who can say that training, e-learning, brainstorming practices outside the company, implementation of software for content management, document searching, CRM² or corporate portals, stimulating the formation of communities of practice, patents, encouraging the sharing of knowledge, etc. is not about knowledge management? (Terra, 2003, p. 168).

With this line of thought Zheng, Yang, and Mclean (2010) argue that knowledge management consists in the efforts made in order to facilitate the activities of acquisition, creation, storage, sharing, dissemination, development, and implementation of knowledge by individuals and groups. Creation of knowledge consists in both its acquisition by the organization through external sources, and in the internal processes of creation. The sharing of knowledge, also referred to as its “transfer” or “diffusion”, refers to the process by which knowledge is transferred from one individual to another, from individuals to groups, or between groups. The use of knowledge, also called application or implementation, refers to its use in concrete everyday organizational life (Zheng et al., 2010).

For Cardoso, knowledge management is “the creation and development of internal organizational conditions that catalyze all processes related to knowledge (its creation/acquisition, sharing/dissemination, storage, retrieval, use, etc.) in order to achieve the objectives of the organization” (Cardoso, 2003, p. 186). It consists in a set of everyday activities concerning the development of organizational conditions that enhance all the processes related to knowledge as an essential resource for the achievement of the objectives of a given organization (Cardoso, 2003, p. 199).

² Customer Relationship Management.

The use of Knowledge as a Dimension of Knowledge Management

The primary purpose of knowledge management is the use of knowledge for the benefit of the efficiency of the organization (Cabrita, 2009). To apply organizational knowledge means to mobilize it in decision-making, in task accomplishment, in problem-solving, in the search for new ideas, and in learning (Liebowitz & Beckman, 1998).

At this stage the creative and innovative use of knowledge plays a critical role in the effective creation of value for the customer or user. Innovation thus becomes the heart of the matter, revealing itself in the creation of alternative solutions. Regardless of the reasons that create it, innovation is always an adaptive behavior that allows the organizations to maintain or improve their performance (Damanpour, Walker, & Avellaneda, 2009).

In the literature, there are fundamentally three major classifications of innovation (Camisón, Lapedra, Segarra, & Boronat, 2003). The first emphasizes the technical or technological innovation and the organizational or *administrative innovation* (Daft, 1978; Damanpour, Fariborz, & Evan, 1984; Camisón & Monfort-Mir, 2012). *Technological innovation* is obviously the result of the introduction of new technologies in products or processes (Damanpour & Evan, 1984). Normally this kind of innovation is associated with change of the “technological core” or the “technical system” of the organization. Technological innovations are directly related to the main activity of the organization, and their introduction will eventually produce changes in the products, processes, operating systems, and physical capital of production (Camisón-Zornoza & Monfort-Mir, 2009; Camisón & Monfort-Mir, 2012). Organizational innovation consists in the introduction of novelties in the management methods, in the ways of organizing work, or in the business model (Julián, 2009). This type of innovation normally represents a new approach in the scope of the “administrative core” or in the “social system” of the organization. It consists in the implementation of new practices in human resource management, in the structure and organization of work and in the relation with the external environment, namely with customers, markets, suppliers, and competitors (Damanpour & Evan, 1984; Camisón & Monfort-Mir, 2012). Organizational innovation is then directly linked to the organization’s management and indirectly to its basic activities (Damanpour et al., 2009; Camisón-Zornoza & Monfort-Mir, 2009; Camisón & Monfort-Mir, 2012). The organization’s performance depends on a balanced adoption of the two types of innovation (Julián, 2009).

The second classification, *technological innovation*, distinguishes *product innovation* from *process innovation* (Tidd, Bessant, & Pavitt, 2003; Hameed, Counsell, & Swift, 2012). Product innovation corresponds to the introduction of new products and services. In turn, process innovation corresponds to the introduction of new elements in the sphere of tasks, decision-making, and information systems, or at the level of production or provision of services. Frequently, process innovation is less visible than product innovation, but sometimes the distinction between them is very tenuous. Services constitute a paradigmatic example of how an innovation can be at the process level and at the product level at the same time. For instance, a new vacation package constitutes a change in the product and in the process (Tidd et al., 2003).

The third innovation classification is split into *incremental innovation* and *radical innovation* (Camisón et al., 2003; Tidd et al., 2003). Radical innovation causes fundamental changes in the dominant practices and in the knowledge available in a given organization or industry (Camisón

et al., 2003; Silva, 2004), it changes the way its members think and act (Tidd et al., 2003). Incremental innovation, by contrast, consists in gradual changes in the usual practices (Camisón et al., 2003). Jansen, Van Den Bosch, and Volberda (2006) refer to these two types of innovation using the terms *exploratory innovation* and *exploitative innovation*, respectively.

The capacity to innovate of a given organization depends on its dynamic capacity³ which is formed by the values held by its members, their know-how, tacit knowledge, and their ability to apply new knowledge in the development of new products and processes (Julián, 2009, p. 157).

Notwithstanding, there are several obstacles to the use of the new knowledge and innovative procedures, namely mistrust regarding the source of the new knowledge, pride and stubbornness, lack of time, lack of opportunity, and the fear of taking risks. People tend to resist any changes that require dropping any of their previous skills because they usually believe that those skills identify them professionally, assuring them of their well-being at work.

Organizations may provide the means to enhance creative thinking, but more important than this is to promote an environment in which creativity, experimentation and openness to new ideas are stimulated (Bukowitz & Williams, 2002).

Decision-making has changed: it is no longer the exclusive domain of senior executives to become a distributed domain by line managers. However, sometimes, the flow of information is not distributed equally. For the use of knowledge to be effective it is important to think of information as a resource that flows freely throughout the organization (Bukowitz & Williams, 2002).

Freedom to act with creativity opens up the possibility for the invention of new solutions that provide new and better results. “When people are able to think differently the understanding of how the organization creates value becomes multifaceted instead of restricted” (Bukowitz & Williams, 2002, p. 127). It is clear that an increase in participation can lead to an increase in “noise.” Confusion increases, requiring further efforts in the selection of contributions. However, the potential emergence of new and good ideas also increases. In this process of fostering creativity it is essential to create space and to set a time for experimentation (Terra, 2001) in order to allow the creative ideas to flourish without disturbing the functioning of the organization. There are organizations that establish formal processes to encourage suggestions for improvements, and standardized processes for feedback about the results of creative ideas, innovative actions, and the sharing of knowledge, through public recognition or even the award of prizes.

In these processes, the application of knowledge may result in the identification of new ways to exploit it, leading to a new cycle of creation of knowledge (Nonaka & Takeuchi, 1997). With this line of thought, Serrano and Fialho (2003) argue that organizations have as their primary function the organization of existing knowledge, making it applicable, and the creation of new knowledge, with the objective of enhancing their performance. In this way, success depends on the transformation of existing knowledge in the field of ideas, and employment of knowledge through actions (Serrano & Fialho, 2003).

³ Dynamic capacities are understood as the organizational capacity to effectively integrate, adapt, renovate, reconfigure, and transform its assets as well as its external resources (Teece, Pisano, & Shuen, 1997; Teece, 2007), in order to respond to changing situations. Innovative capacity means the capacity to integrate and make decisions about technological, cultural, and organizational features that encourage learning, creation, and application of knowledge (Camisón-Zornoza & Monfort-Mir, 2009).

Table 1 – Use of knowledge activities

Use of knowledge activities	Authors
Innovation of processes, products, and services	Nonaka & Takeuchi, 1997; Wiig, 2004; Julián, 2009; Cabrita, 2009;
Autonomy for decision-making	Liebowitz & Beckman, 1998
Encouraging creativity and receptivity to new ideas	Bukowitz & Williams, 2002
Encouraging experimentation	
Free movement of information	

Source: Own elaboration

Research Methodology

In the research, the main results of which are presented in this chapter, we opted for a multiple case-study approach since we intended to thoroughly understand the processes of knowledge management in hospitality organizations. Therefore, it was considered important to study various cases of hotel chains – through the use of the “literal replication” criterion (Yin, 2005) – with the purpose of making comparisons that would allow a more in-depth understanding of the reality of this type of organization. Thus, each case study corresponds to a hotel group, which in turn is composed of several sub-units: the hotels where data was collected. The research presented may thus be considered as an embedded multiple case-study of descriptive character.

For reasons of anonymity and confidentiality, the studied hotel groups will be designated as follows: Group A (nine hotels), Group B (six hotels) and Group C (one hotel). Groups A and B are two of the main hotel chains operating in Portugal, and Group C is a multinational company in the hospitality sector and one of the most prestigious international hotel chains.

Data collection techniques

When studying the dynamics of complex organizations and, simultaneously, the practices of the people who compose them, the quantity and diversity of data to be analyzed is often too big. Bearing this in mind, we decided to use a two-step methodology comprising two main techniques of data collection: semi-structured interviews and a survey.

In the first step, the interviewees were selected on the basis on their position, experience, and knowledge about the industry. The interviews were essentially addressed to directors with the purpose of understanding in depth the policies and practices of knowledge management in the hotels in which they worked. In Group A, seven interviews were conducted with five general directors of hotels (designated by DH-A1, DH-A2, DH-A3, DH-A4, and DH-A5), the director of human resources (DHR-Group A) and the director of informatics for the Algarve (DIA-Group A). In Group B, six interviews were conducted: three directors of hotels (designated by DH-B1;

DH-B2, B3, B6; and DH-B5)⁴, an assistant director (designated by AD-B4), the director of human resources (DHR Group B) and the director of information systems (DIS-Group B). In Group C, three interviews were conducted: the general manager of the hotel, designated by DH-Group C, the director of human resources (DHR-Group C) and the person responsible for information systems (RIS Group-C).

Table 2 – Sample of semi-structured interviews

Informants	Group A	Group B	Group C
General manager of the hotel	5	4	1
Director of human resources	1	1	1
Responsible for information Systems	1	1	1

Source: Own elaboration

The second step of the study involved gauging the opinions of the real users of the organizational knowledge, i.e., the staff that truly implement the management policies through their daily practices. Considering the size of the universe, we opted for an extensive approach and therefore a quantitative perspective. Through a random sample, we intended to identify the opinions, attitudes, and practices of staff in relation to organizational knowledge.

Through lists of staff provided by the hotels, a random sample stratified by professional category and by area of service was defined for each group (with a sampling error of 3%), as presented in Table 2. Thus, the elements of the population have been organized by strata according to the main activity areas of the hotels, each of these strata representing a random sample proportional to the population (Marconi & Lakatos, 1999).

Table 3 – Stratified sampling of the study

	Sample strata	Universe analysis	Sample	Valid responses
Group A	F&B (Food & Beverages)	253	160	97
	Accommodation	227	143	114
	Other Services	118	74	50
	Total	598	377	261
Group B	F&B	152	114	55
	Accommodation	122	91	59
	Other Services	89	67	53
	Total	363	272	167
Group C	F&B	32	28	22
	Accommodation	51	45	11
	Other Services	63	56	33
	Total	146	129	66

Source: Own elaboration

⁴ It should be noted that one of the interviewees is the director of three of the group’s hotels in the region: (DH-B2, B3, B6).

Analysis and interpretation of data

Data interpretation and analysis is one of the most complex stages of any research process since it is a crucial stage in the reconstruction of the meaning of the information collected. Given the extent and diversity of the collected data, it is important to keep in mind what Miles and Huberman (1994) have called the “data analysis overall strategy,” which provides the general framework of data analysis. This investigation sought to keep a careful articulation between data collection techniques and analysis.

Data collected through the interviews was recorded, organized, and then thematically analyzed through qualitative data analysis software NVivo 9. Data obtained through the survey was analyzed using the computer package SPSS 21. The responses were first coded and entered into the computer program, and then statistically analyzed. Then, the combination and comparison of the different types of gathered information was carried out.

The use of Knowledge in Hospitality

The case of Group A

After locating and obtaining knowledge, the organization faces the challenge of using it effectively in work situations. Creative use of knowledge is of great importance for the emergence of alternative and more efficient solutions; innovation is a central issue in organizational life.

When asked if the staff of the hotel group is encouraged to innovate, the respondents emphasized the ongoing process of repositioning the brand that began in 2008. Back then, this group created a new concept based on tourist experiences, which became its trademark. This concept is based on the offer made to the clients of a diversity of experiences, both within and outside its hotels. The implementation of this change has triggered a series of innovation processes in terms of products and services. According to the respondents, this gave place to an environment in which workers were constantly challenged to innovate and find new solutions.

We are known by the market for having, in the past four years, repositioned the brand, which was already old and spent. So, we made an update to our brand an aggiornamento and that led to innovation processes. ... At this stage, our group won this year's Portugal Tourism award for the best service, through a component of innovation that we put into practice. It was the experiences thing. "Look, come on and try other things, have new experiences!" That attitude led the hotels of the group to create their own experiences. It led, for instance, to the establishment of a partnership with the company A Vida é Bela for the distribution and selling of the experiences we developed. It led to online selling, etc., etc. (DH-A4 Group A).

In our group [to innovate] is not only possible, but is stimulated. The constant challenge is that we have to innovate. We have to find new solutions and to be always changing things. This constantly challenges us and, at certain times, leads to a great disorganization, but after, it has very positive effects. It gives us important opportunities for development and growth (DHR-Group A).

The interviewees emphasized the importance of the meeting of the Committees⁵ where new ideas are transformed into new products and new services. As the director of human resources explains,

[The Committees] are much related to the implementation of many of the products that resulted from innovation. Because what these forums do is to operationalize the concepts (DHR-Group A).

The director of the hotel (A4) stated that, in his hotel, the Safety & Hygiene Committee function has a kind of “nursery,” innovating and experimenting in his area. He expects this methodology to expand toward other areas of the hotel.

Taking into account that several authors refer to the stimuli of creativity as one of the ways to promote the use of knowledge in organizations, our interviewees were asked about the incentive to be creative in their hotels, namely, if there are occasions when people can communicate their ideas and submit their suggestions and if these are effectively implemented and acknowledged. At the time of the fieldwork, Group A had no formal program to collect suggestions, yet there are certain formal occasions when the staff can present their suggestions: during committee meetings and other meetings, through questionnaires addressed to staff, through a suggestion box and during meals with the director. Informal situations were also mentioned as privileged ways of exchanging ideas.

According to the general director of hotel A5, the presentation of suggestions varies from hotel to hotel but, usually, there are regular meetings at all levels of the hierarchy, from general meetings to department meetings, and meetings between the directors of the departments and their teams, etc. and in all of them, employees are given the opportunity to submit suggestions.

In the daily life there are several leadership meetings in each of the departments [during which occur] the exchange of opinions and in which people communicate freely. Every chance of improvement suggested, no matter by who, is taken into consideration (DH-A5 Group A).

Daily briefings with the headmen of the various operational areas, which allow the exchange of suggestions and good practice, were also mentioned by the director. The annual staff survey, to collect opinions on issues such as working conditions and remuneration, also includes space for collecting improvement suggestions. During the meetings of the Committee of Accommodation, F&B and Purchasing⁶ there is always an item on the agenda dedicated to innovation and creativity and to the evaluation of suggestions. There are also some initiatives that are specific to each hotel. For example, the General Director of Hotel A4 says that in his hotel there are several ways to interact with the staff. The staff is represented on the Committee on Safety, Hygiene, and Working that has formal meetings with management on a monthly basis.

⁵ Working teams composed of staff from different functional areas.

⁶ The Housing Committee, the Committee of Food & Beverages and the Purchasing Committee are working groups constituted by the Directors of the areas, by the managers and by other employees who chosen depending on the themes worked.

As these four people [belonging to the Committee of Safety, Hygiene and Working] are friends, they can talk to everyone with less formalism These people talk to us and we seek to match their requests. We publish this on RH Positive, a billboard in the staff's restaurant. We want people to realize that the things are moving and that there is something concrete being done with their suggestions (DH-A4 Group A).

In the staff restaurant of hotel A2, there is a suggestion box where staff leave ideas that are later evaluated and eventually implemented. In the same hotel, there are specific occasions where the representatives of each section present their colleagues' improvement ideas to the director.

Each section chooses an employee to have lunch or breakfast with me. For half an hour, this employee can talk with me, ask me questions, present ideas, his or other's It's usually a section per month (DH-A3 Group A).

In this group of hotels, new ideas can also be informally presented. According to the results of the questionnaire addressed to the staff, this seems to be the main form of communicating improvement ideas and suggestions. The majority of the staff survey (80%) said that, when they have an idea or suggestion, they would talk to their immediate superior; 14.6% of respondents reported they would rather talk to the colleagues who represent them at the meetings. It should be noted that only about 5% indicated they chose not to share their improvement ideas with anyone.

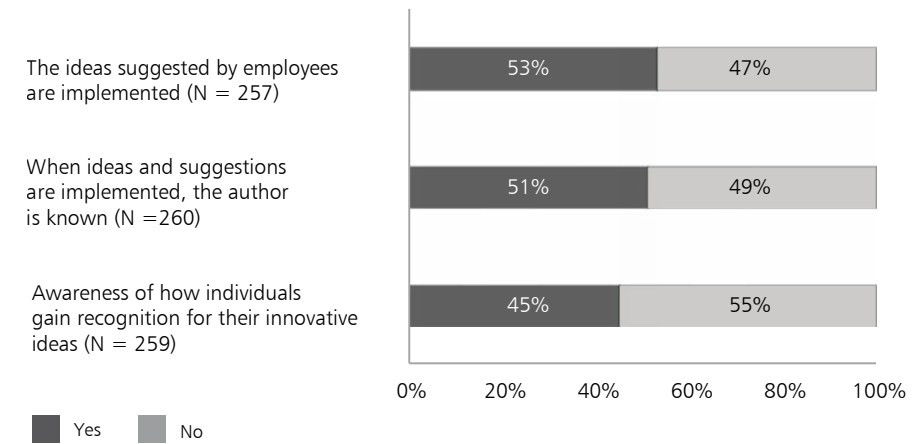
According to the majority of the survey respondents, there is a clear concern of the management in implementing the suggestions proposed by the workers after a prior assessment. Usually, when the suggestions concern the hotel group as a whole, they are approved by the Board of General Directors.

This Board stays below the Executive Management and includes the Regional Directors, the Finance Director, The Sales & Marketing Director, The Human Resources Director, the Quality Director and the General Director it meets on a monthly basis. That's where all the decisions about suggestions concerning all the hotels are made (DH-A5 Group A).

Although Group A does not have a formal reward practice for the implemented ideas, the General Director of hotel A5 considers that, in one way or another, the staff are ultimately rewarded.

In this group, there is some concern to publicly recognize the authors of new ideas – namely through the dissemination of these ideas and through the association of the authors' names and their ideas – although this concern is not always recognized by the staff. In what concerns the implementation of innovative ideas and their recognition, the staff opinions diverge. On the one hand, approximately 50% considered that the ideas suggested by the staff are effectively implemented and that the author is made known. On the other hand, the remaining 50% of people thought exactly the opposite (Figure 1). It should be noted that 55% of the respondents reported that they were not aware how contributors were recognized for the presentation of an innovative idea. The discrepancy of opinions on these issues shows that the enterprise's policies regarding creativity and its recognition are still not sufficiently clear to the staff.

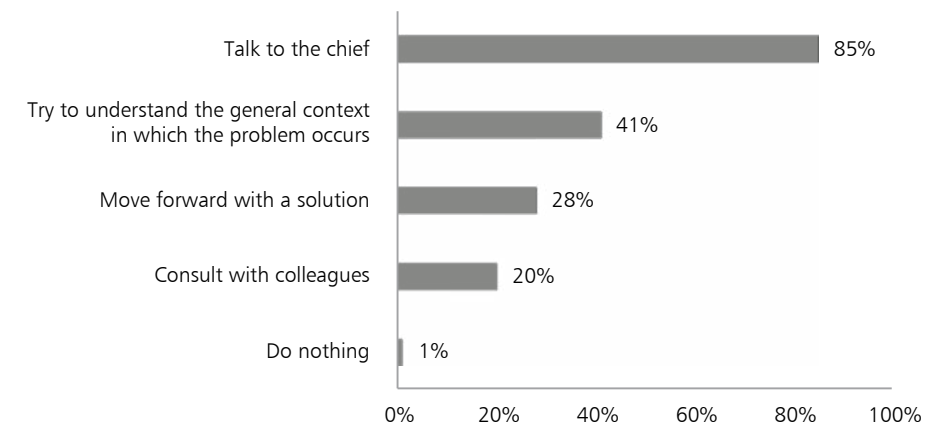
Figure 1 – Encouraging creativity: Group A



Source: Own elaboration

The use of acquired knowledge occurs in the execution of tasks, in decision-making and, of course, in solving problems (Liebowitz & Beckman, 1998). In this sense, workers were asked about what they would do when faced with a problem in the course of their duties. Looking at the data from the questionnaire (Figure 2) we can see that the majority (85%) said that they would speak to their immediate superior, 41% try to understand the general context in which the problem occurs, 28% stated that they would try to find a solution, while 20% would consult with colleagues. The data reveals that that everyday problem resolution still tends to be left to the upper levels of the hierarchy.

Figure 2 – Procedure before a problem (N = 216): Group A



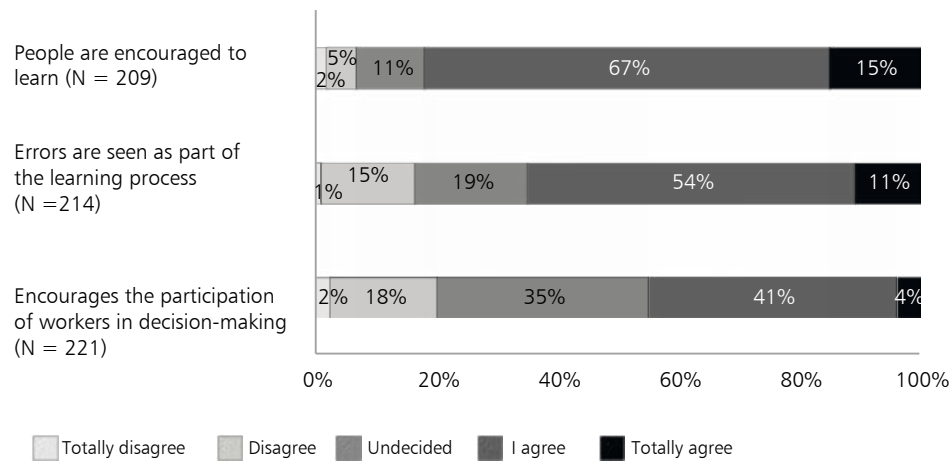
Source: Own elaboration

When asked about the organizational learning stimulus, three of the interviewees belonging to Group A considered that learning is effectively stimulated. According to the director of human resources, the organization's members are very sensitive to and aware of the need to constantly update and, therefore, learn. The general director of hotel A3 gave concrete examples of Group A's learning incentives:

For instance, the head of reception asked for a meeting room for tomorrow because his team has some new elements and he wants to meet with them to discuss some of the section's issues and to challenge them to go beyond. Typically, each person has their own form of organization, each headman has their way to communicate and to pass the important information and knowledge to people. So this is not static (DH-A3 Group A).

The general director of hotel A1 considers recognition as a fundamental issue in encouraging people to do their best: "the more knowledge they bring to the company, the more they are recognized" (DH-A1 Group A). According to the interviewees, the stimulus for learning is made through the promotion of participation in learning processes, and through the recognition of the workers. In the opinion of the workers themselves, 82% agree that they are encouraged to learn. A less significant majority (65%) agree that mistakes are seen by the organization as part of the learning process, however, only 45% of them agree that the organization encourages employee participation in decision-making. It should also be noted that a significant number (35%) is undecided on this issue, as illustrated in Figure 3.

Figure 3 – Stimulate the use of knowledge: Group A



Source: Own elaboration

The case of Group B

In Group B, innovation results fundamentally from experimentation with new procedures coming both from inside and outside the group. On the one hand, innovation comes from experimentation with initiative which have proved successful in several of the group's hotels. On the other hand, unsuccessful experiences in hotels not belonging to the group are carefully observed. Sometimes those "bad ideas" are rethought and eventually implemented in the group. Group B thus innovates from their own experimentation and also learns from others' failures.

[Innovation] will arise by the experiences of the past. Because if something went well in a given hotel, we may try it in this one. If an employee that worked in another group found something with potential for us, we'll try it. If things go really well, we continue, even if things don't go well at the first time, we persist (DH-B1 Group B).

With regard to the incentives for creativity, we tried to find out how these organizations stimulate and disseminate the ideas of their employees and how they recognize and implement their suggestions. At the time of the fieldwork, Group B didn't have any formal program for collecting suggestions. However, there are opportunities during which workers can submit their suggestions. These include the weekly and monthly leadership meetings, the annual general meeting, as well as in periodic surveys about the social climate of the hotel and about hygiene and safety at work. Workers can also convey their suggestions directly to the director of the hotel either in an informal way or when they are asked for new ideas in the context of certain specific initiatives.

We have weekly meetings during which each department gives its feedback with some improvement suggestions or criticisms, and we tried to put it all together (DH-B5 Group B).

When I walk around in the hotel, I pass the kitchen, the pantry, the floors, the gardens, the swimming pool, etc. and I listen to them [the workers]. They see me and they came to me because it's the only way they can speak to me, because they don't come to the meetings, their leaders come to the meetings (DH-B5 Group B).

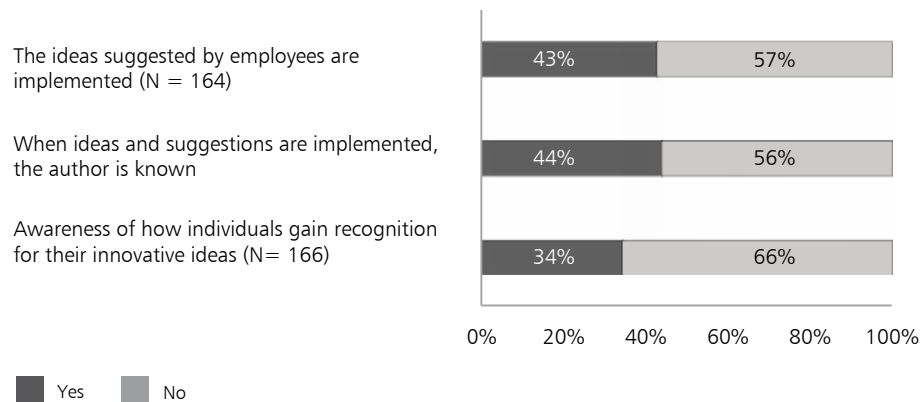
The survey data indicates that the workers tend to transmit their improvement suggestions essentially to their superiors. The majority (89%) state that they speak to the superior when they have a new idea or suggestion, and only 10% say they would rather speak to colleagues who represent them in the meetings to communicate their ideas.

The respondents stress that in this organization implementing staff suggestions following a preliminary evaluation is felt to be important. However, recognition of these ideas consists of a mere thank you to the author and its dissemination on the intranet.

I shouldn't be telling you this but unfortunately, if a person submits a good idea, the acknowledgement is only: "Good idea, thank you!" (DH-B5 Group B).

With regard to the implementation of innovative ideas and their recognition, 57% of the respondents reported that the ideas suggested by the workers are not implemented by the organization. A similar percentage (56%), believed that, even when ideas are implemented, no one gets to know who suggested them. It should be noted that 66% of respondents do not know how innovative ideas should be recognized, as shown in Figure 4.

Figure 4 – Encouraging creativity: Group B

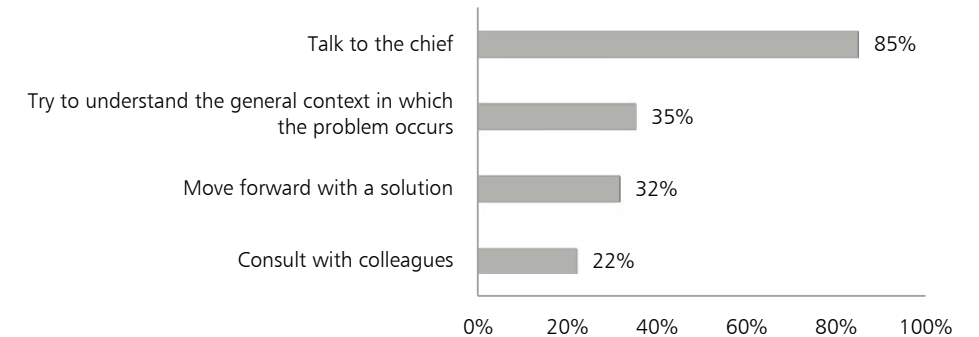


Source: Own elaboration

In this group too there is neither an explicit policy to encourage creativity nor a formalized program to collect suggestions, to implement them and to recognize their authors. However, as has already been mentioned, the respondents referred to certain situations during which workers can effectively present their innovative ideas: the weekly and monthly leadership meetings, the annual general meeting and the periodic surveys addressed to the workers. Moreover, workers are encouraged to share their suggestions with the director of the hotel as well as with their superiors, both informally and when they are challenged to. However, not all opportunities to contribute mentioned by the interviewees are effectively used by the workers. Most of them, when they have an idea or suggestion speak to their superior, which reveals that the managers have a key role. However, the majority of the respondents believed that few of the suggestions made are actually implemented and, if they are, their author remains unacknowledged. This reveals that in Group B hotels there is no explicit policy to encourage creativity and to stimulate and reward the generation of new ideas.

With regard to the use of knowledge in everyday tasks, workers were asked what they usually do when they face a problem. The data presented in Figure 5 shows that the majority (85%) of the respondents stated that they speak to their superiors, 35% would try to understand the general context in which the problem occurs 32% said they would come up with a solution and 22% said they consult with colleagues. These data show clearly that, at the level of problem resolution, there is a strong dependence on the formal hierarchy.

Figure 5 – Procedure before a problem (N = 167): Group B



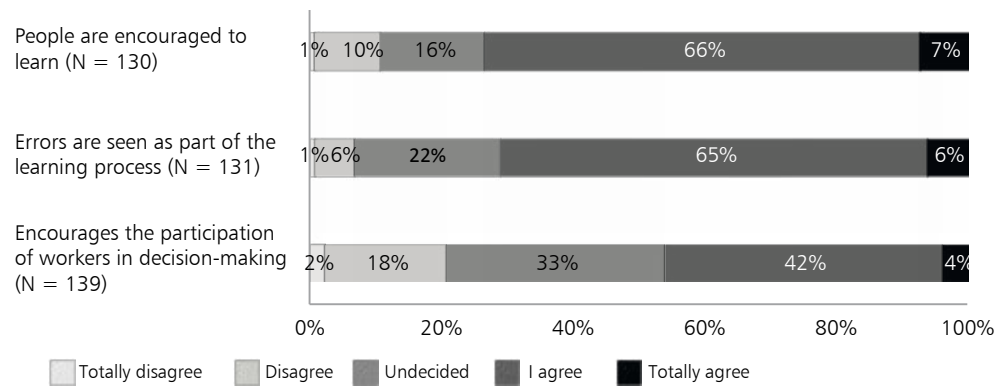
Source: Own elaboration

When asked about the stimulus for learning, three of the interviewees considered that – as in Group A – learning is effectively stimulated in Group B. According to the director of human resources, learning is implicit in the activity, since knowledge is the key to success in the hospitality industry. The director of hotel B5 stated that learning is embedded in the organizational culture.

I think learning is implicit in the activity itself, in what is the main activity of the group. ... The hospitality industry is an activity within which knowledge is critical to the success. Now, when I say knowledge I don't mean only technical knowledge but also what seems more important: behavioral knowledge. Now, within our business's logic: "from people to people," this business won't survive if people don't know the culture of the organization, if they don't know the activity, if they don't know very simple issues such as the interpersonal relationships. That knowledge management is done on a daily basis. It must be done (DHR-Group B).

Data from the survey shows that the stimulus for using knowledge is recognized by the majority of the workers from Group B: 73% of the respondents agree or totally agree with the statement "In the hotel people are encouraged to learn," and 71% of respondents agree or totally agree that mistakes are seen as part of the learning process, as shown in Figure 6. However, in relation to the participation of employees in the processes of decision-making, 53.8% of the respondents indicated that they totally disagree, disagree or were undecided. The data reveals that respondents do not really feel encouraged to participate in decision-making.

Figure 6 – Stimulate the use of knowledge: Group B



Source: Own elaboration

The case of Group C

In what concerns innovation in Group C, the responsible for the information systems refers that this group always tries to innovate, namely in the technology sector, as they want to be at the forefront of the international market. These features have become the very essence of the group.

We're always trying to develop ourselves. If you look at the history of the group, you'll note that Group C has always been a world leader in the implementation of new technologies. Let's see the Portuguese market: I developed with ANA Airports the in-flight screen (a monitor with flight information) and we were the first hotel in Portugal to have this technology. ...The first hotel to have TVs in the rooms was one of ours. The first hotel to have minibars in the rooms was from Group C. We were the first hotel chain to provide free Internet access throughout the hotel, for all customers. Therefore, we are always ahead of the market. This is the essence of Group C (RIS-Group C).

In relation to the incentives for creativity, we sought to understand if there's scope for people to disseminate their ideas and submit suggestions, and to ascertain whether these are implemented and recognized. Monthly departmental meetings are referred to as the occasions where workers can submit their ideas. In addition, workers can also communicate their ideas to their heads of department or use the suggestion box, although, according to the director of human resources, this is not often used.

Firstly, there is a lot of communication between the heads of departments and the employees. Secondly, we have the monthly meetings, with the heads of department and the employees. During these meetings, innovation is one of the issues. We are always asking: "Are there any ideas to improve relationships with other departments? Are there any ideas to improve anything?" Then they [the employees] speak and give ideas. We also have a suggestion box but it's not widely used. They prefer to speak (DHR-Group C).

According to the survey, this actually seems to be the main method of communicating ideas and suggestions for improvement. The majority of the surveyed employees (88%) stated that when they have an idea or suggestion they speak to their superior, and only 9% of the respondents said they would speak to the colleagues who represent them at meetings. It should be noted that only 2% indicated they would not usually tell anyone about their ideas or suggestions for improvement of work processes or services provided by the hotel.

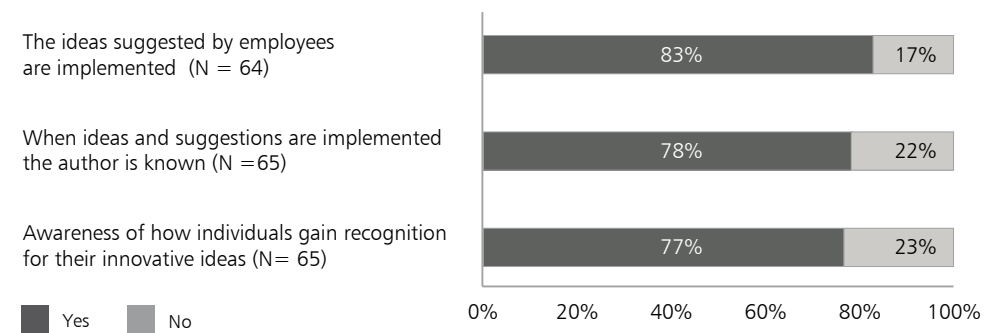
The general manager of hotel C and the director of human resources were unanimous in saying that the ideas of the employees, when they are considered good and achievable, are implemented. The recognition and reward for such ideas is undertaken through the process of the worker's assessment as an indicator of their proactivity.

People may present their own ideas. If the idea presented is something that may have a positive impact on the financial results or, eventually, in the well-being of the colleagues, I am immediately informed and we're going to think - with the person - about how to develop the project (DH- Group C).

The initiative of having introduced an idea is registered in the evaluation sheet as proactivity, as a person who wants to improve. And of course, all these things count in the evaluation (DHR-Group C).

Analyzing the opinion of the respondents of the survey in respect to the practices that reflect the development of new ideas and, therefore, encourage creativity, 83% considered that the ideas suggested by the workers are implemented. In the opinion of 78% of the respondents, when ideas and suggestions are implemented the author is known and 77% of respondents revealed that they know how they will be recognized if they submit an innovative idea (Figure 7).

Figure 7 – Encouraging creativity: Group C

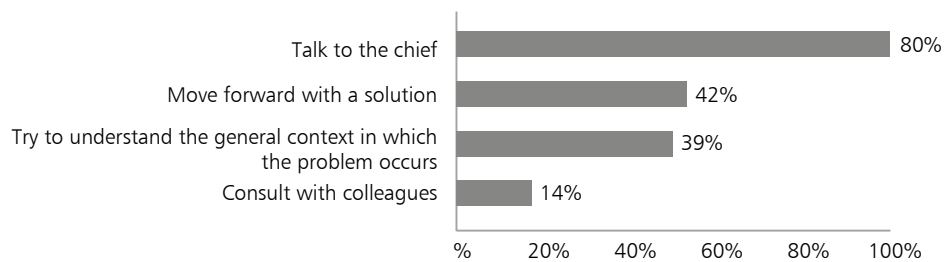


Source: Own elaboration

Hotel C does not have a formalized program for collecting suggestions and ideas, however, according to the director interviewed, workers can submit their ideas and suggestions to the heads of departments during the monthly meetings, or deposit them in the suggestion box, although the latter procedure is not very typical. According to the survey data, the majority of employees believe that most of the suggestions are implemented and valued.

The workers were also asked how they react when faced with a problem in the course of their daily tasks. It appears that, as in the previous groups, the vast majority (80%) would speak to their superior, 42% move forward with a solution, 39% try to understand the general context in which the problem occurs and only 14% consult with colleagues. Figure 8 reveals that problem-solving relies on the management. However, there are a significant number of respondents who are proactive and put forward solutions.

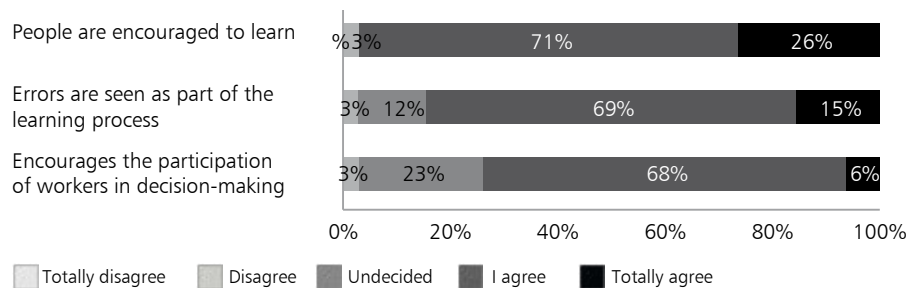
Figure 8 – Procedure before a problem (N = 66): Group C



Source: Own elaboration

When we asked the opinion of the employees about organizational learning stimuli, the majority recognized that this stimulus really exists: 97% of respondents *agreed* that the hotel employees are encouraged to learn, and about 85% *agreed* that mistakes are seen as part of the learning process. The levels of agreement tend to decrease in what concerns encouraging the employee's participation in decision-making (74%) (Figure 9).

Figure 9 – Stimulate the use of knowledge (N = 65)



Source: Own elaboration

Conclusions

This investigation has allowed us to conclude that although the concept of knowledge management itself is not completely internalized by the members of the studied hotels, knowledge management practices are present in their managerial activities.

A careful comparison of the three cases leads to the conclusion that none of the hotel groups have structured programs for collecting suggestions and implementation of new ideas, nor formal structures specifically designed for the development of implemented ideas in order to encourage creativity. In the absence of an integrated policy, formal and informal circumstances where workers can communicate their ideas and submit their suggestions for improvement are variable.

Although informality is mentioned by several authors as an important factor for the emergence of a creative environment, the lack of a clear policy to encourage creativity may result in the loss of suggestions which could have a potentially positive impact on the economic performance of these hotels. However, the survey data indicates that in Group C the policy of encouraging creativity is clearer than in the other groups. The data demonstrates that the main method for communicating ideas and suggestions of employees is through their superiors. This fact reveals the importance of the leadership for the creation of new knowledge, as sustained by Nonaka and Takeuchi (1997). Middle management are in an intermediate position where they can synthesize and integrate knowledge coming from frontline workers with knowledge coming from top-level executives.

The groups studied encouraged the creative application of knowledge in the context of what Tidd et al. (2003) designated as the "product innovation" which consists in the introduction of new products and hotel services that, in turn, lead to innovation processes, namely, to the introduction of new tasks, decision-making at the level of production of those products, and the provision of these services.

The Accommodation and F&B Committees of Group A, and the Safety and Hygiene Committee of hotel A4, assume great importance in the field of innovation, because this is where new ideas are transformed into new products. In turn, Group C has a centralized research team that creates new knowledge and operational innovation. However, these innovations occur at the central level and not at the hotel level. In the Group B hotels, innovation results, fundamentally, from inside experimentation, but also from the observation and implementation of the experiences of other hotels that do not belong to the group.

The use of knowledge in everyday work also involves making decisions and solving problems. However, in these organizations there is a great dependency on the formal hierarchy and a great preponderance of intermediate-level leaders to achieve this.

Given the rapid socioeconomic and political transformations, tourism and hospitality organizations face difficulties such as operating in highly uncertain contexts, the rapid change in the preferences of the customers and, therefore, the shortening of the products' and services' life-cycles. Customer loyalty and customer satisfaction are the most important factors for the success of a hotel chain. Tourism and hospitality workers have direct contact with the customers, so it is especially important that these workers process the right knowledge about customer preferences and how to provide the best service (Bouncken, 2002). Therefore, knowledge management can be an effective organizational approach to help the hospitality industry to deal with turbulent contexts. However, it is of the utmost importance that these organizations undertake knowledge management as an integral part of their strategy, in order to integrate and enhance the various actions, otherwise, these efforts may not have a great impact on their overall performance.

References

- Alves, A. C. F. de C. G. (2008). *A cultura da Qualidade nas Organizações de Alojamento e Restauração*. Master Thesis. Faculdade de Economia, Universidade do Algarve. 370 pp.
- Bardin, L. (1995). *Análise de conteúdo*. Edições 70. Lisboa.
- Bell, D. (1973). *The Coming of Post-Industrial Society: A Venture in Social Forecasting*. Basic Books. New York.
- Bouncken, R. B. (2002). Knowledge Management for Quality Improvements in Hotels. *Journal of Quality Assurance in Hospitality & Tourism*. 3(3/4): 25–59.
- Bukowitz, W. R. and Williams, R. L. (2002). *Manual de Gestão do Conhecimento: ferramentas e técnicas que criam valor para a empresa*. Bookman. Porto-Alegre.
- Cabrira, M. do R. (2009). *Capital Intelectual e Desempenho Organizacional*. Lidel. Lisboa.
- Camisón, C. and Monfort-Mir, V. M. (2012). Measuring innovation in tourism from the Schumpeterian and the dynamic-capabilities perspectives. *Tourism Management*. 33(4): 776–789. Elsevier Ltd.
- Camisón, C., Lapedra, R., Segarra, M. and Boronat, M. (2003). Marco conceptual de la relación entre innovación y tamaño organizativo. *Madrid+d Revista de Investigación en Gestión de la Innovación y Tecnología*. 19 (Diciembre): 49–61.
- Camisón-Zornoza, C. and Monfort-Mir, V. M. (2009). *Innovación en la empresa turística*. *Primera Conferencia Internacional sobre la Medición y el Análisis Económico del Turismo Regional*. Donostia – San Sebastián: CICTourGUNE - Cooperative Research Center in Tourism.
- Cardoso, L. (2003). *Gerir conhecimento e gerar competitividade: estudo empírico sobre a gestão do conhecimento e seu impacto no desempenho organizacional*. Ph.D. Thesis. Faculdade de Psicologia e de Ciências da Educação, Universidade de Coimbra. 594 pp.
- Cooper, C. (2006). knowledge management and tourism. *Annals of Tourism Research*. 33(1): 47–64.
- Costa, R. (2008). *Introdução à Gestão Hoteleira*. Lidel. Lisboa.
- Daft, R. L. (1978). A Dual-Core Model of Organizational Innovation. *Academy of Management Journal*. 21 (2): 193–210.
- Damanpour, F. and Evan, W. M. (1984). Organizational Innovation and Performance: The Problem of “Organizational Lag.” *Administrative Science Quarterly*. 29: 392–409.
- Damanpour, F., Walker, R. M. and Avellaneda, C. N. (2009). Combinative Effects of Innovation Types and Organizational Performance: A Longitudinal Study of Service Organizations. *Journal of Management Studies*. 46(4): 650–675.
- Davenport, T. H. and Prusak, L. (1998). *Working Knowledge: How organizations manage what they know*. Harvard Business School Press. Boston, Massachusetts.
- Drucker, P. F. (1996). *A Gestão numa Época de Grande Mudança*. Difusão Cultural. Lisboa.
- Freire, J. (2001). *Sociologia do Trabalho: uma introdução*. 2th edition, Edições Afrontamento. Porto.
- Ghiglione, R. and Matalon, B. (1997). *O Inquérito: Teoria e Prática*. 3th edition, Celta Editora. Oeiras.
- Guerra, I. C. (2006). *Pesquisa Qualitativa e Análise de Conteúdo: Sentidos e formas de uso*. Príncipe Editora. Estoril.
- Hallin, C. A. and Marnburg, E. (2008). Knowledge management in the hospitality industry: A review of empirical research. *Tourism Management*. 29(2): 366–381.
- Hameed, M. A., Counsell, S. and Swift, S. (2012). A meta-analysis of relationships between organizational characteristics and IT innovation adoption in organizations. *Information & Management*. 49(5): 218–232..
- Jansen, J. J. P., Van Den Bosch, F. A. J. and Volberda, H. W. (2006). Exploratory Innovation, Exploitative Innovation, and Performance: Effects of Organizational Antecedents and Environmental Moderators. *Management Science*. 52(11): 1661–1674.
- Julián, B. F. (2009). *Prácticas organizativas, capacidades dinámicas y desempeño económico*. Ph.D. Thesis. Departament d'Administració d'Empreses i Màrqueting, Universitat Jaume I. 481 pp.
- Kovács, I. (2002). *As Metamorfoses do Emprego: Ilusões e Problemas da Sociedade da Informação*. Celta. Oeiras.
- Liebowitz, J. (2001). Knowledge management and its link to artificial intelligence. *Expert Systems with Applications*. 20: 1–6.
- Liebowitz, J. and Beckman, T. J. (1998). *Knowledge Organizations: What Every Manager Should Know*. St. Lucie Press. Boca Raton.
- Marconi, M. de A. and Lakatos, E. M. (1999). *Técnicas de Pesquisa: planejamento e execução de pesquisas, amostragens e técnicas de pesquisas, elaboração, análise e interpretação de dados* 4th edition, Editora Atlas S. A.. São Paulo.
- McElroy, M. W. (1999). *Double-Loop Knowledge Management: A White Paper*. Accessed in 25th of March 2013, from <http://www.learning-org.com/docs/McElroyDLKMv3.pdf>. html.
- McElroy, M. W. (2003). Understanding “The New Knowledge Management” (Paper N.o 11). Accessed in 18th of March 2013, on the Web site of: Macroinnovation Associates, LLC: http://www.macroinnovation.com/images/Understanding_New_KM.pdf. html.
- Melo, C. (2005). *Concepção de um Sistema de Apoio à decisão aplicado à gestão do Investimento Turístico*. Instituto de Turismo de Portugal. Lisboa.
- Nonaka, I. and Konno, N. (1998). The Concept of Ba: Building A Foundation For Knowledge Creation. *California Management Review*. 40(3): 40–54.
- Nonaka, I. and Takeuchi, H. (1995). *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press. New York.
- Nonaka, I. and Takeuchi, H. (1997). *Criação de conhecimento na empresa: como as empresas japonesas gerem a dinâmica da inovação*. 13th edition, Editora Campus. Rio de Janeiro.
- Ruhanen, L. and Cooper, C. (2004). Applying a Knowledge Management Framework to Tourism Research. *Tourism Recreation Research*. 29 (1): 83–88.
- Serrano, A. and C. Fialho (2003). *Gestão do Conhecimento: O Novo Paradigma das Organizações*, FCA – Editora de Informática. Lisboa.
- Silva, C. A. da. (2004). *Reencontro com o mundo organizacional: uma abordagem sociológica*. Universidade de Évora. Évora.
- Stewart, T. (1999). *Capital Intelectual: A nova riqueza das organizações*. Sílabo. Lisboa.
- Stollenwerk, M. F. L. (1999). *Gestão do Conhecimento, Inteligência Competitiva e Estratégia Empresarial: em busca de uma abordagem integrada*. In *Workshop Brasileiro de Inteligência Competitiva, Rio de Janeiro, Brasil*. Associação Brasileira dos Analistas de Inteligência Competitiva. Rio de Janeiro.
- Sveiby, K. E. (1998). *A Nova Riqueza das Organizações: Gerenciando e Avaliando patrimônios de Conhecimento*. 7th edition, Editora Campus. São Paulo.
- Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*. 28(13): 1319–1350.
- Teece, D. J., Pisano, G. and Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*. 18(7): 509–533.

Terra, J. C. C. (2001). Gestão do Conhecimento: aspectos conceituais e estudo exploratório sobre as práticas de empresas brasileiras. In: M. T. L. Fleury & M. de M. Oliveira Jr. (Eds.), *Gestão Estratégica do Conhecimento: integrando aprendizagem, conhecimento e competência*. Publicações Atlas. São Paulo.

Terra, J. C. C. (2003). Implantando a Gestão do Conhecimento. In: R. V. da Silva & A. Neves (Eds.), *Gestão de Empresas na era do conhecimento*. Edições Sílabo. Lisboa.

Tidd, J., Bessant, J. and Pavitt, K. (2003). Gestão da inovação: a integração das mudanças tecnológicas, de mercado e organizacionais. Monitor. Lisboa.

Vieira, J. M. (1997). Portugal, A Economia do Turismo em Portugal. Dom Quixote. Lisboa.

Wiig, K. M. (1997a). Integrating intellectual capital and knowledge management. *Long Range Planning*, 30(3), 399–405.

Wiig, K. M. (1997b). Knowledge Management: An Introduction and Perspective. *Journal of Knowledge Management*. 1(1): 6–14.

Wiig, K. M. (2004). People-focused knowledge management: how effective decision making leads to corporate success. Elsevier Inc. Oxford.

Yin, R. K. (2005). *Estudo de caso: planejamento e métodos*. 3th edition, Bookman. Porto Alegre.

Zaei, M. E. (2014). Knowledge Management in Hospitality and Tourism Industry: A KM Research Perspective. *Information and Knowledge Managment*. 4(9): 114–123.

Zheng, W., Yang, B. and Mclean, G. N. (2010). Linking organizational culture, structure, strategy, and organizational effectiveness: Mediating role of knowledge management. *Journal of Business Research*. 63(7): 763–771.

CHAPTER 7

Bottom-up Initiatives of Economic and Symbolic Innovation in Oporto City Centre

Célia Marisa Fonseca Ferreira
Teresa Sá Marques
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Introduction

Knowledge and innovation production processes have an increasing attention in the academia, the business sector and in public decision due to the recognition of its importance to economic growth, in particular, and the development of societies, in general.

Processes of creation, diffusion and application of knowledge are considered the driving force of economic dynamics at different scales and recognized as a source of innovation.

In scientific literature innovation is considered a key factor of economic growth and competitiveness of territories. Cities are characterized by high concentration and diversification of economic activities and people, which provides prone environments to generation, dissemination and accumulation of knowledge and innovation. They attract talent, knowledge-intensive investment and are friendly places to creativity, innovation and entrepreneurship.

The structure and organization of the economy of cities result from individual actions of many economic agents (individuals, families, business, government institutions, diversified organizations), as well as from the network of relationships established between them.

Entrepreneurship initiatives of private sector has been of particular attention to researchers and policy makers due to the recognition that they are essential for the development and economic growth, job creation and innovation. The scientific literature explains entrepreneurship as a product of local context and characteristics of individuals. The territories are endowed with different infrastructures of knowledge, institutions and resources. Individuals are heterogeneous with regard to knowledge, skills, values and preferences that guide their motivations and behaviors. Thus, the entrepreneurship process depends on the opportunities offered by territories and the capacity and motivation of individuals to identify, evaluate and exploit these opportunities. In other words, for people with the same individual characteristics territorial context can make a difference in the extent that can favor an entrepreneurial attitude or, on the contrary, inhibit it (Boschma & Martin 2010; Bosma & Sternberg 2014). Urban areas are particularly privileged in what concern to the existence of favorable conditions for entrepreneurial process. Characterized by a high population density and a strong flow of people (inhabitants, workers, students, visitors), they facilitate the increase and diversification of demand and the access to inputs needed for production of goods and services (financial capital, labor force, suppliers, among others) (García 2014).

As is characteristic of European cities, retail sector is linked to Oporto from its beginning, being a key aspect in understanding the development of city in general and in particular of its centre (Fernandes 1997).

It is our aim to analyze bottom-up initiatives of economic entrepreneurship in Oporto city centre through the approach of urban agents related to retail sector. Our results are based in 24 semi-structured interviews, made during 2015, to entrepreneurs of different types and formats of economic activity. Respondents were owners, managers or employees of fixed establishments and responsible for management and organization of urban markets.

This work is structured this way: first its approached some important ideas about theory, analytical models and public strategies in what concerns to economic development and innovation; in a second point are presented the main challenges faced nowadays by cities and the issues related to entrepreneurship and bottom-up initiatives for local economic development; in the following point is explained the case study discussed in this paper; and finally, some conclusions are systematized.

Economic development and innovation: theory, analytical models and public strategies

Recognition of the importance of knowledge and innovation production processes for the development of societies, in general, and for economic growth, in particular, is at the root of growing attention given to them in the context of academic research, business sector and public decision. With the advancement of economies and societies, knowledge matter even more and in ways that are not always predictable or controllable. The well succeed performance of developed and developing economies depends increasingly on knowledge (Carayannis & Campbell 2011).

Knowledge is considered the driving force of economic, social and technological dynamics at different scales and recognized as a source of innovation (van Geenhuizen & Nijkamp 2012).

There is a broader body of scientific literature where it is argued that innovation is a key factor of economic growth and competitiveness of territories (Carayannis & Grigoroudis 2014; Dabic et al. 2011). Innovation is a phenomenon inherent to human development. The emergence of innovations capable of changing people's behavior, working methods and the labor market characterize the history of mankind (Galindo & Méndez 2014). It has become increasingly important to meet the societal challenges of our time. Ideas, creativity, skills and ability to solve problems are considered driving forces of innovation (Saari et al. 2015).

Innovation is often linked to the creation of a sustainable market around the introduction of new or improved products or processes. A broader interpretation refers innovation as an idea, practice or material artifact adopted by individuals or organizations. It tends to change perceptions and relationships at the organizational level. But in its wider context (socio-technical, economic and political) can significantly impact, shape and evolve the way people live their lives, how business are created, managed and how they perform, and how nations thrive or decline (Carayannis & Campbell 2011).

The geography of innovation is complex and the capability to pass from knowledge to innovation and innovation to economic growth is different from region to region (Camagni & Capello

2013). The great development of the theoretical framework around innovation took place since the 50s of twentieth century and was around 30 years after, in academia, with the development of innovation systems studies, that the processes and dynamics of innovation were explained as a result of networks of interaction between agents - companies, universities and laboratories, government, schools and other intermediary institutions. It is consensual that the innovation process is the transformation of knowledge into goods, services or processes and is the result of the activity of different agents and the network of relationships between them (Salavisa & Fontes 2012).

Networks facilitate the flows of information and knowledge, the access to resources, the reduction of transaction costs, the influence of agents, the promotion of reputation and social recognition or the enhancement of personal or group qualities. The social capital can be seen as the sum of current and potential resources that a person or organization can access or derive through network integration (Soetanto et al. 2012). In scientific literature have been discussed explanatory models of these processes in an attempt to create analytical frameworks that constitute a reference for the analysis and understanding of knowledge and innovation production in different fields of knowledge or geographical areas. Models became more complex over time, due to the consideration of multiple actors and factors involved. Some authors argue in favor of co-existence and co-evolution of different analytical models in a given innovation system of a given area (Carayannis & Campbell 2011).

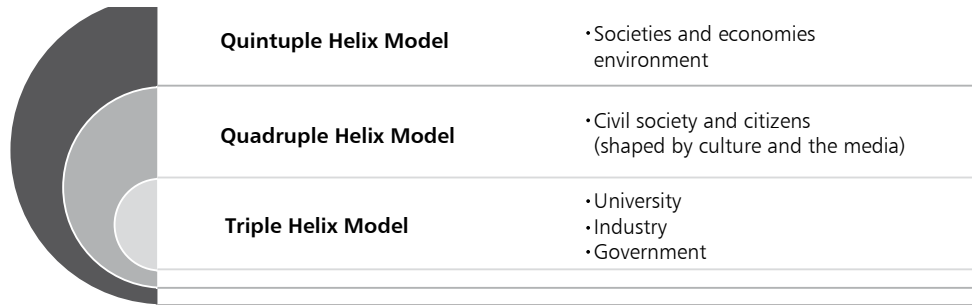
Classic in terms of formulation, the linear model of innovation gives a simplistic view of the production and use of knowledge. The emergence of more complex models, based not only on the interactions between multiple agents as well on their territorialization, derived from the growing need of intermediation generated as relations became more complex and multifaceted (Alexander & Martin 2013). In summary, the linear model of innovation explains the production of innovation through the succession of stages: the fundamental research of universities becomes applied research of institutions related to the academy; in turn, applied research is adopted and transformed into experimental development that is put on the market by companies. In nonlinear models of innovation, basic research, applied research and experimental development are developed in parallel, occurring interaction between the different actors involved throughout the process (Carayannis & Campbell 2011). There are various approaches in terms of non-linear innovation models (Carayannis & Campbell 2011).

In 1996, Loet Leydesdorff and Henry Etzkowitz presented the model of Triple Helix as an analysis tool of the dynamics associated with knowledge-based economies and innovation systems. In terms of formulation, the model can be seen by two different sides: as neo-institutional model it reflects the relationships and exchanges among different institutions and as neo-evolutionary model it translates the mechanisms of exchanges between three different functions – creation of wealth, knowledge production and regulatory control (Leydesdorff 2012). Each of the propellers acts reflexively in response to the actions of the other two. The knowledge-based economies and innovation systems evolve depending on the actions and mutual adjustments. The university represents the role of knowledge creation and intellectual capital and reflects the academic leadership; the industry is the creation of economic wealth and reflects the business strategies, and government institutions represent normative control function and regulation of the public sphere (Leydesdorff et al. 2006; Leydesdorff & Meyer 2006; Leydesdorff & Meyer 2007).

The model of the Triple Helix is considered today a classic perspective (Alexander & Martin 2013).

Based on the analytical model of Leydesdorff and Etzkowitz, Carayannis and Campbell (2011) present two more comprehensive models to explain the advanced innovation systems. Each model comprises the model(s) less comprehensive (Figure 1).

Figure 1 – Framework of triple, quadruple and quintuple helix models



Source: Adapted of Carayannis & Campbell (2011, p. 343)

The Quadruple Helix model adds, to the three original propellers, civil society and the public, shaped by cultural characteristics and the media. In this model, emphasis is given to the culture of knowledge and knowledge of the culture and to the values of society and their lifestyles. The sciences and the arts are placed in the same importance plan. The model refers to the structures and processes of the glocal knowledge-based economy and society. It brings to the discussion issues related to the democracy of knowledge. The Quintuple Helix model adds the ambience of societies (social ecology) and economies as the driving force of progress in knowledge production processes and innovation systems. The innovation ecosystem contextualizes Quadruple and Quintuple Helix models. It combines and integrates social and natural systems and environments, stressing the importance of diversity of agents. This can result in democracy of knowledge led by the pluralism of different paradigms in terms of knowledge and innovation (Carayannis & Campbell 2011).

Science and technology are increasingly considered as main sources of sustainable and competitive advantages for regions and nations. However, the determining factor for its effectiveness is the quality and quantity of entrepreneurship-enabled innovation to unlock and capture the financial benefits of science in the form of private, public or hybrid goods (Carayannis & Campbell 2011).

Currently, we are increasingly involved in a globalized knowledge-based economy, marked by increasing turbulence, uncertainty and ambiguity. This new reality began to emerge in the 90s of twentieth century, when Information and Communication Technologies (ICT) have revolutionized communications, facilitating access and wide dissemination of knowledge. In the theoretical literature, this revolution has been widely studied and new ways of producing innovation are highlighted. The open innovation is one of that forms (Johannessen & Olsen 2010). It has deserved particular attention in recent years not only by academia and policy-makers but also by the business sector (Papadopoulos et al. 2013).

All organizations from different sectors of activity use any product or process that directly influences its competitiveness, which motivates them to get the innovation they need or that contributes to its efficiency internally or externally (Robertson et al. 2012).

Since, in 2003, Henry Chesbrough published a paper on this issue, open innovation is being debated not only in the domain of innovation management, but also in others areas of knowledge. Although there is no single and completely clear definition of concept, as the name indicates, the base premise is the opening of innovation process to the outside, in a movement that takes place in both directions - inside knowledge flows from organizations or business to the outside and the outside knowledge flows to the inside of organizations or business - with the aim of accelerating internal production of innovation and expand markets where innovation is placed (Huizingh 2011).

Open innovation reflects the free transfer of knowledge between multiple partners (Alexander & Martin 2013). But it depends not only on circulation of knowledge as well as its incorporation by organizations or business and its effective application (Robertson et al. 2012). It is related to the collective intelligence (involvement in communities where is possible to deal with different ways of thinking and acting) and with participation in innovative communities that relate voluntarily (Papadopoulos et al. 2013).

Carayannis wrote about open innovation diplomacy, in the context of Quadruple and Quintuple Helix models, arguing that it is the concept and practice of shortening distances and minimizing obstacles (cultural, socio-economic, technological) through initiatives that promote the connection of ideas and solutions, evaluated and potentiated by the markets and investors. In this sense, open innovation diplomacy qualifies a new strategy, a new way of doing politics and a new governance approach (Carayannis & Campbell 2011).

Cities and economic development

Challenges and local responses

Cities of developed countries made the transition to knowledge-based economies mainly in the 80s of the twentieth century. Contours of these economies are different depending on the characteristics of cities (van Geenhuizen & Nijkamp 2012).

In the 90s of twentieth century, the dynamics and impacts of economic globalization became particularly evident, and instead of a loss of importance of local in new geographies of global influence, it occur the affirmation of local on global and of global on local. Glocalization, in the interconnection between the different scales of action and influence, has become one of the most important phenomenon of contemporaneity (Seixas maio 2013). As a process of interpenetration of convergent systems, networks and innovation sectors, driven increasingly by complex, non-linear and dynamic processes of creation, dissemination and use of knowledge, glocalization confronts us with the need to reconceptualize the ways and means of production, use and renewal of knowledge (Carayannis & Campbell 2011).

Cities are par excellence locals of generation, dissemination and accumulation of knowledge, which is central to the phenomena of innovation and economic growth (Fujita & Krugman 2004).

A significant and growing proportion of economic activities of the countries is located in urban areas as a result of proximity and density of externalities. Urban contexts are characterized by the diversity and density of organizations, companies and people, which, in turn, attract new economic activities necessary to meet the arising needs and expectations of this concentration of people, business and organizations (Nijkamp & Kourtit 2013)

Sectoral diversity of urban economies provides a creative environment (Caragliu et al. 2012). The diversity of assets (knowledge institutes, economic diversity, labor market dimension, cultural animation, international orientation, consumption values) attract talent, knowledge-intensive investment and makes them friendly places to innovation and entrepreneurship (Carvalho et al. 2014).

The structure and organization of the economy result from individual actions and behavior of many economic agents (individuals, families, business, government institutions, diversified organizations). In evolutionary economic geography, entrepreneurs and consumers are considered basic units of analysis at the micro level (Boschma & Martin 2010). Economic and social phenomena are closely related and there is consensus in the scientific literature that should be analyzed in a complementary way (Bathelt & Glückler 2003).

Urban planners, economic geographers and policy makers recognize that the factors underlying the economic growth of cities are increasingly intangible (such as institutions and culture) and of increased mobility (such as financial capital, codified knowledge and, in part, human capital). There is also the recognition that innovation is a cyclical process, resulting from interaction of different actors in networks (Nijkamp & Kourtit 2013).

A system, as in the case of a city, is more resilient when in a state of reorganization, growth and innovation. After a shock (as it was, in the past, suburbanization of retail activities) city centres may simply resist without significant changes, modernize with significant changes that change its character, or be resilient, maintaining their key attributes and identity but adapting to new economic, social and cultural contexts. In these times of economic-financial crisis it has been promoted a new approach of urban management, with a strong link between the regeneration of the city centre and the resilience of the retail sector. The relationship between urban spaces, retail activities, planning structures and actions and governance are different from country to country and even at the local level. On the same street where the same policies and the same cultural contexts are applied, we can find different answers from retail entrepreneurs and different reactions / actions by consumers (Fernandes & Chamusca 2014).

Global phenomena, such as the consequences of the financial crisis for consumer purchasing power, the rising prices of basic goods, the demographic trends (notably the aging population) and the effort towards sustainability, pose challenges to the current business models and processes in the retail sector (CE 31/01/2013). The retail sector include all resale activities of new or used goods for consumption of individuals, companies or institutions, through various formats, including fixed establishments, fairs and markets, doorstep or correspondence selling, peddling or e-commerce (Barreta junho 2012).

Innovation is one of the crucial factors in ensuring economic growth. Retailers are important innovation vectors. They contribute to form and follow closely consumer trends, conveying this information to suppliers. They act as innovation multipliers, adopting and applying innovative technologies quickly throughout the supply chain (CE 31/01/2013).

The characteristics of entrepreneurs, their networks and capacity of investment, innovation and anticipation of change are key aspects of designing and implementing successful adaptation strategies, with consequences for the decline or prosperity of retail areas in the urban context (Barata-Salgueiro 2014).

It is recognized that retail sector has undergone significant changes in recent decades. Small street shops gradually lost importance and sought to add additional value to the goods in an attempt to reach new consumers. Specializations, locations, shapes and formats multiplied and modes of operation diversified and the size of firms and the interactions between producers and consumers have also changed considerably (Fernandes & Chamusca 2014). The significant expansion of e-commerce has led to greater competition between traditional retailers and online distribution channels (CE 31/01/2013).

Nevertheless, the retail sector was, is and always will be an urban activity par excellence (Cachinho 2014). There is also consensus that consumption patterns change considerably in recent decades, in terms of requirements, values, practices and power of consumption. Shopping became increasingly associated with leisure, entertainment and social distinction (Barata-Salgueiro 2014). Consumer preferences are nowadays much more heterogeneous and of highly individual nature (Seixas maio 2013). Consumers constantly renew their needs and above all their desires and expectations, change their behavior and lifestyles. This has direct consequences for trade activities, involving challenges to entrepreneurs in order to survive. Currently, the private sector investment in terms of attraction of consumers is intended not only sell goods and provide services but also to provide new retail concepts, pleasant ambiances, new or different types of goods or services and multiple opportunities and consumer experiences (Cachinho 2014; Fernandes & Chamusca 2014; Sorescu et al. 2011). Retailers are best described as ecosystems conductors where is created value delivered to consumers and appropriate by entrepreneur and their business partners (Sorescu et al. 2011).

Entrepreneurship and bottom-up initiatives

Entrepreneurship research dates from 1755 when Cantillon introduced the term entrepreneur in his *Essai sur la nature du commerce en général*. Since then, this topic has been of particular attention to researchers and policy makers because of the recognition that it is essential for the development and economic growth, job creation and innovation (Simón-Moya et al. 2014).

Over the past two decades there has been a strengthening of entrepreneurship research, with particular attention to the spatial dimension of entrepreneurial activities and its causes and effects. There is still a long way to go to arrive at a theory or at least a theoretical framework to explain the processes, causes and effects of entrepreneurship in urban areas (Bosma & Sternberg 2014). The current economic situation encourages research on the driving forces of economic growth. Entrepreneurship has a positive effect on economic growth by generating economic activity. Schumpeter and many other authors have argued in the early twentieth century that entrepreneurship and innovation was becoming gradually a driving force of job creation and economic growth (Audretsch 2015; Castaño et al. 2015; Galindo & Méndez 2014). Thus, determine the factors that lead to entrepreneurship has become important in academia,

namely in an attempt to support the formulation of policies that create conditions for their development (Castaño et al. 2015).

The scientific literature explains entrepreneurship as a product of local context and characteristics of individuals. The territories are endowed with different infrastructures of knowledge, institutions and resources. Individuals are heterogeneous with regard to knowledge, skills, values and preferences that guide their motivations and behaviors. Thus, the entrepreneurship process depends on the opportunities offered by the territories and the capacity and motivation of individuals to identify, evaluate and exploit these opportunities. In other words, for people with the same individual characteristics territorial context can make a difference in the extent that can favor an entrepreneurial attitude or, on the contrary, inhibit it (Boschma & Martin 2010; Bosma & Sternberg 2014).

Urban areas are particularly privileged in what concern to the existence of favorable conditions for entrepreneurial process. Characterized by a high population density and a strong flow of people (inhabitants, workers, visitors), they facilitate the increase and diversification of demand and the access to inputs needed for production of goods and services (financial capital, labor, suppliers, among others) (García 2014).

With regard in particular to urban markets, various international organizations recognize that this form of economic activity, very ancient in its origins but with innovative contours today, have advantages to urban areas in economic, social, cultural and even environmental domains. They create employment and entrepreneurship opportunities, to the extent that allow people with micro businesses to show their work, products and skills (NABMA Sem data; URBACT março 2015).

Several studies emphasize that entrepreneurs do not work in social, cultural or economic isolation. They are encouraged or constrained by local societal and organizational infrastructure. Entrepreneurship takes place in a specific environment in which the entrepreneur looks for employees, business partners and consumers. The spatial, temporal, social, historical and institutional context should be taken into account to the extent that generates opportunities or limitations to entrepreneurship (García 2014). Education, especially higher education, is an important factor in that it provides the acquisition of skills and attitudes conducive to entrepreneurship, contributing to a greater ability to identify opportunities (García 2014; Simón-Moya et al. 2014). There are, however, some studies indicating a reverse situation. In some European cities are the low skills that lead to entrepreneurship (García 2014).

Urban areas provide contexts that facilitate the identification and access to business opportunities and fruitful collaborations by contact with people with information, knowledge, skills and business experience and they also enable contact with the most qualified individuals in the same or related fields of knowledge. The possibility of learning with these people stimulates the accumulation of human capital in urban environments and can lead to the creation and recognition of business opportunities (Bosma & Sternberg 2014).

On the other hand, the institutional context, the planning system or the model of governance are factors to equate. National and local policies connected with the establishments licensing rules, public support for retailers, the structure of the city (monocentric or polycentric) and the importance of regeneration policies provide the environment for investment decisions (Barata-Salgueiro 2014).

Estrin et al. (2013) and Simón-Moya et al. (2014) emphasize the importance of the institutional context. Institutions can be formal (such as the laws or regulations where is defined the economic incentives and bureaucratic costs that influence individual and organizational choices) or informal (social, cultural or religious norms, customs, traditions, believes). Informal institutions are socially rooted and are therefore more difficult to change. They develop informally over time. The authors report that a growing number of academic studies shows that entrepreneurial activity is strongly influenced by the institutional context: the strategies of entrepreneurs reflect the opportunities and limitations set by institutions. They create the incentive structures determining the choice of entrepreneurship at the expense of other forms of occupation, as well the type of entrepreneurship and business dimension. Estrin et al. argue that local social networks can, in some extent, mitigate negative impact of an unfavorable institutional environment, by facilitating access to the resources needed to creation of business and to counseling and support.

Castaño et al. (2015) noted the importance of cultural factors and economic performance of the territories, to the extent that this performance being positive generates positive economic expectations and improves the perception of opportunities, motivating individuals to engage in entrepreneurial activities. Innovations produced by entrepreneurs are, in their opinion, encouragement factors for others to enter the world of entrepreneurship and innovation. Galindo and Méndez (2014) find that there is a circular effect between innovation, economic growth and entrepreneurship, in that these three phenomena influence each other positively.

In scientific literature are identified two fundamental types of entrepreneurship according to motivation: entrepreneurship by opportunity and entrepreneurship by necessity. While entrepreneurship by opportunity is the most common, entrepreneurship by necessity is quite significant in many urban contexts. The entrepreneurs by necessity are defined as people compelled to start a business because they have no other job opportunities and need a source of income or people who are expecting to lose their jobs or already in a situation of unemployment. Urban areas with high unemployment rates may have higher occurrences of entrepreneurship by necessity (Bosma & Sternberg 2014).

In a study about entrepreneurship in European cities, Bosma and Sternberg (2014) concluded that urban areas characterized by economic growth and diversity of economic activities (more than specialization) have more entrepreneurs motivated by opportunity.

Taylor, in a study of forms of self-employment in the UK, says that statistics on employment indicate a growing number of people who are self-employed. The discussion around this topic is complex due to the variety and diversity of possibilities that fall under this designation, that includes the self-employed with employees, the freelancers, those who have their small business assembled at home, among others. The author points out that is increasingly self-employment by unemployed, elderly people with insufficient pensions or people with a second job. In their opinion, these are not the entrepreneurs considered potential drivers of economic prosperity, but marginalized figures of economies (Taylor 2015).

In a comparative study of English communities, Bailey and Madeleine (2015) concluded that the top-down initiatives led by government institutions tend to result in a smaller community empowerment, while the bottom-up initiatives which may in part be supported by the statecreate opportunities with potential for higher levels of transformation. However, the most prosperous areas, with skilled people and greater involvement in business, are more likely to

take advantage of these opportunities than the most depressed areas.

In relation to entrepreneurship measurement, Estrin et al. (2013) believe that the combination of theories about entrepreneurship and the empirical testing of hypotheses is not a trivial matter, as they consider that entrepreneurship is often measured imperfectly. Several authors have used new business registered and self-employment as proxies of entrepreneurship. The former is used as indicative of entrepreneurship dynamics. The self-employment is understood as the creation of income through a business in individual name or professional activity. It is used as a proxy measure since many of these businesses grow and create jobs. However, there is the awareness that not all self-employed are entrepreneurs (García 2014). Galindo and Méndez (2014) used private investment as proxy of entrepreneurship.

In terms of public policies and strategies, at the turn of the twenty-first century, the Lisbon Strategy guidelines aimed making Europe the most competitive and dynamic knowledge-based economy, capable of sustainable economic growth with more and better jobs. The Strategy underlined the role of entrepreneurship in adaptation to economic changes and increased competitiveness, emphasizing the need to provide a favorable environment for the creation and development of small and medium enterprises (García 2014). It was succeeded by Strategy Europe 2020, focused on smart, sustainable and inclusive growth, highlighting the importance of entrepreneurship for achievement of these goals (CE 3/03/2010). The European Commission in European Action Plan for Retail Sector defines as strategic goals: to meet the challenges the retail sector face nowadays, to implement the single market in this sector and to create a coherent and comprehensive strategy to contribute to their full operationalization. It is recognized in the document that to pursuit these objectives is necessary not only measures imposed from the top to the bottom but it is strongly required the active cooperation and initiative of retailers themselves (CE 31/01/2013).

Bottom-up initiatives in Oporto city centre

The city of Oporto has reached in recent years a greater visibility at national and international level. Its landscape, the architectural and cultural heritage, the emblematic equipment (such as Music House and Serralves Foundation and Gardens) and recreational and cultural events, as well as evening entertainment, especially in the centre, are factors of attraction of people. The growth of tourism along with the number of residents, workers, students and other users who use the city in their day to day contribute to the large flow of people at different times of the day, generating diverse experiences of the city, in general, and of its centre, in particular. The centre has always played an important role in the history of the city as an important economic hub and is nowadays the center of political and institutional decision of the municipality. In 2000, economy of Oporto city centre was heavily focused on the trade of various formats, from traditional shopping streets, traditional fairs and peddling to shopping centers and galleries (Quatenaire 2000). Since then many changes occur.

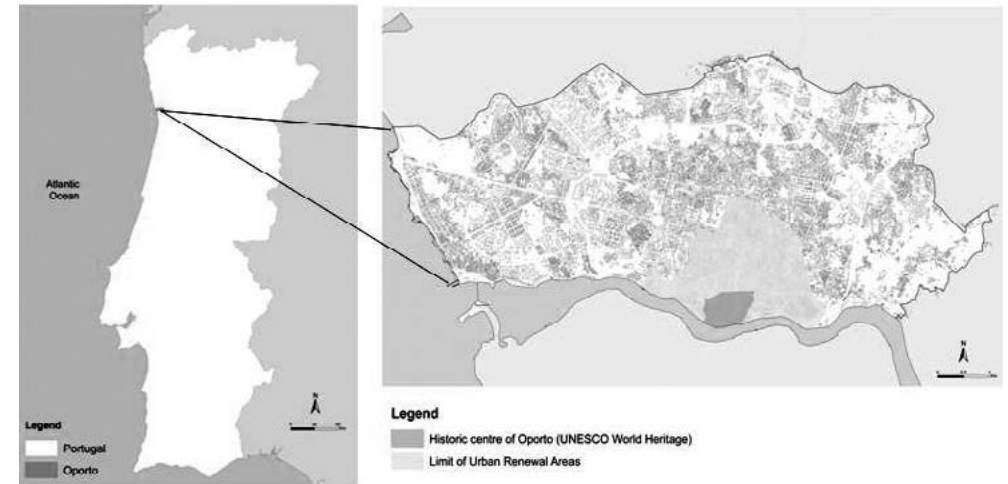
However, as is characteristic of European cities, retail sector is linked to Oporto from its beginning, being a key aspect in understanding the development of city in general and in particular of its centre (Fernandes 1997).

It is our aim to analyze bottom-up initiatives of economic entrepreneurship in Oporto city centre retail sector. Our objects of study are fixed establishments, fairs and markets.

In terms of geographical area of reference, it should be noted that there is no defined and agreed limit of the centre of Oporto.

In Figure 2, we can see the limit of Historic Centre of Oporto (UNESCO World Heritage since 1996) and the limit of Urban Rehabilitation Areas defined by the municipality. City centre is considered broader than the Historic Centre but not as extensive as the limit of Urban Rehabilitation Areas. In this work we consider the limit of Urban Rehabilitation Areas as city centre because it would be reductive and misleading choose the lowest limit.

Figure 2 – Location of Oporto and its centre



Source: Produced by authors

In terms of methodology, it should be noted that there is no statistical information related to the topic available to our analysis scale, so that could not be tested indicators referred in scientific literature. Our results are based in 24 semi-structured interviews, made during 2015, to entrepreneurs of different types and formats of economic activity. Respondents were owners, managers or employees of fixed establishments and responsible for management and organization of urban markets. Once the centre of Oporto is diverse in terms of establishments opening date, having also centenarians business, they were interviewed older establishments and establishments recently opened (Figure 3). The goal is to analyze the features of recent business in what concerns to relationship with consumers, entrepreneurship and innovation as well innovation and adapting strategies to new consumer expectations in the case of business that endure for decades. It is considered old business those that opened during the last century.

We used content analysis to analyze the interviews. This is considered one of the most elaborate techniques in the field of documentary observation (Bravo 1994).

We also used direct observation. It was used a framework with aspects on which it was intended to gather information.

Results

In Oporto city centre, recent years are marked by new dynamics in terms of strengthening and diversification of the hotel establishments, the revitalization of coffees and restaurants, the diversification of street commercial establishments and the promotion of urban markets and craft fairs. There has been an increasing number of establishments that not only have the product commercialization component but also, associated with it, there is a cultural and entertainment component. We refer for example bars and nightclubs that have spaces suitable for holding live concerts and diversified art exhibitions (Figure 4).

In what concerns to the fixed establishments, in the oldest ones there is majority a family heritage, the management passes from parents to children who want to continue a profitable business. In the case of the most recent establishments, respondents reported that the opening of business was due, in some cases, to situations of unemployment or precarious employment and, in other cases, because they work in the type of economic activity concerned or because they are somehow linked to that activity, aspiring to have their own business where they could apply their ideas.

The so-called fairs and urban markets, with more modern and innovative characteristics, began to emerge in 2009 in Oporto. They differ from traditional fairs and markets because of products marketed, the promotion of small businesses and brands, the animation associated to them and because they bring new audiences and experiences to urban spaces (Figure 5). Their achievement arises from the awareness that there was a shortage in Oporto of similar initiatives to those observed in other European cities. The main objective behind the organization effort of the markets relates generally to the stimulation of urban spaces, the revitalization of more or less forgotten areas and to the promotion of recreational and cultural activities of squares or streets, generating flows of people - residents, visitors and tourists - and attracting new audiences, new business, new experiences.

In the case of the oldest business establishments, expectations surrounding them focus on to succeed, create jobs, become increasingly known and keep pace with the new demands of consumers in order to increase or at least maintain customers. Newer businesses have the same expectations, however are still in process of affirmation and recognition of the business. The respondents refer that there are opened many properties in recent years, which it is positive, on one hand, because reflects significant economic dynamics of city centre; on the other hand, it creates more uncertainty because it represents in many cases competition.

In terms of difficulties in the implementation of the business idea, respondents particularly stress the lack of investment capacity, the difficulty of funding access and the excessive bureaucracy in licensing (we are talking about establishments opened before legal rules that facilitated the creation of business) and the high tax burden. The high rent of spaces that are practiced in city centre is referred as another difficulty, particularly by newer establishments. The oldest establishments reported that the opening of large shopping centers in the past was a challenge by their strong competition. Respondents related to urban markets indicate that in implementing its initiative they experienced difficulties with obtaining the necessary licenses, considered a very bureaucratic process. Today, the weather is a problem for outdoor markets and is not always easy to find appropriate locations - either because they are private and the owners have

no interest in letting occupy the space, or because the spaces are small or even, in the case of public spaces, the municipality is not always in accordance with the chosen locations. Finally, they refer the lack of financial support as an obstacle in improving the conditions of events, both for sellers as to shoppers and other visitors, and the lack of an effective and efficient public strategy of boosting the urban fairs and markets.

When asked what they consider most innovative in their business, respondents of the oldest establishments report that is the ability to combine tradition and innovation, that is keep the old customers loyalty and the traditional character of the property at the same time that are up to date in what concerns to the needs and expectations of customers and to the modernization of services and technologies associated with the selling process. This last aspect is also highlighted in the more recent business inquired. The quality of products and services, the sale of original products or products with a distinguishing feature, the creation of a warm and pleasant environment are the most mentioned aspects by respondents related to the most recent establishments and to the markets.

The location in the city centre brings advantages derived from the centrality of the area, particularly in terms of the high concentration of shops and services and, to that extent, a large supply area is more prone to an increased demand. The flow of people is greater and the potential number of customers is naturally higher.

Tourists generate a greater flow of people and strengthen the economic activity of city centre. The older, traditional and well established retail establishments (like grocery stores, herbalists, pharmacies, jewelry shops or bookstores) do not consider to have great benefits of these positive dynamics, with the exception of the flagship establishments (such as Lello Bookstore for example) that are themselves tourist attractions. Recent hotel establishments (and we refer particularly the hostels) opened because of the opportunities created by the increasing tourist attractiveness of the centre in recent years and currently benefit from this same attractiveness.

Personal and business networks are valued as ways to access the support they need or the information necessary to originate added value for their business. In the case of urban markets, the connection with the surrounding community and, in particular, establishments in the area, is a constant concern in order to generate mutual gains. The establishment of social relations between sellers, between them and clients or even among people who are in the events, is considered a positive impact of the markets. Responsible for markets aim to promote contact between people and business, to create conditions for the establishment of personal and professional networks that could result in future connections and also to create an environment conducive to the emergence of new ideas. Urban markets are seen as environments of commercial trading, but also of creativity, innovation, interaction and cultural activities.

The vast majority of respondents stated that they had no institutional support and don't miss it; three respondents reported having the support of Oporto Merchants Association, which they consider very important; the three respondents responsible for organizing the urban markets have support from the municipal company *Porto Lazer* (with technical issues - sound and power - and bureaucratic issues, like granting of licenses for use of the spaces, as well as with dissemination of the markets), considering this an essential support that should be strengthened. Only one respondent reported having institutional support from a specific association related to his type of economic activity.

When asked what kind of support municipality could give to contribute to the development of their business in particular and the economic activity of the city centre in general, the most mentioned aspects respondents refer are the financial support, particularly for the rehabilitation of buildings, that in many cases are very degraded and thus unattractive at the outside; the availability of free parking or parking at more affordable prices than those currently practiced; the bureaucratic simplification and the increased security on the streets. It should be noted that four of the respondents mentioned that whenever contacted municipality requesting support it has been demonstrated willingness to collaborate and there was in fact effective support by the municipality of Oporto.

Figure 3 – Old and new economic activity establishments in Oporto city centre



Source: Authors, 2015

Figure 4 – Homepage of internet pages of bars / nightclubs with cultural activities



Source: Internet pages of Plano B (left) and Maus Hábitos (right), June 2015

Figure 5 – Urban markets in Oporto city centre



Source: Authors, 2015

Conclusions

Since the 90s of twentieth century, the dynamics and impacts of economic globalization became particularly evident in cities of developed countries, occurring the affirmation of local on global and of global on local – the phenomenon of glocalization.

Urban planners, economic geographers and policy makers recognize that the factors underlying the economic growth of cities are increasingly intangible and of increased mobility. There is also the recognition that innovation is a cyclical process, resulting from interaction of different actors in networks. In these times of economic-financial crisis it has been promoted a new approach of urban management, with a strong link between the regeneration of the city centre and the resilience of the retail sector. On the same street where the same policies and the same cultural contexts are applied, we can find different answers from retail entrepreneurs and different reactions / actions by consumers. The characteristics of entrepreneurs, their networks and capacity of investment, innovation and anticipation of change are key aspects of designing and implementing successful adaptation strategies, with consequences for the decline or prosperity of retail areas in the urban context.

Consumers are constantly renewing their needs, desires and expectations, changing their behavior and lifestyles. This has direct consequences for retail activities, challenging entrepreneurs to keep up to date with customer's trends. The scientific literature explains entrepreneurship as a product of local context and characteristics of individuals. The territories are endowed with different infrastructures of knowledge, institutions and resources. Individuals are heterogeneous with regard to knowledge, skills, values and preferences that guide their motivations and behaviors. Thus, the entrepreneurship process depends on the opportunities offered by the territories and the capacity and motivation of individuals to identify, evaluate and exploit these opportunities.

Our focus in this work was the analysis of bottom-up initiatives of economic entrepreneurship in Oporto city centre retail sector. Our research was based on 24 interviews and direct observation of fixed establishments, fairs and markets. We conclude that coexist in Oporto city centre different situations: the situation of those who have inherited a family business, adapting it over time to the needs and expectations of consumers; the situation of those who opened more recently a business because in a situation of unemployment or job insecurity or because they wished to have their own business. There is also the situation of those who, through observation of other European cities, have taken the initiative to organize and manage urban markets, aware of a gap at this level in our study area. The latter two situations clearly show an entrepreneurial spirit, of who identifies and takes advantage of opportunities created by the current economic dynamics, largely powered by the growing importance of tourism in the city in general and in its centre in particular. Respondents denote the concern on keep up to date in what concerns meet the needs and expectations of consumers. In older business is also the concern to update the technologies associated with the selling process.

Consumers are actors of economic initiatives, in that nowadays they experience while shopping. The innovation strategies of entrepreneurs pass through providing experiences, by creating pleasant establishment environments, inviting to fruition, apart from the innovation in terms of products (new or with differentiating characteristics), forms of marketing and cultural

and playful animation of spaces. This is particularly clear in the case of bottom-up initiatives related to fairs and urban markets where music, dance and other art demonstrations are almost always present.

A last idea, it should be noted that entrepreneurship stems from an identity development strategy supported on empowerment of agents, upon their resources and possibilities of intervention, in order to improve their living conditions. It is also important to note the importance of do-it-yourself that underlies many of the initiatives, based on the possibility of making part of stakeholders, taking into their own hands the destiny of their lives. For example, many of the hostels are born of this principle, but also many bars / concert halls and art galleries or urban markets. The issues of innovation, knowledge, information and learning are critical in these empowerment processes.

References

- Alexander, A. T. & Martin, D. P. 2013, 'Intermediaries for open innovation: A competence-based comparison of knowledge transfer offices practices', *Technological Forecasting and Social Change*, vol. 80, no. 1, pp. 38-49.
- Audretsch, D. B. 2015, 'Joseph Schumpeter and John Kenneth Galbraith: two sides of the same coin?', *Journal of Evolutionary Economics*, vol. 25, no. 1, pp. 197-214.
- Bailey, N. & Madeleine, P. 2015, 'Can the State Empower Communities through Localism? An Evaluation of Recent Approaches to Neighbourhood Governance in England', *Environment and Planning C: Government and Policy*, vol. 33, no. 2, pp. 289-304.
- Barata-Salgueiro, T. 2014, 'Retail planning and urban resilience – An introduction to the special issue', *Cities*, vol. 36, pp. 107-11.
- Barreta, J. junho 2012, *Comércio de proximidade e regeneração urbana*, CIP – Confederação Empresarial de Portugal.
- Bathelt, H. & Glückler, J. 2003, 'Toward a relational economic geography', *Journal of Economic Geography*, vol. 3, no. 2, pp. 117-44.
- Boschma, R. & Martin, R. 2010, *The Handbook of Evolutionary Economic Geography*, Edward Elgar.
- Bosma, N. & Sternberg, R. 2014, 'Entrepreneurship as an urban event? Empirical evidence from European cities', *Regional Studies*, vol. 48, no. 6, pp. 1016-33.
- Bravo, R. S. 1994, *Técnicas de Investigación Social: Teoría y Ejercicios*, Editorial Paraninfo S.A., Madrid.
- Cachinho, H. 2014, 'Consumerscapes and the resilience assessment of urban retail systems', *Cities*, vol. 36, pp. 131-44.
- Camagni, R. & Capello, R. 2013, 'Regional innovation patterns and the eu regional policy reform: Toward smart innovation policies', *Growth and Change*, vol. 44, no. 2, pp. 355-89.
- Caragliu, A., Del Bo, C. & Nijkamp, P. 2012, 'A map of human capital in European cities', in *Creative Knowledge Cities: Myths, Visions and Realities*, Edward Elgar Publishing Limited, Cheltenham (UK), pp. 213-50.
- Carayannis, E. & Grigoroudis, E. 2014, 'Linking innovation, productivity, and competitiveness: Implications for policy and practice', *Journal of Technology Transfer*, vol. 39, no. 2, pp. 199-218.
- Carayannis, E. G. & Campbell, D. F. J. 2011, 'Open Innovation Diplomacy and a 21st Century Fractal Research, Education and Innovation (FREIE) Ecosystem: Building on the Quadruple and Quintuple Helix Innovation Concepts and the "Mode 3" Knowledge Production System', *Journal Of The Knowledge Economy*, vol. 2, no. 3, pp. 327-72.
- Carvalho, L., Santos, I. P. & Van Winden, W. 2014, 'Knowledge spaces and places: From the perspective of a "born- global" start-up in the field of urban technology', *Expert Systems with Applications*, vol. 41, no. 12, pp. 5647-55.
- Castaño, M.-S., Méndez, M.-T. & Galindo, M.-Á. 2015, 'The effect of social, cultural, and economic factors on entrepreneurship', *Journal of Business Research*, vol. 68, no. 7, pp. 1496-500.
- CE 3/03/2010, 'EUROPA 2020: Estratégia para um crescimento inteligente, sustentável e inclusivo', Comissão Europeia, Bruxelas, p. 39.
- CE 31/01/2013, 'Comunicação da Comissão ao Parlamento Europeu, ao Conselho, ao Comité Económico e Social e ao Comité das Regiões: Criação de um Plano de Ação Europeu para o Setor Retalhista', Comissão Europeia, Bruxelas, p. 22.
- Dabic, M., Cvijanović, V. & González-Loureiro, M. 2011, 'Keynesian, post-Keynesian versus Schumpeterian, neo-Schumpeterian: An integrated approach to the innovation theory', *Management Decision*, vol. 49, no. 2, pp. 195-207.
- Estrin, S., Korosteleva, J. & Mickiewicz, T. 2013, 'Which institutions encourage entrepreneurial growth aspirations?', *Journal of Business Venturing*, vol. 28, no. 4, pp. 564-80.
- Fernandes, J. A. V. R. 1997, *Porto: Cidade e Comércio*, Arquivo Histórico da Câmara Municipal do Porto, Porto.
- Fernandes, J. R. & Chamusca, P. 2014, 'Urban policies, planning and retail resilience', *Cities*, vol. 36, pp. 170-7.
- Fujita, M. & Krugman, P. 2004, 'The new economic geography: Past, present and the future', *Papers in Regional Science*, vol. 83, no. 1, pp. 139-64.
- Galindo, M.-Á. & Méndez, M. T. 2014, 'Entrepreneurship, economic growth, and innovation: Are feedback effects at work?', *Journal of Business Research*, vol. 67, no. 5, pp. 825-9.
- García, A. B. 2014, 'Analyzing the determinants of entrepreneurship in European cities', *Small Business Economics*, vol. 42, no. 1, pp. 77-98.
- Huizingh, E. K. R. E. 2011, 'Open innovation: State of the art and future perspectives', *Technovation*, vol. 31, no. 1, pp. 2-9.
- Johannessen, J.-A. & Olsen, B. 2010, 'The future of value creation and innovations: Aspects of a theory of value creation and innovation in a global knowledge economy', *International Journal of Information Management*, vol. 30, no. 6, pp. 502-11.
- Leydesdorff, L. 2012, 'The Triple Helix, Quadruple Helix, ..., and an N-Tuple of Helices: Explanatory Models for Analyzing the Knowledge-Based Economy?', *Journal Of The Knowledge Economy*, no. 3, pp. 25-35.
- Leydesdorff, L., Dolfsma, W. & Van Der Panne, G. 2006, 'Measuring the knowledge base of an economy in terms of triple-helix relations among "technology, organization, and territory"', *Research Policy*, vol. 35, no. 2, pp. 181-99.
- Leydesdorff, L. & Meyer, M. 2006, 'Triple Helix indicators of knowledge-based innovation systems: Introduction to the special issue', *Research Policy*, vol. 35, no. 10, pp. 1441-9.
- Leydesdorff, L. & Meyer, M. 2007, 'The scientometrics of a Triple Helix of university-industry-government relations (Introduction to the topical issue)', *Scientometrics*, vol. 70, no. 2, pp. 207-22.
- NABMA Sem data, 'A toolkit for setting up a local market', National Association of British Market Authorities, p. 26.
- Nijkamp, P. & Kourtit, K. 2013, 'The "New Urban Europe": Global Challenges and Local Responses in the Urban Century', *European Planning Studies*, vol. 21, no. 3, pp. 291-315.
- Papadopoulos, T., Stamati, T., Nikolaidou, M. & Anagnostopoulos, D. 2013, 'From Open Source to Open Innovation practices: A case in the Greek context in light of the debt crisis', *Technological Forecasting and Social Change*, vol. 80, no. 6, pp. 1232-46.
- Quatenaire 2000, 'Programa de Revitalização do Comércio e Serviços na Baixa Portuense: Estudo Global', Quatenaire Portugal, Porto, p. 240.
- Robertson, P. L., Casali, G. L. & Jacobson, D. 2012, 'Managing open incremental process innovation: Absorptive Capacity and distributed learning', *Research Policy*, vol. 41, no. 5, pp. 822-32.
- Saari, E., Lehtonen, M. & Toivonen, M. 2015, 'Making bottom-up and top-down processes meet in public innovation', *The Service Industries Journal*, vol. 35, no. 6, pp. 325-44.
- Salavisa, I. & Fontes, M. 2012, *Social Networks, Innovation and the Knowledge Economy*, Routledge.
- Seixas, J. maio 2013, *A Cidade na Encruzilhada: Repensar a cidade e a sua política*, Edições Afrontamento.
- Simón-Moya, V., Revuelto-Taboada, L. & Guerrero, R. F. 2014, 'Institutional and economic drivers of entrepreneurship: An international perspective', *Journal of Business Research*, vol. 67, no. 5, pp. 715-21.
- Soetanto, D. P., Taheri, M. & van Geenhuizen, M. 2012, 'Social capital's and absorptive capacities' impact on new ventures' growth', in *Creative Knowledge Cities: Myths, Visions and Realities*, Edward Elgar Publishing Limited, Cheltenham (UK), pp. 251-72.

Sorescu, A., Frambach, R. T., Singh, J., Rangaswamyd, A. & Bridges, C. 2011, 'Innovations in Retail Business Models', *Journal of Retailing*, vol. 87S, no. 1, pp. S3-S16.

Taylor, S. 2015, 'A new mystique? Working for yourself in the neoliberal economy', *Sociological Review*, vol. 63, no. S1, pp. 174-87.

URBACT margo 2015, 'Urban markets: heart, soul and motor of cities', p. 104.

van Geenhuizen, M. & Nijkamp, P. 2012, 'Creative cities in a knowledge society: introduction', in *Creative Knowledge Cities: Myths, Visions and Realities*, Edward Elgar Publishing Limited, Cheltenham (UK), pp. 1-19.

CHAPTER 8

Technological Learning: Experience Curve as a Resilient Learning Mechanism

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Introduction

Literature on knowledge has evolved significantly since the pioneering works of Paul Romer, becoming multi-faceted. Theories of knowledge acquisition suggest that organizations facing similar changes vary in their capacity to learn due to cognitive (Senge, 1990), interpersonal (Argyris and Schon, 1978), structural (Duncan and Weiss, 1979), or managerial (Dutton and Thomas, 1984) factors, and even fail to learn (Hirsch, 1952). In general terms, researchers have all come to a general consensus that, when pursuing a development goal, embodying knowledge should be a priority task in modern organisations.

Thus, it is not surprising that, more recently, management literature has been focused on the management of organisational knowledge including the intangible dimensions of the organisation (Von Krogh *et al.*, 2001), and has been conducted within the frameworks provided by economic theories¹. Therefore, there is now a clearer understanding of the nature of knowledge (relationships between data, information and knowledge; between tacit and explicit knowledge; between individual and organization knowledge; between types of thinking), and of the dynamics of knowledge (knowledge acquisition and learning mechanisms, knowledge conversion, knowledge dissemination and knowledge application) in organisational contexts.

Eventually, knowledge accumulation in firms should lead to cost reductions and rising revenues, and from a micro-economic perspective, and assuming the positive contribution of firms for the dynamics of socio-economic change (Schumpeter, 1947), the economic evolution is a process of continuous cumulative learning (Rothschild, 2004).

The cumulative learning can be quantitatively captured in a so-called 'learning curve' (LC). The LC concept is based on the empirical observation that the costs of a product fall by a constant proportion with every doubling of cumulative production. Nowadays, the dominant stream of literature of the knowledge management (KM) science assumes that these cost reductions reflect, not only the benefits from learning-by-doing, but also the benefits derived from other types of learning mechanisms, such as learning-by-using, learning-by-searching, learning-by-interacting, and more recently learning-by-learning and learning-by-expanding. All the learning

¹ Economics theories such as the resource-based view, the competence-based view, cognitive frameworks theory, the capability perspective, or dominant logics.

mechanisms play a different, thus relevant, role in the learning organisation, and their effects are collectively reflected in the experience accumulation. The concept 'experience curve' (EC) is based on the intuitive idea that the time required to perform a task decreases as a worker gains experience (BCG, 1968, 1972, 1974).

One could argue that "riding down"² the EC will bring short-term profits while accumulating experience by producing the same old product, but this simplistic vision masks the forcefulness of innovation and knowledge accumulation. In fact, firms need to be focused on re-enforcing their own competencies, not only to embody as much experience and knowledge as possible to achieve a rapid unitary cost reduction in the same product, but if possible, transferring this to new challenging outputs for the permanent changing consumer preferences. After all, the market decides the final form of the production function through an intense and interactive process of innovation. The learning associated with innovative activities is not a purely individual phenomenon, for the increasing complexity of innovation it is required a collective and interactive process. Several researchers have even looked at consumers as co-creators of products and value (Prahalad, 2004), as co-innovators (Von Hippel and Katz, 2002), and as 'prosumers'³ who both produce and consume (Xie *et. al.*, 2007).

Indeed, innovation is highly influenced by vertical cooperation, not only with consumers, but also with suppliers and customers, especially in low-tech firms where the development of new products or processes often takes into account new demands and market changes (Vaz and Nijkamp, 2009). Companies that are better able to utilise information and knowledge can make decisions faster and closer to the point of action, overcome internal and external barriers, provide more opportunities to innovate, reduce product development time and enhance customer relationships (Hackett, 2000).

Firms learn differently, depending on several endogenous and exogenous factors and time-dependent stages, and through distinctive learning mechanisms. Theoretically, if knowledge can be managed (Alavi and Leidner, 2001; Chen and Chen, 2006), experience and knowledge accumulation could be accelerated via KM through differentiated learning mechanisms promotion, improving the pace of innovative activities. If innovation is rapidly endogenised, the firm is ready and prepared to shorten the innovative lag-phase and launch another innovation.

But in this complex process, the idea of learning as a driver of cost reduction still remains very attractive. Learners (or workers) become better at doing what they do over time, leading to efficiency increases and permanent cost reductions, at a profit business level. The implications of both "practice makes perfect" and "performance improves with experience" effects have held up remarkably well over time (Pisano *et al.*, 2001), and are reflected on the EC concept.

² The expression "riding down" was borrowed from Jakob and Madlener (2004).

³ The term 'prosumer' is a late 20th century concept that combines some of the common characteristics of a producer and a consumer, and is generally applied to situations where consumers are considered to have reached a level of sophistication and such a strong working knowledge, that the consumer can effectively dictate the production or re-design of goods and services. More information about the 'prosumer' concept can be found elsewhere (Prosumer Studies Working Group at <http://www.bsos.umd.edu/soc/prosumer/about.html>).

Theoretical Framing and Discussion

A case-study approach was chosen as the main research methodology. Related to a particular biotechnology, the Microalgae Production Systems (MPS) that have been installed and in operation in the company Necton – Companhia Portuguesa de Culturas Marinhas S.A. (Necton, hereinafter), a pioneering Portuguese company. It is a unique experiment as it is the first time to examine the EC of MPS and provide a promising contribution into long-term research in a transversal field of linking technological processes to economic and management sciences.

The model we pursue is based on the following analytical sequence: i) Organisational learning mechanisms such as described in *Table 1*, where the different conceptual approaches are listened; ii) Learning and experience curves resulting from gains in learning by doing; iii) the upcoming of competitiveness of new and innovative products and processes; iv) How can modelling and policy support decision tools be effective.

i) Organisational learning mechanisms

As summarised in *Table 1*, organisational knowledge can be acquired in different ways, through formal research and work development, or through learning as doers or users. But surprisingly, and even though users intensively influence the innovation process, the learning-by-using mechanism has not been studied enough. Although Rosenberg (1982) has highlighted the critical role of the 'user learning' for several technologies, this field has received little empirical attention.

More recently, the concept of "communities of practice"⁴ (COP) has become increasingly influential within the KM literature. COP are "groups of people who share a passion for something that they know how to do and who interact regularly to learn how to do it better" (www.ewenger.com). Intentionally created, COP are currently being used to facilitate knowledge transfer within firms, as the tacit aspects of knowledge are often the most valuable, as they consist of embodied expertise (Ramalho and Sarmiento, 2004). Furthermore, presently, codified knowledge is losing part of its strength as a source of competitive advantage, and tacit knowledge is reinforcing its significance as a mean of adapting to new requirements and therefore, spatial proximity to sources of relevant knowledge creation is becoming central (Vaz and Nijkamp, 2009).

⁴ The COP concept was originally developed by Lave and Wenger (1991) in a study of situated learning.

Table 1 – Organisational learning mechanisms

Learning Mechanism Bibliographic References	Brief Description
Learning-by-doing (Arrow, 1962)	Learning from experience in production processes. Know-how produced by experience can be regarded as tacit knowledge, residing in individuals, organisational routines and manufacturing practices. Also described as first-order learning.
Learning-by-searching (Boulding, 1985) (Johnson, 1992)	Knowledge brought forward by R&D. Knowledge more concentrated on “know-why”; knowledge development on general concepts and principles.
Learning-by-using (Rosenberg, 1982)	Solutions are found in practice and optimised according to experience. Also described as “know-what”.
Learning-by-interacting (Foray & Lundval, 1998)	Knowledge transfer between users, producers, research institutes and policy makers. Knowledge transfer is more intense whenever relevant information is exchanged. Also described as “know-who” knowledge.
Learning-by-learning (Rotmans and Kemp, 2003)	Primary learning processes improve over time, and more intensively if learning strategies are developed, applied and evaluated. Also described as reflexive learning or second-order learning.
Learning-by- expanding (Schaeffer, 2004)	If a process/technology is frequently applied, more actors, organisational structures and industrial sectors will become involved in, focused on, dependent on and adapted to the new technology. Also described as “learning-by-expanding” or “learning-by-network growth” or “learning-by-embedding”.

Source: Own elaboration

ii) Learning and experience curves resulting from gains in learning by doing

Learning and experience curves analyses result from LC models initially developed from the basic premise that individuals and organisations acquire knowledge by doing work. More recently, it has been proposed that organisations learn by using, interacting, searching and expanding. Thus, through different learning mechanisms, organisations and individuals develop relatively permanent changes in behaviour, accumulating experience. As more products are produced by a manufacturer, the cost per unit of the product often decreases at a determined rate. This phenomenon is represented by an exponential curve, also known as the EC. The organization gains a competitive advantage when it converts the cost reductions into productivity gains. However, the trickiest attribute of experience accumulation is its strategic importance, due to the fact that experience cannot be traded.

As learning is often equated with experience, the terms LC, EC, “progress curve”, and “learning-by-doing curve” are frequently used interchangeably. Generally, the term EC is more of a macro-concept, while the term LC is a micro-concept. The term LC refers to the phenomenon that unit production costs typically decrease over time, and the LC effects are considered

restricted to learning effects of the workers (learners). In contrast, the EC effects comprise learning effects of the whole firms and entire industries, such as learning through research and learning through scale-production and up-scaling of individual products (IEA, 2000).

iii) The upcoming of competitiveness of new and innovative products and processes

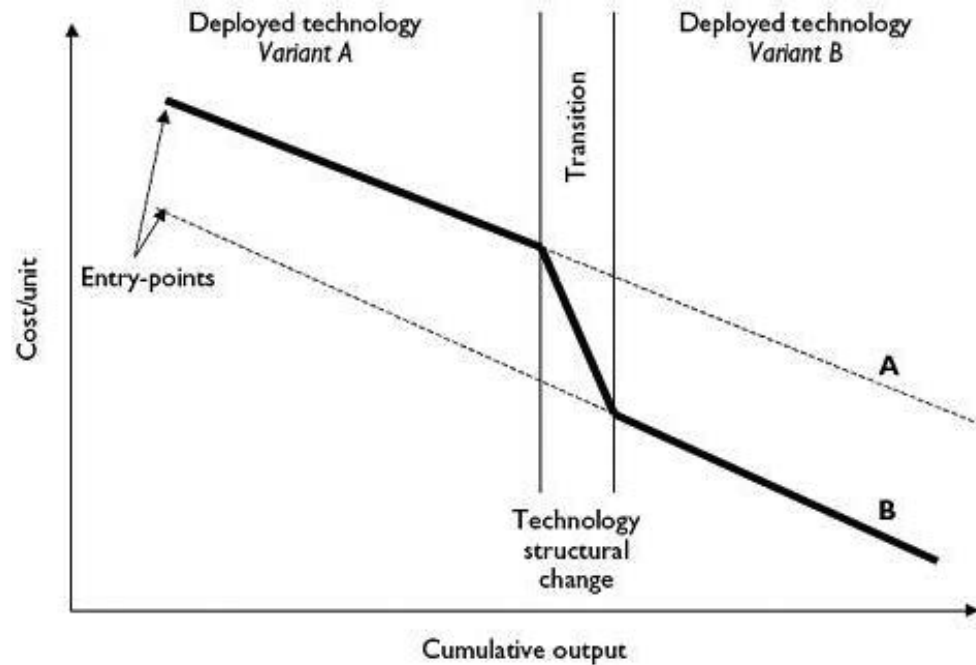
Competitiveness of new and innovative products and processes are essential to innovative occurrence and several classical definitions of innovation can be found in the literature (e.g. Utterback, 1994; Frascati Manual, 2002; Oslo Manual, 2005). Nevertheless, almost all definitions include the concepts of novelty, commercialisation and/or implementation. In other words, if an idea has not been developed and transformed into a product, process or service, or it has not been commercialised, it should be classified as an innovation.

Sure, the way innovative technologies develop and diffuse is characterised by various stages, from invention to widespread implementation. Different learning mechanisms play a role in each of these stages. The learning process will lead to technological change and to cost reductions (Neij *et al.*, 2003; Junginger, 2004, 2005). Therefore, the EC approach can help to measure and quantify the aggregated effect of technological development and should not be neglected.

A technological discontinuity, also called radical innovation, marks the onset of a new technology. It is “based on a different set of engineering and scientific principles and often opens up whole new markets and potential applications” (Henderson and Clark, 1990). In consequence of the occurrence of a technological discontinuity, the EC can come to an abrupt stop (*see Figure 1*). This event is represented graphically by a curve truncation. Whenever such a phenomenon is identified, a red alert should be displayed in the ‘competition monitoring device’ of the firm, which means that existing processes become obsolete and the firm should upgrade to remain competitive. The upgrading will mean that the old EC will be replaced by a new one.

An important implication of the EC, related with technological discontinuity, is that increasing accumulated experience in the early stages of a technology will create the possibility of developing a ‘dominant design’ (BCG, 1972). A ‘dominant design’ is a technology management concept that identifies key technological designs that become the standard in their market place. Firms will introduce alternative designs until some combination becomes clearly preferred by end-users and widely accepted as an industry standard (Anderson and Tushman, 1990). Eventhough, the EC offers no method to predict discontinuities in the learning rate or the eventual occurrence of a dominant design, it may help at least to identify future barriers that could lead to technological discontinuities, and point out critical R&D areas. A technological discontinuity appears in the form of a double knee. Figure 1 illustrates a step in the EC, indicating a change in the entry point and possibly also in the progress ratio before and after the change (IEA, 2000).

Figure 1 – Technological discontinuity



Source: IEA (2000)

The 'technology variant A' is deployed, but during the transition period investors realise the advantages of 'technology variant B'. As the two technology variants are assumed to be similar, in the transition period for 'technology variant B', there is experience accumulation from the learning process that occurred during 'technology variant A' deployment (IEA, 2000).

Emerging technologies pass through several stages before they mature, encompassed by different learning mechanisms. Among the different organisational learning mechanisms, in order to achieve an increased market penetration of a technology, learning-by-searching is the most dominant mechanism in the early phase of technology development (Van Sark, 2008). It also often plays an important role at later stages, as well, as the effect of R&D on an industry's capacity to decrease cost is analogous to experience, because it brings dynamism to economies or downward shifts in the cost curve (Papineau, 2006).

In the case of niche-market applications, for instance of new technologies, the learning-by-doing mechanism will ultimately promote innovation in the form of continuous improvement. Foray (2006) claims that, at the micro-economic level, learning-by-doing can be related to innovation and knowledge production. The researcher also points out the fact that learning-by-doing should not be confused with incremental innovation, because while learning-by-doing generates only technological or organisational increments, most incremental innovations are produced only through learning-by-doing mechanisms. After, the initial development phase,

whenever technology diffusion takes place it leads to learning-by-interacting, and, from that point on, to the last stage of mass production.

The learning process is a result of the development of increasing skill in production, being therefore a source of innovation that is recognised as a component of the R&D process and receives no direct expenditures (Foray, 2006).

As the process of innovation is inherently uncertain, prospects for future learning with existing technologies do not consider breakthroughs (i.e., through R&D investments) and market developments. One has to be cautious when using EC for innovation forecasting purposes. The simplistic use of industry-wide EC can easily mask the underlying dynamics of the process of innovation. It would be wise only to use EC whenever incremental innovations are inferred as simplification and improvement activities, and avoid using EC for domains where radical innovations may take place.

Another drawback of EC, indirectly pointed out by Peter Senge (1990), is the "core learning dilemma" that confronts organisations – organisations learn best from experience but never directly experience the consequences of many of the organisational strategic decisions.

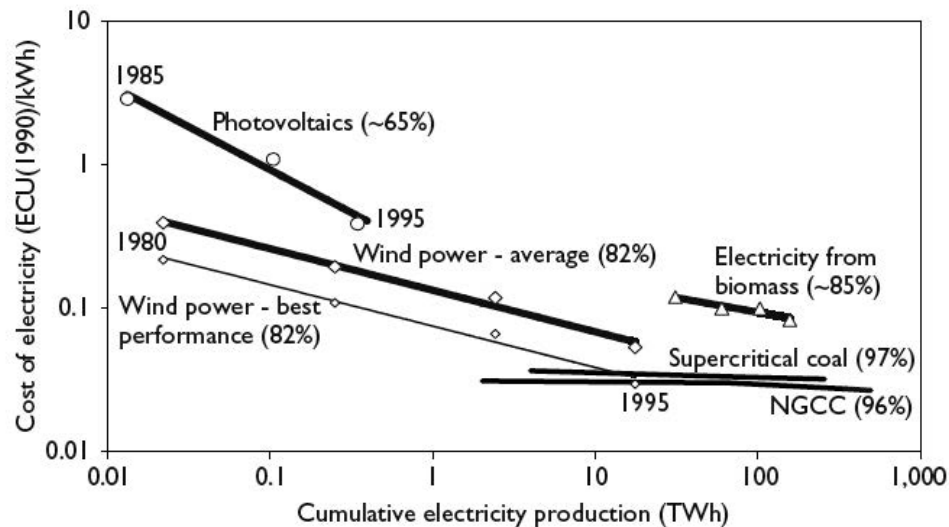
In an attempt to understand technical complexity of microalgal biotechnology, the learning process, underlying technology development, was studied through different research questions: 1. Do the MPS of the case-study follow an experience curve? 2. Do closed and open MPS follow similar experience curves? 3. Do learning mechanisms play different roles across the MPS life-cycle?

In order to answer these questions, two methodologies were applied to the case-study. The first methodology was based on the EC concept, and its application aimed to answer whether or not the MPS followed an EC.

iv) How can modelling and policy support decision tools be effective

Newfound interest in EC has arisen in recent years, not only as before, as a production planning or strategic management tool, but more recently with a focus on achieving reliable estimates of technological learning rates as inputs in technology forecasting models used for decision-making for government policies (IEA, 2000; Hettinga *et al.*, 2009; Van den Wall Bake *et al.*, 2009; Weiss *et al.*, 2010). For instance, figure 2 illustrates the use of learning opportunities in the power sector in the European Union (EU).

Figure 2 – Cost of electricity, electricity produced and PR from selected electric technologies installed in the EU, from the year 1980 to the year 1995 (NGCC stands for Natural Gas Combined Cycle)



Source: IEA (2000)

Even though, several national energy policies face controversy as electricity customers are paying more for subsidizing wind farms, surprisingly, according to IEA (2000), electricity from wind produced at the sites, with best performance, can today compete with electricity produced in coal-fired power plants; photovoltaics and biomass technology require considerable improvements in performance before electricity from these technologies can compete with electricity from fossil fuel technology.

Technological policy decisions should always be supported by reliable estimation and technology cost forecasts. It is no longer plausible to use the EC methodology to estimate cost patterns on the basis of a price proxy. It is obvious that new approaches are needed to attenuate or solve the EC methodology limitations.

Several works have used LC as important tools for technical change modeling and policy making support. Duke and Kammen (1999) provided a method for evaluating the cost effectiveness of public policies to support new technologies. Van der Zwaan and Rabl (2004) have weighted public technology investment against environmental damage costs.

More recently, other works have pointed to the significant uncertainties of key parameters (Wene, 2000). LC must be used with caution, when inadequately applied, as they may lead to inappropriate public policies (Papineau, 2006). The importance of caution when applying EC in early stages of market dynamics for photovoltaic, fuel cell, carbon capture and sequestration technologies can be stressed as well. Nevertheless, it is important to keep in mind that LC are a heuristic measure, without a solid theoretical basis.

Results and conclusion

Observing, analysing and reengineering the MPS, or any other innovative sector of the economic activity, in order to apply knowledge and experience accumulation in technological adaptations, is constantly required. Therefore, the deeper the knowledge is, and the broader the experience, the better technologies will work out. For that reason, Necton is an interesting case-study, as it has been producing microalgae, in a large-scale, since the year 2000, offering the possibility to medium-long term observation periods.

For the purpose of the present study, only one biotechnological perspective was explored, regarding the fact that MPS technological performances are largely affected by environmental parameters. This relational connection with the productive environment is a must. In order to understand how environmental factors may have affected the biomass productivity, for example, some parameters were studied in a concise in order to allow that data, regarding environmental parameters could be compiled and summarised the minimum and maximum values observed of each parameter, as well as the month and year. Only the inclusion of such values in the investigation may detect if costs decreased, indeed, by increasing the cumulative production. In our case these decreased 34.4% for each doubling of cumulative production – a very expressive result. Both PR obtained are in between the determined PR values for manufacturing industry (Dutton and Thomas, 1984) and for energy technologies (McDonald and Schrattenholzer, 2001), that range from 60 % to 100%.

Therefore, several conclusions arise from this finding: a “regular” learning process occurred along technology instalment and operation; the EC found exclusively resulted from the learning effects experienced, as no scale effects occurred during firm’s activity; the learning and experience accumulation from previous technologies installation and daily operation resulted in higher learning in subsequent technologies. Even though the methodology was successfully applied, as progress ratios were determined, the longer the technology is producing, the better the curve fits the EC, and the overall learning process is better understood.

For future research in this field, it would be interesting to know what is the goal, in terms of techno-economic performance of each type of productive activity or in other words, what is the maximum production that managers can aspire, and what is the best PR, and what scenarios may lead to it. These calculations could be pursued using the EC methodology as a cost-forecasting tool.

Furthermore, and in order to provide more effective results, a technological surveillance should be set and more data from future production records should be incorporated in followup of the productive process.

In trying to understand the role of learning mechanisms in the life-cycle of several technologies, Necton has installed and run four types of different technologies. The technical staff of the company was asked whether they have experienced or not the different learning mechanisms (learning-by-doing, learning-by-searching, learning-by-using, learning-by-interacting) during each life-cycle and the conclusion was that learning mechanisms played different roles in each life-cycle:

A general trend that can be identified is that learning-by-doing is more relevant in the phase ‘growth’ and learning-by-using role has more weight in the ‘maturity’ and ‘decline’ phases

of technology. These findings are in accordance with literature. First, the learning-by-doing mechanism originates as a by-product of economic activity in general, Kamp *et al.* (2004) claim that this learning mechanism always exists and that producing is sufficient to trigger it. Second, learning-by-using can only be assessed after intensive or prolonged use of the technology, while tasks related with technological optimisation take place (Rosenberg, 1982).

As learning-by-searching is related to the systematic and organised search for new knowledge, the role of this mechanism became particularly relevant in the 'growth' phase of the raceways and GW technologies, due to the fact that both technologies were the state-of-art when installed. During the interviews, another fact that was mentioned about this type of learning is that whenever new solutions to improve technology performance were based on R&D activities, playing a decisive role.

The mechanism of learning-by-interacting was fundamental in the case of GW, as Necton closely collaborated with the technology developer. The information required to dominate the technology was tacit and learning occurred during direct face-to-face contacts. Moreover, during the interviews it was also mentioned that the communication between microalgae producers has always been scarce, as there were only few players in the market. Therefore, the role of learning-by-interacting was less noticeable.

It was also possible to conclude that learning-by-doing may not be the only factor underlying the learning process with the firm, and technology development is a reflection of all effects, including the effects of other learning mechanisms, such as learning-by-searching, learning-by-using and learning-by-interacting. In general terms, the role of learning-by-doing is more relevant in initial phases of technology life-cycle, learning-by-using appears in the maturity and decline phases, as it requires a longer utilisation of technology. Learning-by-searching was found to be only relevant when learning-by-doing does not have an immediate and positive effect in the technology performance, in an attempt to find technical and scientific solutions. Learning-by-interacting was quite important in the GW operation, especially with the technology developer. It was also mentioned, during interviews that as there are few microalgae producers in the market; learning from interacting with other market players is residual. These findings should be confirmed using other commercial plants as additional case-studies. In the future a KM tool could be developed with this sort of information that could help managers to orientate learning processes towards the acceleration of the rate of learning.

References

- Alavi, M. and Leidner, D., 2001. Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. *MIS Quarterly*, 25(1), pp. 107 – 136.
- Anderson, P. and Tushman, M.L., 1990. Technological discontinuities and dominant designs: A cyclical model of technological change. *Administrative Science Quarterly*, 35, pp 604-633.
- Argyris, C.; Schon, D. A., 1978. *Organizational Learning: A Theory of Action Perspective*. Addison-Wesley, Reading, MA.
- Arrow, K., 1962. The economic implications of Learning by Doing, *Review of Economic Studies*, vol. 29, pp 155-173.
- BCG, 1968. Perspectives on Experience. The Boston Consulting Group, Boston. [Available in www.bcg.com and accessed in 14.02.2009, 17h.37m]
- BCG, 1972. Perspectives on Experience. The Boston Consulting Group, Boston. [Available in www.bcg.com and accessed in 14.02.2009, 17h.37m]
- BCG, 1974. The experience curves reviewed. The Boston Consulting Group. Boston [Available in www.bcg.com and accessed in 14.02.2009, 17h.37m]
- Boulding, K., 1985. *The World as a Total System*. London: Sage.
- Correia, A. and Sarmento, A., 2004. The European challenge of KM and innovation: a skills and competence portfolio for the knowledge worker in SME's. In Montano, D. (ed.), *Innovations of Knowledge Management*. Hershey: Idea Group Publishing, p. 252-284.
- Duke, R.D. and Kammen, D. M., 1999. The economics of energy market transformation initiatives, *The Energy Journal*, 20(4), pp 15–64.
- Duncan, R. B., Weiss., A., 1979. Organizational learning: Implications for organizational design. *Res. Organ. Behavior*, 1(4), pp 75–125.
- Dutton, J. and Thomas, A., 1984. Treating progress functions as a managerial opportunity. *Academy of Management Review*, 9, 2, pp 235 – 247.
- Foray, D. and Lundvall, B. 1998. The Knowledge-based economy: from the economics of knowledge to the learning economy. In Neef, D., Siesfeld, G. and Cefola, J. (eds), *The Economic Impact of Knowledge* [Available in <http://books.google.com> and accessed in 07.02.2009, 22h.12m].
- Foray, D., 2006. *The economics of knowledge*. The MIT Press.
- Frascati Manual, 2002. *The Measurement of Scientific and Technological Activities, Proposed Standard Practice for Surveys on Research and Experimental Development*, OECD Publishing.
- Hackett, B., 2000. *Beyond Knowledge Management: New Ways to Work and Learn*. The Conference Board. [Available in <http://books.google.com> and accessed in 07.03.2010, 16h.25m].
- Henderson, R.M. and Clark, K.B., 1990. Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Administrative Science Quarterly*, 35, pp 9-30.
- Hirsch, W., 1952. Manufacturing Progress Functions, *Review of Economics and Statistics*, 34, pp 143 – 155.
- IEA, 2000, *Experience Curves for Energy Technology Policy*, IEA Paris, France.
- Jakob, M. and Madlener, R., 2004. Riding down the experience curve for energy-efficient building envelopes: the Swiss case for 1970–2020, *Int. J. Energy Technology and Policy*, Vol. 2, Nos. 1/2, pp 153 – 178.
- Johnson, B., 1992. Institutional Learning. In Lundvall, B.A. (ed.), *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning*, London: Pinter, pp 23–44.

Junginger, M., Faaij, A., Turkenburg, W., 2004. Global experience curves for wind farms. *Energy Policy*, 33, 2, pp133–50.

Junginger, M.; Faaij, A.; Björheden, Turkenburg, W. C.; 2005. Technological learning and cost reductions in wood fuel supply chains in Sweden. *Biomass and Bioenergy*, 29, pp 399 – 418.

Kamp, L; Smits, R.; Andriess, C.; 2004. Notions on learning applied to wind turbine development in the Netherlands and Denmark. *Energy Policy*, 32, pp 1625–1637.

Lave, J. and Wenger, E., 1991, *Situated Learning: Legitimate peripheral participation*, Cambridge University Press, New York.

McDonald, A., Schrattenholzer, L., 2001. Learning rates for energy technologies, *Energy Policy*, 29 (4), pp 255–261.

Neij, L.; Andersen, P.; Dannemand Andersen; Durstewitz, M.; Helby, P.; Hoppe-Kilpper, M.; Morthorst P., 2003, *Experience Curves: A Tool for Energy Policy Assessment*, 40, KFS AB, Lund, Sweden.

Papineau, M., 2006. An economic perspective on experience curves and dynamic economies in renewable energy technologies, *Energy Policy*, 34, pp 422–432.

Pisano, G.; Bohmer, R.; Edmondson, A., 2001. Organizational Differences in Rates of Learning: Evidence from the Adoption of Minimally Invasive Cardiac Surgery, *Management Science*, Vol. 47, No. 6, pp. 752–768.

Prahalad, C.K. and Ramaswamy, V., 2004, Co-Creating unique value with customers, *Strategy and Leadership*, 32 (3), pp 4-9.

Rosenberg, N., 1982. *Inside the Black Box: Technology and Economics*. New York: Cambridge University Press [Available in <http://books.google.com> and accessed in 08.02.2009, 20h.57m].

Rothschild, M., 2004. *Bionomics: Economy as Business Ecosystem*. Beard Books.

Rotmans, J. and Kemp, R., 2003. *Managing Societal Transitions: Dilemma's and Uncertainties: The Dutch Energy Case Study*, paper presented at the OECD Workshop. [Available in <http://www.oecd.org/dataoecd/6/31/2483769.pdf> and accessed in 07.02.2009, 22h.28m].

Schaeffer, G. J., Alsema, E., Seebregts, A., Beurskens, L., de Moor, H., van Sark, W., Durstewitz, M., Perrin, M., Boulanger, P., Laukamp, H., Zuccaro, C., 2004. Learning from the Sun - Analysis of the use of experience curves for energy policy purposes: The case of photovoltaic power. Final Report of the Photex Project ECN-C-04-035 [Available in www.ecn.nl/docs/library/report/2004/c04035.pdf and accessed in 07.02.2009, 20h.36m].

Schumpeter, J., 1947. The Creative Responses in Economic History, *The Journal of Economic History*, Vol.7, No.2, pp.149-159.

Senge, P. M., 1990. *The Fifth Discipline: The Art and Practice of the Learning Organization*, 2006 Edition Revised and Updated, Random House Business Books.

Utterback, J.M., 1994. *Mastering the Dynamics of Innovation*. Boston, Harvard Business School Press.

Van den Wall Bake, J.; Junginger, M.; Faaij, A.; Poot, T. and Walter, A., 2009. Explaining the experience curve: Cost reductions of Brazilian ethanol from sugarcane, *Biomass and Bioenergy*, Volume 33, Issue 4, April 2009, pp 644-658.

Van Sark, W.G.J.H.M., 2008, Introducing errors in progress ratios determined from experience curves, *Technological Forecasting and Social Change*, Volume 75, Issue 3, pp 405-415.

Vaz, T. N. and Nijkamp, P. 2009. Knowledge and innovation: The strings between global and local dimensions of sustainable growth. *Entrepreneurship & Regional Development*, vol. 21, n° 4, pp 441-45.

Von Hippel, E. and Katz, 2002, Shifting Innovations to Users via Toolkits, *Management Science*, Vol 48, (July), pp 821-833.

Von Krogh, G., Nonaka, I. and Aben, M., 2001. Making the most of your company's knowledge: a strategic framework, *Long Range Planning*, Vol. 34, No. 4, pp 421-39.

Weiss, M., Junginger, Patel M. and Blok, K., 2010. A review of experience curve analyses for energy demand technologies, *Technological Forecasting and Social Change*, Volume 77, Issue 3, pp 411-428.

Wene, C., 2000. *Experience curves for technology policy*. Technical Report, International Energy Agency.

Xie, C.; Bagozzi R. and Troye, S.; 2008, Trying to prosume: toward a theory of consumers as co-creators of value, *J. of the Acad. Mark. Sci.*, 36, pp 109-122.

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