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STP reshaping the Territories Of the Future by means of SmartLands: Urban-Rural Cohesion

WORKSHOP 4 - Unusual experiences in clustering science and technology initiatives

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STP reshaping the Territories Of the Future by means of SmartLands: Urban-Rural Cohesion

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Executive Summary

The election of a location for a Science and Technology Park (STP) has been, traditionally, crucial in order to consider the impact of its activity based on the level and accessibility of the resources required. However, it is more important its sphere of influence, not located geographically by territorially, and that sphere is evolving based on the evolution of the innovation ecosystem.

The role of STP over a territory, a "Smart-Territory" has to be seen it as acting as the main driver to dynamize the economy of that space, therefore it implies to extend its roots to all the corners of the spatial area. The question is not which is the relationship between the STP and the city, but between STP and its territory conceived as urban and rural spatial area, that is to say as **smartcities** and **smartrural** generators and, in terms of knowledge economy, the fostering of the **smart citizens conception**: the engine of a **growing SmartLand**, a supra-entity among the innovation ecosystem.

Territory as Ethic Space of Cooperation

A "Territory", so far, has been as a portion of geographical space that coincides with the spacial extended of a goverment's jurisdiction (Gottmann, 1975)[1].

However, when a Territory extend their conceptualization to a deeper level of abstraction due to a multidimensional nature, englobing a cuadruple helix formed by economical, social and ecological perspectives plus the citizens as active agent and all the correspondent actors involved in the inter-cooperation process, then it is becoming in a new space of interaction. We could name it as "Intelligent Territory", "Smart-Territory" or "SmartLand".

Under that premise, a "Smart Territory" can be defined as an Ethical Space that engage tangible and intangible assets on an inter-territorial aggregation either supramunicipality or supra-region, in order to enable the development of the productive economy, social cohesion and environmental balance in their relationship with the environment, leading to an ecosystem that prioritize resource knowledge as a catalyst for inter-cooperation.

An ethical space is configured from the people, their individual values converging with those of the various groups in which are integrated: in the value chain of market offering, in the complex reality of territorial scenarios and the internationalization

1 The evolution of the concept of territory , Jean Gottmann, Social Science Information August 1975 vol. 14 no. 3 29-47

process of their identity.

A fractal reality implemented by an accumulation of actions aimed to compose a space in which sustainability, connectivity, innovation and equity are structural axes.

Role of a Science and Technology Park

Traditionally, the sphere of influence of STP has been enclosed in a geographical and limited location, and therefore with a very delimited impact area, trying to avoid any conflict with other STP closer (in some countries the level of concentration of STP per square meter is considerable, above all in the big metropolitan areas). Although this pose is reasonable during the first stages of the STP creation process, it should not be the regular philosophy for the rest of the stages that will require a level of permeability. Indeed, we should reconsider the definition of the Science and Technology Park extending their influence based on another vision, more cooperative than competitive, more collaborative than exclusivist, in an essential concept as a **coopetitive agent** at the Global Innovation Ecosystem less bound with the physical area.

Science and Technology Parks should be considered as a set of kaleidoscopic variety of tools for local and regional economic development supporting the innovation process and subsequent increase of competitiveness of firms and regions (Vladimír Székely, 2012)[2] and therefore, they encourage national and regional development, engage the SMEs to foster R&D and innovation, job creation and business profitability creating a "sunrise future" for the territory.

This new conception inspires a new approach for STP when it is re-ubicated to an upper layer of influence. This approach gives a new perspective, a systemic one[3] by which the interactions among the parts (in this case the SMEs) determine el whole (i.e. Science and Technology Park) and at the same time the behaviour of the parts. The essential feature of this new thinking is the capability of detecting reciprocal relations among the SMEs and assessing its importance, most of the cases greater than the elements related[4] that indeed, and sometimes unconsciously, most of the parks are actually performing it in one way or other.

How the STP imbricates in the conception of a "Smart-Territory"

The conception of "Smart-Territory" comes up under the necessity of identifying a new **identity paradigm** providing a new approach to the interaction among all the innovation agents under the Global Innovation Ecosystems as is visualized by our park in Spain, espaitec Science & Technology Park, with a strong integration on the territory. The creation of "Smart-Territory" follows the Convoy Model[5] approach to enhance the

2 "AN INTRAURBAN LOCATION CHOICE FOR A SCIENCE AND TECHNOLOGY PARK IN BRATISLAVA: A FEASIBILITY STUDY", Vladimír Székely, Institute of Geography, Slovak Academy of Sciences, Štefánikova 49, 814 73 Bratislava

3 General Theory of Systems, Ludwig von Bertanlanffy, 1968

4 No limits to learning, James W. Bokin, 1979.

5 "The Convoy Model as a new "glocal" growth accelerator metaphor for the economy in the next decade", IASP 28th World Conference Copenhagen 2011, Juan A. Bertolin et al.

"coopetitiveness[6]" of the territory.

The Convoy Model7 8 is a new approach to the region innovation generation which aims to be built over three main cornerstones:

- It is multidisciplinary and multi-synergic, as it allows the involvement of different agents (companies, institutions, governments, customers, providers and citizens) by means of "interactions" (out-in), "outreactions" (in-out) and coopetition relationships (cooperating + competing).
- It stimulates and reinforce the Open and Cross Innovation actions.
- It is a MIMO (Multi-input Multi-ouput) entity.

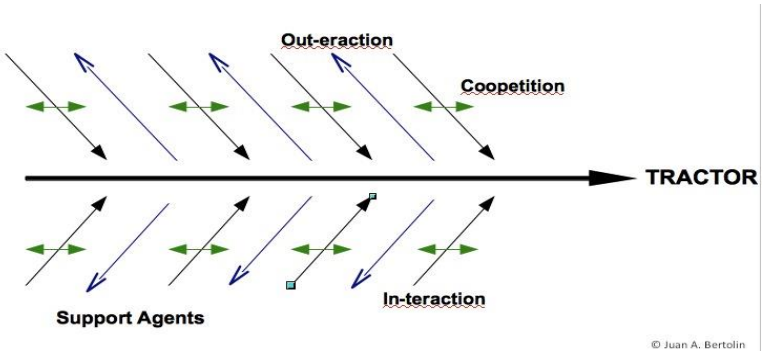

Fig.2 Fish-bone of tractor projects (proprietary development)

The **Convoy Model** acts as a magnet attracting collaboration and initiatives that enable continuous improvement, continuous value creation, and synergies.

The **Convoy Model** can be used to regenerate traditional sectors and traditional management techniques, which have been unable to adapt to the future.

The aforementioned interaction is conceptualized as a multidimensional matrix with all the nodes interconnected and in continuous movement where STP plays a crucial role.

By this attitude, the nodes act to enhance the competitiveness of a territory using the leverage of innovation created by interaction, therefore a **STP can be considerer as a metaorganiser of resources and capabilities** in order to develop coopetitive and innovative potentialities of its territory (Mastroberardino & Nigro, 2006)[9]

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6 Adam Brandenburger, Barry Nalebuff 1996 Co-Opetition : A Revolution Mindset That Combines Competition and Cooperation

7 "The Inspection Problem", G.O. Mensch, Working Paper No. 241, CRMS Center for Research in Management Science, University of California, Berkeley, January 1968,

8 "On Integral Complementarity", G.O. Mensch,Working Paper No. 245, CRMS Center for Research in Management Science, Berkeley, February 1968; both papers solve the governance and coordination problems of "moving in sync" and provide the mathematical proof (Kuhn-Tucker conditions) of Existence Theorem of "movements in convoy").

9 "A Systemic Approach To The Study Of Science And Technology Parks And Their Relations With Regional Economic Growth" Prof. Piero Mastroberardino Prof. Claudio Nigro Dott.ssa Gemma Carolillo, 2006

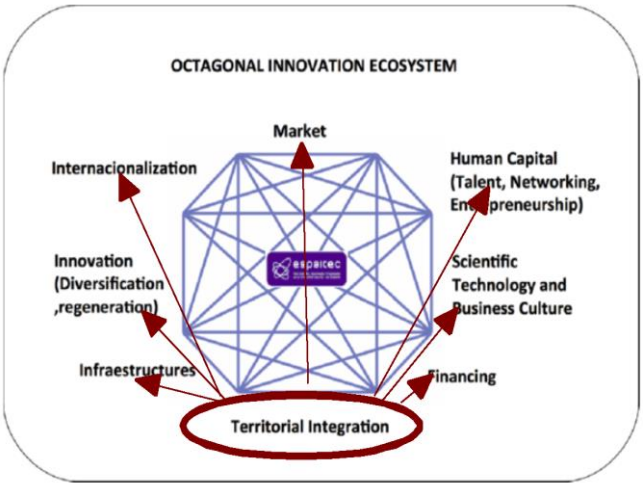


Fig.3 Octagonal Innovation Ecosystem defined by espaitec

From the "**territory**" conception, it is required to view it from its global perspective not as a spatial area governed by a local institution but as supra-municipality entity that connect the government body and its community. In that point of time, it does make sense to talk about "**territorial system**" (Fernandes et al., 2005)[10] and about territorial actors (namely STPs and their stakeholders).

The territory entity is part of the Regional Innovation System, that is indeed understood as existing in regions that possess a great diversity of innovative organisations located in an institutional environment where systematic connections and interactive communication are rather often among local actors. These organisations are universities, fundamental or application-oriented research laboratories, technological transfer agencies, brokers, regional governance organisations, bank and the venture capital system and companies (Fernandes et al., 2005).

Due to its nature STP are changing its initial concept to become creative '**learning villages**' (what we could also call, Living Labs[11]), that is to say a non-delimited geographical space that integrates not only business activities, educational and R&D centres and services but also residential, cultural, recreational and leisure areas with the involvement of the citizen in all the processes as co-creators and co-designers of their own surrounded context.

So far, if STP has been used to be a "language" translator between University, as a Knowledge Center, and the network of businesses, it is now the time to become the main fibre to connect urban and rural intelligent areas. Therefore, it should become the main amalgamation of all the innovation agents, not one more but the driver, the orchestrator of all the resources (human and financial) and the networking linker.

10 "Territories and Innovation Systems: Cooperation Strategies Between Universities and Companies in Taguspark", Fernandes, Manish and Duarte, Rui,41st ISoCaRP Congress 2005

11 "e'LivingLab: The Science & Technology Parks and Living Labs binomial as innoconnectors for SmartRegions creation", IASP 29th World Conference Copenhagen 2012, Juan A. Bertolin et al.

Urban-rural cohesion: Rural Labs to foster innovation on the "Smart-Territories"

More than 90% of EU territory is categorized as rural, so it constitutes an interesting environment for the creation of new businesses initiatives, basically supporting ICT innovative services and products, with public-private partnerships in order to ease the socio-economic development of the region[12].

Rural Labs are an extension of the Living Lab concept, with aim to involve and experiment new innovative approaches with real users in real-life environments, that will be able to remove rural development barriers by the integration of collaborative programs among all the agents of the "**rural innovation ecosystem**" and a catalyst of an Urban-Rural cohesion.

Rural Lab is the best scenario for engaging rural local communities to develop social innovation, it could considered as well as Social Spaces for Research and Innovation (SSRI)[13]. However, when these local communities included in the municipalities and public entities do not sufficiently exchange information, that is to say there is a lack of efficient networking. When the concept of Rural Lab is taken, it is not referred to a specific municipality but a holistic system that conforms the territory as a whole so, such lack of current interaction provokes an inefficient common strategy to exploit synergies among all the entities and the appropriate societal sustainable impact.

The figure of "Smart-Territory" does not focus only in the rural development but to consider its connection with the urban side as a continuum bidirectional streamflow, a urban-rural cohesion that will capture the enormous diversity and dynamic nature of the development of those spaces. A technology and knowledge transfer of innovations from urban to rural, and viceversa, could improve economic development prospects of rural areas. and in the other way around. Nevertheless, the configuration of a "Smart-Territory" supported by a figure, such as a Rural Lab, accomplishes the "Contingency Theory"[14] by which human combinations from the organizations, financial and technical could be effective in some contexts and not in others. So it is important to analyze the boundary conditions to reduce its uncertainty.

Espaitec reinforces its mission by providing an ideal environment in the province of Castellón called the e'LivingLab[15], a "**Symbiotic Crowd-sourcing**" instrument that will strengthen, whenever possible, the cooperative development of innovation across all socio-economic agents in Castellón what we call the democratization of the innovation. This e'LivingLab focused into the rural area of the province is the Rural-Lab aforementioned.

In addition to this, Espaitec is leading the implementation of a Capability and Technology Map of the territory of Castellon de la Plana[16] that will embrace the

12 "Innovation Strategy for Rural Development Based on LivingLans for Humn Empowerment", Mariano Navarro et al., 2010

13 See http://www.researchspaces.eu

14 Woodward, J., (1958): Management and Technology. London: Her Majesty's Stationary Office

15 "e'LivingLab: The Science & Technology Parks and Living Labs binomial as innoconnectors for SmartRegions creation", IASP 29th World Conference Copenhagen 2012, Juan A. Bertolin et al.

16 The province of Castellon de la Plan has got 135 municipalities, only 8 with more than 20,000 inhabitants. 100 municipalities represent only 80,000 inhabitants. It is the 2nd most mountainous province. The coastline mainly irrigation land, rich and populous. The interior is dry, mostly

hybridisation process among all the innovation agents of the territory, from the coast to the interior of the province, from the cities (our smart-cities) to the rural smart-villages reducing the gap between both environments (rural and urban) and facilitating their complementation.

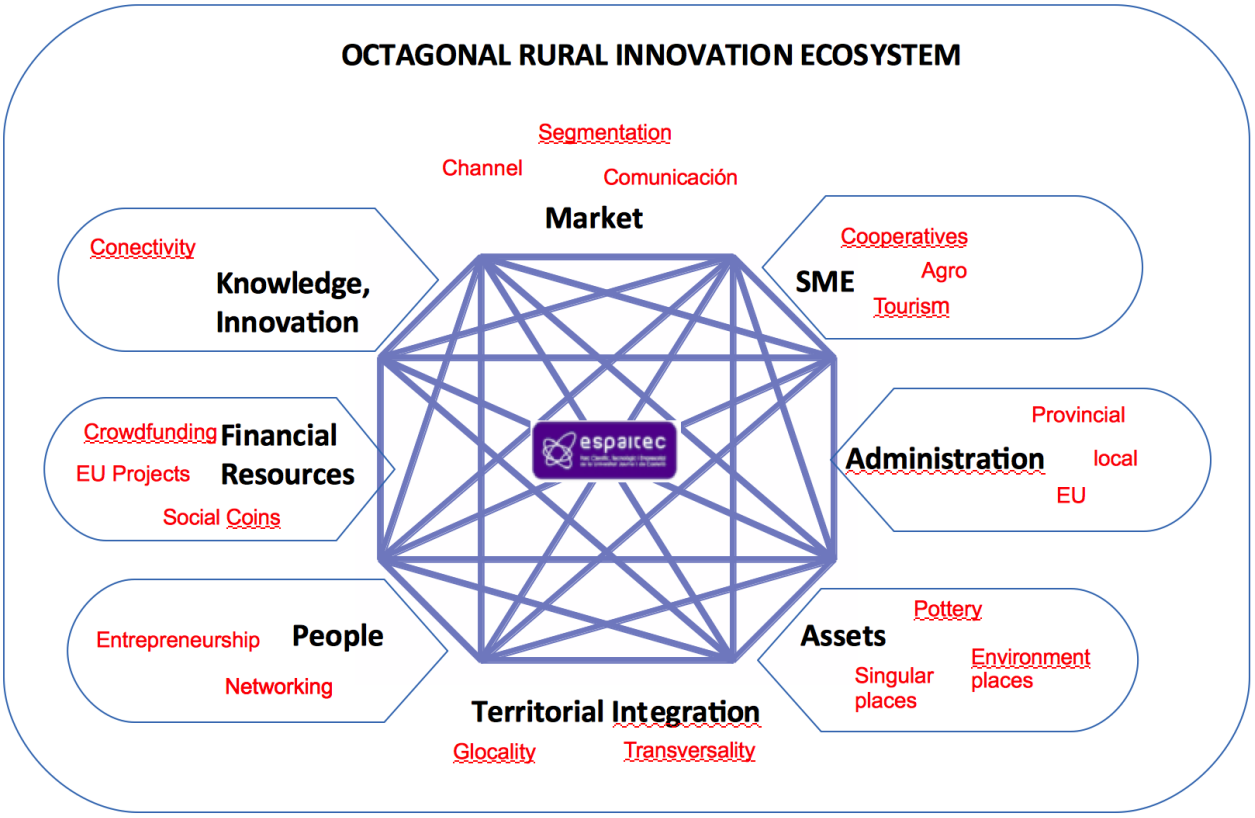


Fig.4 Adaptation of Octagonal Innovation Ecosystem to Rural one

uninhabited, and with difficulties in transportation and communications.

Key Indicators: Performance, sustainability,...

The capability of measuring the interaction among innovation agents at the Smart-Territory, the impact of the actions taken, observed,.... provides a set of very useful data in order to assess the impact of those action at the environment.

Although, it is required a deeper analysis of each territory and based on the nature of the agents a minimum set of some indicators have been considered designed and validated with the citizenship participation:

ENVIRONMENTAL INDICATORS

1. Maintenance of forest
2. Time without fire
3. Forest Roads
4. Number of activities
5. Energy production

SOCIAL INDICATORS

1. Territorial cohesion (degree of interaction)
2. Number of persons / entities active (that energize)
3. Pride of ownership
4. Average age of population
5. No. stories
6. Number of visits
7. Integration native residents / potential
8. No. applied external initiatives
9. Own initiatives No. applied

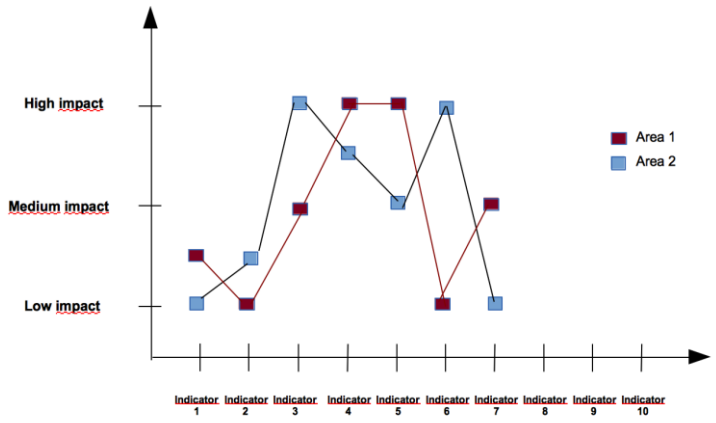
ECONOMIC INDICATORS

1. Number of companies / number of inhabitants

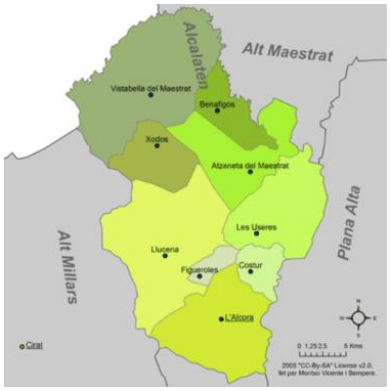
2. Impacts on media (ON LINE)
3. Access WIFI / Internet
4. Ability to provide value products
5. Number of new businesses
6. investment
7. Unemployment / employment

All of the aforementioned indicators, are the first step to frame the elements to track in order to ensure that the actions taken will be effective.

One of the tools that will help to evaluate the position of each part of the territory, and compare it with the rest, is the **strategic profile**. Based on the main indicators identified and their impact, a graph as it is shown in the following picture will be used:



Case study of Alcalaten as Smart Territory



The project L'ALCALATEN, led by espaitec Science and Technology Park in collaboration with Concierta[17] and with the support of Provincial Council, aims to identify the relevance of the territory concept in the region of L'Alcalaten , located into Castellon Province.

The scope of the strategy will pay attention also to the supply profile in different segments of the productive economy of the region. The progressive integration of the Territory factor in the intangible assets of the individual and collective offering will confirm their status as a distinct identity catalyst of that offer.

The Territory as an intangible asset

It is clear that the current economic situation has caused a change in the profile of different consumer segments. And, as a result, companies are modifying and adapting the intangible assets of their offer.

The territory can be considered as an intangible asset if it optimizes the quality of their relationship with the companies, in a conceptional ecosystem, that would lead to the display of the region as Smart Territory.

The objectives of the project are:

- Identify a number of institutions and companies from different segments of the productive economy of the territory that can shape the study group. In practice, people who are interested and committed in participating in a process of generating knowledge that can be helpful, no matter what is their position in the institutions or companies.
- identify the different formats that recognize consumption in relation to the market.
- Identify projects that actors are taking place, to see the possibility of inter-cooperation among them, thus improving their efficiency and effectiveness.

17 http://concierta.org

- Identify different intangible assets of its bid.
- Identify the relationship of companies with their local environment and the extent of its reach as a strategic
- Establish a work plan to optimize the ratio of each company and the group with the domestic ecosystem, strengthening of eco-efficient atmosphere.

The project is being deployed in different **micro-processes**, within a maximum of twelve months.

Identity and paradigm

The territory is identified as relational ecosystem where the inter-cooperation of agents in the value chain of local and global market is essential to deploy an effective strategy. Identity and Paradigm are the elements to make it happen.

Identity

Being aware of the diverse identity profiles of l'Alcalaten the starting point requires to identify their weaknesses and strengths, interpreted not only in terms of its economy, also those others who may be elected as definers of social reality and environmental relations and the management of environmental values.

It happens with the concept of GDP. Given the current economic downturn, restoring economic growth is a major concern, and GDP is a key indicator to evaluate the effectiveness of the recovery plans of the territory.

The GDP has also come to be regarded as a proxy indicator for overall societal development and progress in general. However, by design and purpose, it can not be relied upon to inform sustainable growth of the territory. In particular, GDP does not measure environmental sustainability or social inclusion. A Eurobarometer survey conducted in 2008 showed that more than two thirds of EU citizens think that social indicators, environmental and economic alike should be used to assess progress. So the conception of the identity of L'Alcalaten will be fixed with indicators promoted from the public debate based on a set of indicators that include elements from the OECD Better Quality Index, Human Development Indicators[18] and Happy Planet[19] Indicators.

Thus, a first task will be choosing the indicators that can help us establish more timely understanding of the identity of our territory.

Paradigma

The current situation calls for a review and update of the value system that allows us to face the new challenges that the relationship between supply and demand arise. The value system will specify the new parameters of the area's identity.

Inter-cooperation is seen as paradigm, beyond other options as excellence. And from this

18 http://hdr.undp.org/en/statistics/

19 http://www.happyplanetindex.org/

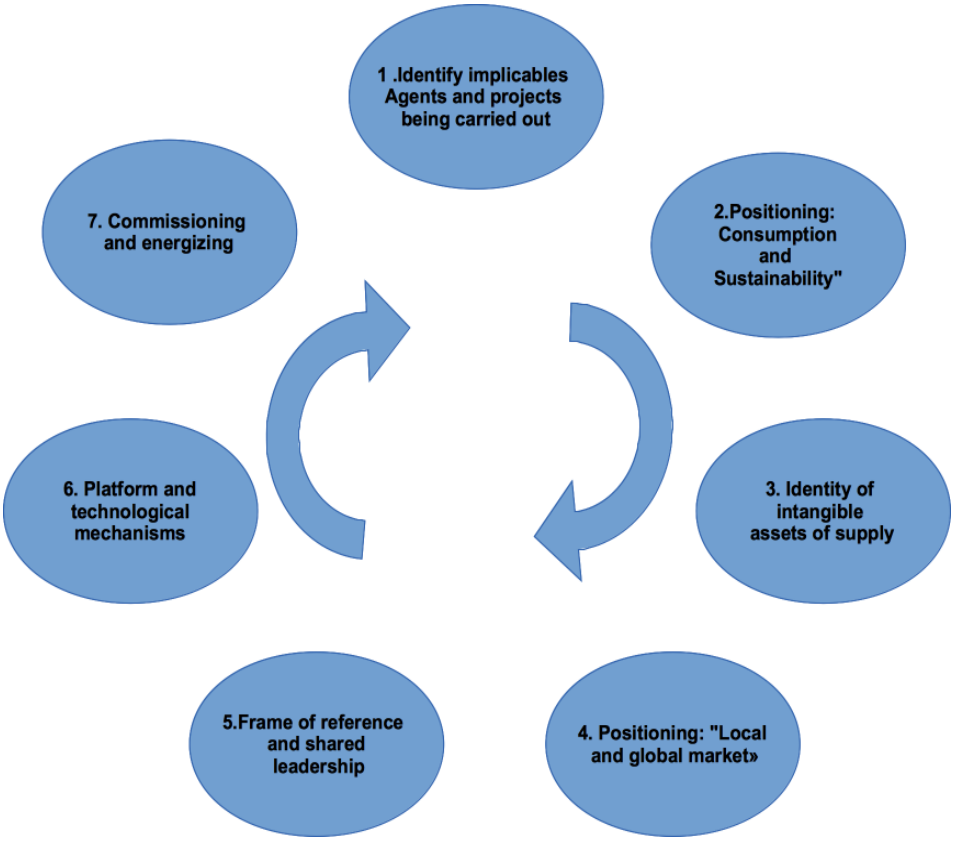
consideration the value system will give priority to collective knowledge generation, innovation that considers cooperation between the agents of the value chain, the social collective involvement in setting priorities, etc..

The project will specifying the value system and its management, while guarantees of territorial identity and its construction as a collective endeavor intelligent.

Microprocesses

The project is conceived as a macro-micro processes that concrete objectives and short-term trajectory. Each section will allow not only the identification and management of strategic factors that will enable the achievement of the objectives of the project but to incorporate new tasks based on the data and criteria that each process can contribute.

Microprocess relationship is as follows:



1. Identify implicables agents

The first scenario that the project will face will be to identify the agents, people, companies, institutions will be invited to participate in a first task of reflecting on the different ingredients that make up the identity of L'Alcalaten: value system, indicators

of economic growth, social and environmental and inter-cooperation mechanisms between the agents involved in collective supply.

The election shall be considered as natural selection, through calls to meetings of different groups, and interviews with individual agents whose profile it necessary in which it will been identified projects that actors are taking place, to see the possibility of inter-cooperation among them, thus improving their efficiency and effectiveness.

To develop an efficient and effective communication channel among all the agents, it is required to design and create online communication mechanisms the will allow agents to exchange their views, suggestions and information that will generate the project. The set of ICT tools used are being:

Internal:

Dropbox (as a document repository)
Skype for audioconferences (mainly due to transportation networks deficiencies)
Yammer (as internal twitter tool to exchange points of view)

External:

Linkedin Group to provide open discussions
Facebook Fan Page, Twitter and Blog to communicate the main achievements obtained as front-end of the project to the world.

The process will conclude with a forum on the Identity and L'Alcalatén Paradigm, which will be as the assembly process management settings like Intelligent Territory region.

2. Positioning: "Consumption and Sustainability"

The second scenario that the project will face will be to reflect on the different formats of consumption that occur in the territory of L'Alcalatén, not only in the local trade but in all those business and institutional initiatives that affect the economy ecosystem.

The actions are specified in survey tasks that allow us to define the profile of demand in its various forms and formats, through the implementation of actions that exchange business, with consumers and creative planning, and report editing first proposals and acting in cooperation with those entities willing to revise your offer intangibles.

These actions will be specified in three meetings with the various groups described and the convening of a Forum set to be approved in a first working script which will affect the compatibility of actions to promote an offer adapted to the new consumer formats and sustainability indicators.

3. Identity of intangible assets of supply

The microprocessing seek to identify what is the degree of relevance and market reach of those intangible assets that support companies and organizations recognize their offer. The performance will take the character of meetings with companies and entities involved in the project.

In short we are talking about factors that often are not managed in the configuration of supply as with tangible assets.

An asset is a resource controlled by the entity that could and can get tangible benefits. The intangible term used with a restricted sense for assets that produce benefits similar to those produced by the assets or income and can not materialize physically.

Intangible assets include: branding, corporate identity, corporate communication, image, stakeholder recognition and reputation of an organization, business knowledge, operational, scientific or technological, intellectual property, patents and rights marketing, licenses, concessions and copyright, the customer base and how to relate to them, among others.

The project aims to identify the real extent of intangible assets in the market, and add to the portfolio of intangible assets of individual and collective supply territory factor.

Timely management of inter-process that enhances the relevance of individual and collective intangible assets, including land, will enable better continuous positioning of companies and entities in the market, and optimization of social and environmental balance in the ecosystem.

4. Positioning: "Domestic market and global market»

In this fourth microprocessing we propose convening a Forum to review the profile of the relationship between individual and collective deal with local and global markets, threats and opportunities in both contexts, identified uniquely in order to stimulate and modulate the activity entrepreneurship.

The emphasis of the discussion will be on identifying profiles and systemic disruptive innovation that are or can be deployed in the region. We will choose the most appropriate mechanisms for entrepreneurial activity can be raised and promoted.

The choice of projects that can be analyzed in the forum will involve the signing of a contract between the parties involved, which enables optimization of protection in order to consolidate the business.

5. Frame of reference and shared leadership

This crosscutting microprocessing allow you to configure a framework with strategic and operational criteria that encourage intelligent territory quality in the region of L'Alcalaten.

Criteria to materialize the following indicators:

a. The territory is sustainable;
b. The territory is connected;
c. The territory is innovative;
d. The territory is fair

The factors to achieve this dimension are:

a. Setting new standards of quality
b. Consolidation of a mode of operation based on active intercooperation
c. Enhancing the knowledge economy
d. Integration of advanced technology

By influencing the demand that the territory, through their organizations, respect the complexity, without rank or centrally organized, intelligently articulate interests, learn to cooperate, manage clutter and knowledge govern well, we are endorsing the need for a shared leadership, explicitly recognized in each of the areas of operation.

6. Platform and technological mechanisms

The project was created with the purpose of hold on the deployment of a technology platform that optimizes the management of information and knowledge.

This micro process will also cross character shaping their goals and go depending on the needs that arise in each of the micro mentioned.

It seems clear that the project will require innovative materialization of a technological approach can interpret the randomness of a reality that evolves continuously at both the tangible and face as in the intangible and virtual. And, ultimately, optimize the use of technological devices used in an advanced society without avoiding the challenges that arise from the complexity management:
The growth and development of a postindustrial society, or technological advanced, is the result of a complex set of social factors and not just the accumulation of capital. Innovation, creativity, and sustainable growth depend much more directly than before the level of knowledge: information management, education, scientific research and technical training, the ability to schedule and regulate the change in the social relations, forms of management and organization, etc..

6. Commissioning and energizing

A macroprocess have to develop cognitive strategies to act in uncertainty. Among the most important knowledge is the risk assessment, management and communication. We must learn to move in an environment that is no longer clear relationship between cause and effect, but blurry and chaotic, systemic.

At this point, the behaviour of the agents will be linked to real interests, with targets capable of regenerating the system incorporating new assets continuously. In short, the model of Smart Territory will be able to increase confidence in an identity defined by active intercooperation.

Conclusions

There is an important change in the paradigm of the territory, less linked to a physical area and more to an ethic space, understood as an entity that breaks the borders of municipalities, provinces and regions artificially created by governments, in which Science and Technology Parks (STPs) act on the one hand as a dynamic engine and inno-connector with the global innovation ecosystem and on the other, as technology and innovation provider.

This interaction promotes another perspective of a STP as catalyst of the coopetition process among all the agents involved in the polyhedron space that conforms the Smart-Territory, in which conception all the actions spin around the citizenship, giving again the leading role of the global ecosystem to the citizen.

The global markets foster, in some way, to manage efficiently the resources and capabilities that will increase the life quality and the equilibrium among all the ecosystem agents.

The analysis of the Smart-Territory concept reinforces the importance of the urban-rural cohesion for the socio-economic development of a region or territory, provoking a change of governments mindset as urban areas have been so far the areas where the institutions have mostly paid attention to.

Nevertheless, the shape of a Smart-territory is amorphous and evolutes based on the capabilities, resources, strategies and vision shared by all the elements committed in the implementation of this singular space. This nature suggests the conceptualization of this new approach of the territory by means of fractal analysis and territorial prospective that will conform a new zoning perspective and a new governance strategy.