



## **OPAALS PROJECT**

Contract n° IST-034824

# **WP 12: Socio-Economic Models for Digital Ecosystems**

## **Del12.8 – Creation of a Living Laboratory for the service experimentations in DCEs**



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**Short Description:**

The main objective of this deliverable is to put in practice what we learned in the first phase of the project by exposing the development of a distributed living laboratory for CNs and DEs interconnection (DCEs) in Trentino. The laboratory should offer an open innovation space where Public Administrations, local industries (in particular small and medium business) and research institutions will share knowledge and tools in order to develop DE components to be used for local innovation. In this deliverable is therefore described the innovation strategy and activities that attempt to connect three levels of local innovation: the top-down public broadband infrastructures, the middle level composed by projects that are changing the regional innovation system with new rules, institutions, relationships and technologies, and a series of bottom-up projects that should provide infrastructures and services to specific communities. Following the socio-technical approach used in the first phase of our research, we will monitor the development of the test in the Province of Trento from the point of view of the socio-technical infrastructure and the innovation processes.

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**Partners contributed:**

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<b>Work Packages</b>	The WP12 (D12.9) and WP11 (T11.8, T11.9, T11.10) will take advantage from this deliverable.
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<b>PhD Students</b>	
<b>Outstanding Features</b>	In this deliverable we explain how we take into practice the strategy to develop a DCE by working contemporary on (a) local participation, infrastructures and services, and (b) top-down and bottom-up initiatives. In this intermediary report we highlight both the positive and the critical issues that emerge from fieldwork in order to present a clear and rich image of this innovation process in Trentino.
<b>Disciplinary domain of authors</b>	Francesco Botto: social science and information systems research domains.



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# 1. Introduction

This deliverable continues the work done by CREATE-NET in the first phase of the project, it explains the early work of the second phase, and it introduces the third phase activities in the WP11. In the first phase of the project we reflected on the relationship between Community Networks and Digital Ecosystems, by also developing a socio-technical conceptual framework (D7.1), and we introduced the planning phase of the Trentino case (D7.2). In the second phase we started by developing a the concept of Digital Community Ecosystem (DCE) for regional innovation and we suggested an alternative strategy for DE introduction and facilitation in the regions.

With this report we expose in detail how the DCE innovation strategy is being sustained in Trentino by working contemporary on three levels: (1) the top-down public broadband infrastructures projects and stakeholders, (2) the middle level composed by projects that are changing the regional innovation system with new rules, institutions, relationships and technologies, and (3) the bottom-up projects that are being facilitated by CREATE-NET and should provide infrastructures and services to specific communities. The “creation of a living laboratory for service experimentation” in the title is referred to the main middle-level project (TasLab) which is member of the Libing Labs network<sup>1</sup>. We intend to facilitate the DE services experimentation because of the CREATE-NET participation in this Living Lab.

In the third phase of OPAALS we will present the challenges and results of the Trentino DCE Living Laboratory, and the Trentino case will be analysed with the other regional cases in the WP11. Therefore this deliverable represents a report on the actual state of the art of the Trentino experience and constitutes a momentary image of a complex innovation trajectory. This intermediary study aims to inform the partners on the process of innovation and is intended to underline many issues that are emerging from the field, like difficulties in creating a participative processes and the trials to introduce DE models and services, more than answering to the core questions (incentives, technologies, ...).

In Chapter 2 we will introduce the growing DCE in Trentino. We will first give an overview of the new regional innovation system plan and of the meaning of the DCE in Trentino. Then we will present the DE development model and the DCE development strategy we are adopting. Finally we will present the Action Research and Participatory Design as the core research methodology.

In Chapter 3 we will present the four “bottom-up” project activities. Accordingly with the development strategy, those activities are facilitated by CREATE-NET in order to make sense of broadband infrastructures and specific services from the grassroots level point of view.

In Chapter 4 we will expose the state of the art of the activities in the TasLab project, which constitutes the core of the DCE living laboratory. First we will present project rationale, the stakeholders and the work plan. Then it will be exposed the preliminary activity we performed to introduce the DE model and services. Finally we will present in detail the early activities and decisions taken within the project.

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1 See: [www.openlivinglabs.eu](http://www.openlivinglabs.eu)

## 2. The growing DCE in Trentino

### 2.1 Overview

The Autonomous Province of Trento<sup>2</sup> (in the following: PAT – Provincia Autonoma di Trento) is actually facing a series of innovations that involve the infrastructures and the ICT services sectors. CREATE-NET is both involved in the ecosystemic model related the new future Regional Innovation Ecosystem and in some specific actions regarding the development of new services and access infrastructures. In this section we will introduce the main elements of this innovation and the relations with the Digital Community Ecosystem idea.



*Figure 1: the PAT position in Italy (Source: Wikipedia)*

#### 2.1.1 Introduction

The Trentino Province accepted the European Lisbon strategy (Consiglio Europeo, 2000) by means of the “Società dell'Informazione” project (Giunta Provinciale, 2003; PAT, 2004). This plan represents a political vision that should work on a local ICT sector where, apart from the fragmentation of the SME-based local ICT sector, the following positive factors have been identified (Camussone et al, 2007; Giunchiglia, 2007, Dalmonego,

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<sup>2</sup> For more infos on the PAT see: [http://en.wikipedia.org/wiki/Province\\_of\\_Trento](http://en.wikipedia.org/wiki/Province_of_Trento)

2008) :

- high density of well known national and international research centers;
- high number of researchers ICT;
- research sector that is increasing, with the help of the PAT;
- public sector inclined to innovation.

The fragmented ICT sector is actually unable to acquire competences from the strong research sector. This is because the SMEs' dimension and culture is not in line with the need to allocate resources and attention to invest in R&D. The current supply chain of ICT-related services for the PA in Trentino is not considering formal moments of interaction between research centers and enterprises (Figure 2). It can be described in 4 phases (InfoTn, 2008):

1. *Strategic plan*. It is realized through a Regional Development Plan (PSP – Programma di Sviluppo Provinciale) written by the Planning Committee of the Local Government (Giunta Provinciale, 2006);
2. *Investment plan SIEP* (Information and Electronic System of the Province). It is realized by the Servizio Organizzazione ed Informatica (Informatics and Organization Service) of the Local Government, and it translates the PSP in intervention areas and ICT projects to be developed (Giunta Provinciale, 2004);
3. *Design and development of services*. InfoTn - the public enterprise that manages the ICT for the local public sector – creates innovation services by considering the innovation products of the local market. The local ICT market is usually unable to participate.
4. *Management of services*. Provided by Informatica Trentina SPA with some feedbacks to phases 1 and 2.



Figure 2: The current supply chain of ICT related services for the PA in Trentino (InfoTn, 2008).



## 2.1.2 The new regional innovation system

The new vision on the regional innovation system can be represented as divided in two steps (Figure 3):

- a) separation of the ICT infrastructures and services management;
- b) reinforcement of the cooperation between enterprises and research centers: through the TasLab project, which will define the new “innovation ecosystem” regarding the ICT-related public sector services in Trentino.

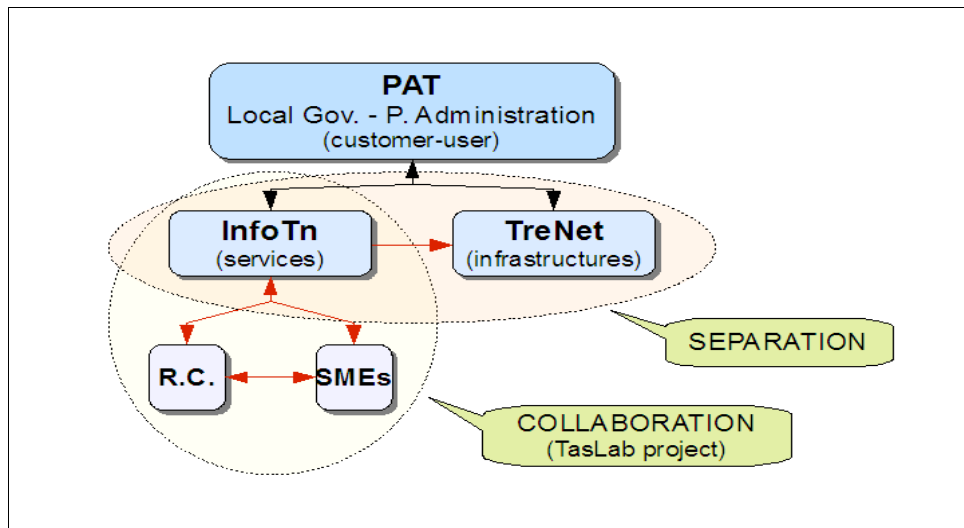


Figure 3: The two main changes in the new Trentino regional innovation system.

### Separation

Informatica Trentina (InfoTn) is a public Joint Stock Company since 1985 that manages the ICT for the local public sector. InfoTn operated and managed the TELPAT, the first broadband network of the Province for providing services to public administrations. The separation of the services/infrastructures management for the public sector is being operated by the Local Government with the creation of Trentino Network (TreNet), the new company in charge of the public broadband infrastructures.

TreNet was initially understood as the InfoTn internal department in charge of the projects related to the new public broadband (T.Net project and sub-projects). In 2004 TreNet became a separate enterprise from InfoTn and is fully controlled by the PAT. In 2009 TreNet will become a public Joint Stock Company like InfoTn.

### Collaboration

In 2006 the Italian act “Legge Bersani”<sup>3</sup> defined the new rules of the game for the services enterprises controlled or owned by public entities. Now those enterprises are not allowed to compete with the other enterprises in the PA services market: PA owned/controlled organizations can not provide services to the PA others than the ones that constitute them. This led the Trentino Local Government to reconsider the position of

<sup>3</sup> Decreto-legge 4 luglio 2006, n. 223, articolo 13, comma 1.

InfoTn inside a new local system of ICT-based innovation for the PA.

The PAT therefore defined in the 2007 a new role for InfoTn (Dalmonego, 2008; Giunta Provinciale, 2007): to stop providing direct ICT services and to become what has been called a “strumento di innovazione” (tool for innovation) inside a more coordinated local innovation system.

During the 2008 InfoTn developed a vision called “Trentino come Laboratorio”, in English “Trentino as a Lab” (TasLab) (see the OPAALS Deliverable 7.2). This vision consists of an ideal perspective and a concrete project. The ideal TasLab perspective (see: [www.taslab.eu](http://www.taslab.eu)) on the local innovation system for the PA based on:

- the Innovation Ecosystem model, based on dynamic and continuous cooperation between local stakeholders;
- the “Tripole” model (Figure 4), based on the high level of collaboration between the local PA (utente/user), ICT sector enterprises and research centers;
- the Living Laboratory framework because of the membership of the European Network of Living Labs ([www.openlivinglabs.eu](http://www.openlivinglabs.eu)), where to experiment local participation practices and patterns;
- the new role of InfoTn: the ecosystem catalyst and innovation facilitator.

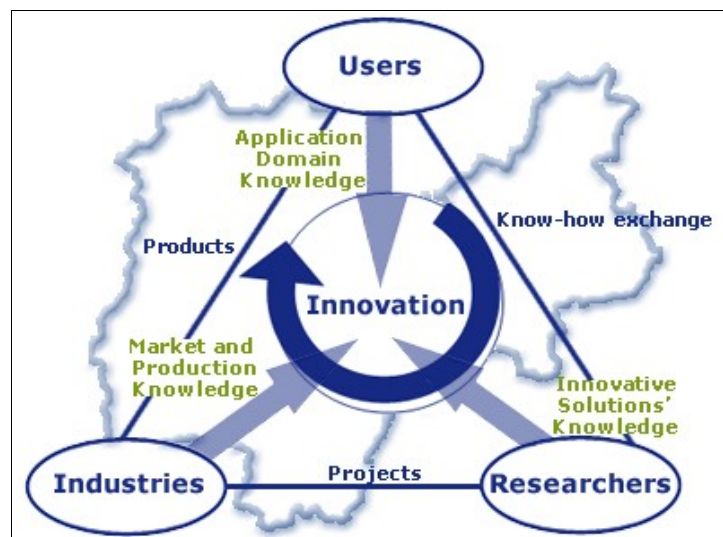


Figure 4: The abstract "tripole" of innovation model in Trentino.

CREATE-NET and the Information Engineering and Computer Science department (DISI) of the University of Trento contributed to the creation of this vision by sustaining the “ecosystemic” and the “tripole” models. The TasLab vision and LivingLab is lead byInfoTn and generated immediately a rich partnership:

- *Public agencies:* PAT, Consortium of the Trentino Municipalities, Public Health Agency, and Trentino Riscossioni (the agencies collecting taxes for the entire local PA);
- *Local enterprises in the ICT sector:* ALGORAB Srl, Centro Ricerche Fiat (CRF), COGITO Srl, DeltaDator Spa, GPI Spa, HEIDI Spa, I&S Informatica e Servizi Srl, Sinergis Srl, Trentino Network Srl;
- *Local research centers in the ICT sector:* CREATE-NET, Fondazione Bruno Kessler

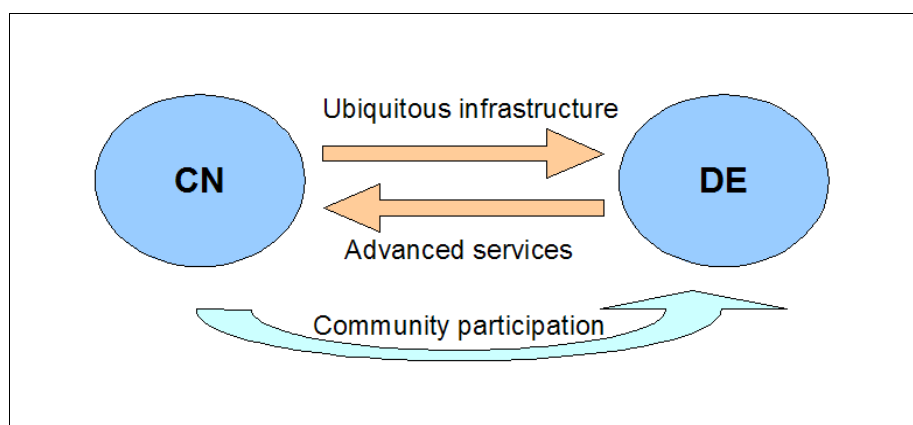
(FBK), GraphiTech, ISTC – CNR, Laboratorio di Interoperabilità ed e-Government (LEGO), University of Trento (Information Engineering and Computer Science department - DISI).

At the end of 2008 the TasLab vision generated an FSE project (FP 2007-13, Axes IV “Human Capital”) called “Trasferimento di conoscenze e know-how tra centri di ricerca e imprese anche attraverso la mobilità di ricercatori e tecnici” (Knowledge and know-how transfer between research centers and enterprises also through researchers' and technicians' mobility”). The objective of the project is to develop a collaboration network between the ICT-related research centers and enterprises, the University, and local public administrations in order to facilitate the local research and innovation in the public sector. This project involves InfoTn as coordinator, CREATE-NET in charge of the ecosystemic model, the Computer and Management Sciences Department (DISA) of the University in charge of the networked organization model, and the Information Engineering and Computer Science department (DISI) of the University for the technology. In this report we will call this project TasLab (Chapter 4) because it aims to design the organizational shape of the regional innovation ecosystem.

### 2.1.3 What does it mean DCE in Trentino

In the Deliverable 12.7 we defined a Digital Community Ecosystem<sup>4</sup> (DCE) as a phenomenon that stands on the line of two possible DE and CN intersections. Therefore DCEs could be considered between (a) DEs empowered by considering the most important broadband-based local phenomenon that is CNs, and (b) CNs with some kind of DE services (Szabo and Botto, 2008). This definition allows us investigating the experimentation of DE concepts, ideas and technologies in the growing context of local public broadband infrastructures and advances services in Trentino.

Two projects are therefore primarily involved in the DCE experimentation in Trentino. The T.Net projects consists of the development of the new regional broadband infrastructure, with related policies for the development of services. The TasLab project concerns the creation of a new regional innovation ecosystem for public ICT services.



*Figure 5: The Digital Ecosystem and Community Network relationship*

<sup>4</sup> For a longer explanation of DCE, see the Deliverable 12.7. For a complete analysis of the relationship between DE and CN, see the Deliverable 7.1.

With the Deliverable 7.1 we learned that the relationship of DEs and CNs could generate a virtuous circle. The Trentino situation is characterizing this intersection as follows:

1. *Ubiquitous Infrastructure*: The public regional broadband infrastructure is bridging the digital divide, by providing internet connectivity to who is working and living in the remote valleys and opening the competition<sup>5</sup> in the local telecom market.
2. *Advanced Services*: Between the many services realized on the CN there could be space for DE services.
3. *Community Participation*: Both the infrastructures (T.Net) and the services (TasLab) projects are mainly defined and managed in a top-down way. The Local Government is using the two controlled enterprises (Trentino Network – Infrastructures - and Informatica Trentina – Services -) to implement the policies. More bottom-up participated practices should be considered.

CREATE-NET is actually involved in every point as follows:

1. On the Infrastructure side we continuously work with Trentino Network and the local ISPs in order to sustain new local connectivity solutions.
2. On the Services side we cooperate with the local stakeholders to develop new services, and on the DE side we obtained from the Innovation Office of the Local Government the informal – but substantial – mandate to investigate the development of DEs in Trentino. This institutional commitment drove the CREATE-NET participation in the TasLab project.
3. On the Participation side we are working with many local stakeholders (Municipalities, ISPs, Tourism offices, enterprises, ...) in order to generate projects and visions that will activate the top-down projects and force the Local Government to define a position on specific community interests like Open Source Software (OSS), bandwidth sharing, facilitated Internet connectivity for associations.

We think that the sustainable creation of a DE in a specific regional business cluster is an important step to reach. Moreover we consider this goal as highly likely to fail for two main reasons. First, due to the technical skills, the SMEs in the local ICT sector are the only ones to address this innovation, but in the Trentino Province they seem unwilling to cooperate without a new and deeper element of motivation. Second, Trentino is a region with a strong and always present public sector, and such an innovation should stay in line with the other local innovation policies, enabling and supporting specific projects. We were therefore interested in finding a DE development strategy informed by those considerations in order to generate a locally meaningful and sustainable innovation.

## **2.2 The DE development strategy**

In the previous sub-section (2.1.3) we explained the core characteristics of a DCE vision in Trentino, explaining the reasons to avoid a “simple” DE cluster enterprises development project. In this section we explain the general “alternative” DCE development model and the specific DCE development strategy we are using.

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<sup>5</sup> Previously Telecom Italia, who is in fact the national telecom monopolist, was not interested to connect the remote parts of the PAT.

## 2.2.1 The alternative DE local development model

In the OPAALS Deliverable 12.7 we explained how we are developing a new DEs dissemination model at the regional level. The orthodox DE dissemination model is based on (Dory, 2007): (a) a preliminary contact between the Regional Catalyst and the Influencers – the Policy and Economic Decision Makers –, aimed to define the political and financial resources; (b) the Regional Catalyst action of specific DE creation, aimed to develop a DE in a specific business sector. Even if this model has been described as not allowing generic “best practices”, requiring instead local practices informed by key factors and some important variables<sup>6</sup> to consider (Passani, 2007).

We are introducing the “alternative” DE development model as inspired by the more relational and ecologic tradition in the Information Systems Research (Star and Ruhleder, 1996; Suchman, 1987) and the translation model of innovation (Callon, 1986; Law and Hassard, 1999). The relational ecologic tradition suggests to follow the local sensemaking<sup>7</sup> practices instead of the formal labels and planned phases. The translation model of innovation suggests to avoid following pieces of innovations as moving as discrete and stable pieces between different contexts. This means that the DE innovation should find and follow specific local meanings and innovation trajectories, and that we should simply facilitate this local adoption as a translation process. In general we can say that the Regional Catalyst should assist this local sensemaking process.

Considering both the identified needs and the emerging issues, what counts in a regional innovation is the virtuous process composed by (a) the addressing of a concrete problem or need, and (b) the new meanings and ideas that emerge from a locally meaningful innovation trajectory. From this point of view the early DBE dissemination model is not wrong but only partial. It addresses the demand for an institutional model and lacks in addressing to the concrete actions and strategies to perform locally. In order to enrich the previous model, in the Deliverable 12.7 we suggest to adopt a participated innovation methodology that should consider the following points of attention:

- *start from concrete local needs*: a DE as a pure research need will be hardly sustainable in time;
- *work with people at the many levels*: in addition to the policy makers, innovation should involve both the management and the lower levels of business organizations and communities;
- *work on what makes sense for participants, not only on the DE idea*: instead of “implementing” a DE (or DCE) as the core objective, focus on developing meaningful innovation for the community and use the DE ideas as a tool;
- *avoid using the term “DE” or “ecosystem”*: the result of this innovation should be something meaningful for local communities also in its label. It is improbable – but not impossible – that they will adopt your own vocabulary.

It should be clarified that avoiding the “DE” or “ecosystem” terms when working with local

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6 Pre-existing socio-economic situation; expectation/vision about DE as technological environment and as a local Innovation process; typology of selected Regional Catalyst; policy makers' level of interest; identified business domain/s; technological development of DE components.

7 For Dervin (1992) sensemaking is performed by individuals when attempting to make sense of observed data, while for Weick (1995) sensemaking is the practice of undertake the resolution of the ambiguous situations in organizations.

actors is different to completely delete those terms. The suggestion regards the need to avoid too specific terms in the local context because: (1) they does not help the emergence of concrete needs and services, and (2) they are clearly understood as buzzwords by local actors, with a consequent decrease of the trusted relationship between researchers and local actors. It could be the case to maintain those terms when negotiating the regional innovation in the political domain, but operational people dislike both those terms and their users. Differently, the research domain will be probably enriched from the association of those high level concepts with specific services and tools.

## 2.2.2 The Trentino DCE development strategy

We therefore suggest an introduction strategy for DCE innovation that instead of focusing on an unique DE implementation project, will sustain (a) the many layers of the Local Government regional innovation strategy, and (b) the ecosystem approach on different layers at the same time. The represents this strategy by taking the example of the Trentino Region experimentation.

The Trentino DCE development strategy consists of tree layers of service-oriented projects that could be grouped as related to (Figure 6):

- A) *top-down technical and institutional conditions* at regional level (on the top),
- B) *intermediate enabling actions* at regional level (in the middle), and
- C) *bottom-up needs* at the specific community level (on the bottom).

At the level A there is the regional publicly owned/controlled telecom infrastructure **project “T.Net”**. As described in the OPAALS D7.2, it is split into two infrastructural actions: the creation of a regional optical fiber backbone (Cabra pj.), and the creation of a wireless access network (WiNet pj.). Since the Trentino region is a mountain area that suffers from the digital divide because of a lack of Telecoms investments, this broadband infrastructure provides the necessary connectivity required by any advanced service in the region.

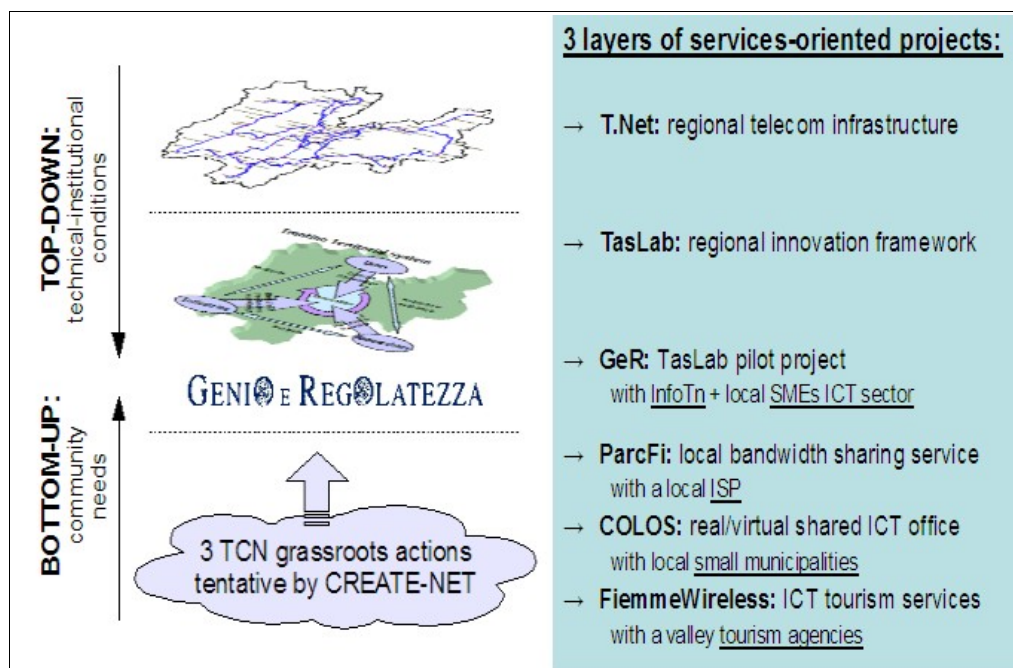


Figure 6: The multiple projects and layers strategy for the Trentino DCE.

CREATE-NET was asked by the Local Government to provide ideas and knowledge for the development of both infrastructure and services. The relevance of level A underlines the need to consider the connectivity infrastructures when doing DEs research (see Deliverable 12.1).

At level B there are a couple of projects that should start the instantiation of DEs in the Trentino region. The “**TasLab**” **project** (Trentino as a Lab, see D12.2) is a LivingLab action that will provide a new regional framework for eInclusion, eMobility , eBusiness / eTourism, eEnvironment and all the regional ICT innovation concerning services for the PA. As we said before, the project is also part of the new operational business plan of the regional agency in charge of the ICTs services for the Public Administration (InfoTn), which is shifting its role from the software/service direct provider to the local facilitator.

The “**Genio & Regolatezza**” (**G&R**) **project** is the first action that should instantiate concretely the DEs idea inside the TasLab framework. If the TasLab aim is to produce innovation procedures that should stay in line with the regional policies and stakeholders, the G&R aim is to start developing a local ecosystem in the ICT SMEs sector. More precisely, it should create this ecosystem and connect it to InfoTn, the core customer.

CREATE-NET at this level is the DEs Regional Catalyst. We spent a significant amount of resources in understanding where and how to connect the DEs framework in the region. The level B underlines the fact that in order to give sense to the DEs framework at the local level, it should give sense to other projects and interests. This means that both projects are not “simply” DEs projects, but actions that connect the many stakeholders (Local Government, InfoTn, University of Trento, CREATE-NET, SMEs) visions and interests with the DEs ideas. How this idea will concretely be translated in practice will be understood after the participated process of innovation.

At the level C there are some bottom-up project plans (**ParcFi**, **COLOS**, **Fiemme Wireless**) facilitated by CREATE-NET with the aim to create a virtuous circle of innovation with the A and B levels projects. Those actions refer to and are intended to be developed with the involvement of specific communities (local ISPs, small municipalities, tourism agencies). The aims are: (a) to answer the specific needs with organizational change and hardware/services innovation in specific contexts, (b) to create best practices to be replicated at the regional level, and (c) to provide more situations requiring the involvement of the local ICT-SMEs Digital Ecosystem (G&R project), and the future creation of new DEs.

CREATE-NET is working at this level in order to approach grassroots users and thus complementing its efforts at the institutional level (A and B). At this level the Community Network and Digital Ecosystems issues could find a development way, but what counts is the specific community need, the availability of funds, the facilitation practice we are performing, and the effective community commitment and participation. The need of “participated actions” has been one of the outcome of the D7.1, referring to CNs and DEs innovation. After the declared interest of local communities (municipalities, ISPs and tourism agencies) we are facing difficulties in both the negotiation phase and the project proposal cooperative writing. This means that participated actions are far from being easily achievable.



## 2.3 Research methodology

We organized the Trentino DCE experimentation as a strategic plan (see previous section) composed by few local innovation projects in which CREATE-NET is variously involved (see Figure 7). The T.Net infrastructural project, in which we are only partially involved as technology consultants, is being entirely managed by the PAT (Networks and Telecommunication Service) and Trentino Network SPA. For this project we use the information we gained for the Deliverable 7.2 and in addition we organized a series of interviews regarding the the regulatory framework of the new public broadband network.

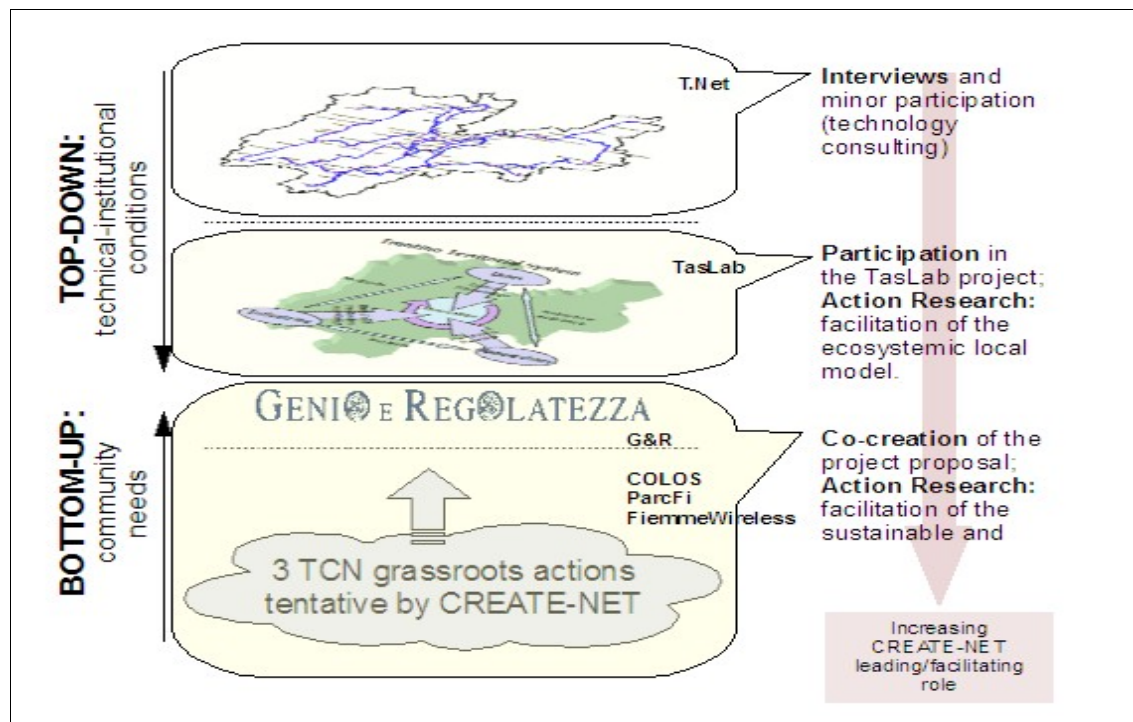


Figure 7: The research methodology in the Trentino DCE experimentation.

The TasLab is currently a project coordinated by InfoTn aiming to set the core rules, procedures and stakeholders for the future regional innovation ecosystem. CREATE-NET participates as a facilitator for the ecosystemic model and the harmonization with the other main constraints, that stem from the local policies/habits and the networked organization model.

The G&R project and the other three more community-related project plans are directly created or co-created by CREATE-NET. The leading role we play in those project is higher than in T.Net and TasLab. In those more bottom-up projects we aim to involve the local interested agencies in participated actions for a sustainable innovation by applying the Action Research methodology.

### 2.3.1 Action Research and Participatory Design

The Action Research (AR) and Participatory Design (PD) methodologies enable us considering, at the same time, organizational and technological development in relation to



specific empirical contexts. Indeed, PD lets us understand infrastructure as something that emerges for people in practice, connected to activities and structures (Star and Ruhleder, 1996), while AR is simply addressing it as the needed background for anything that is organizational-aware. In general we can say that the heterogeneous AR methodology gives the core rules for a research that is primarily an intervention (Greenwood and Lewin, 1998; Reason and Bradbury, 2001).

The first rule is the progressive and iterated problem-setting and problem-solving process represented in Figure 8. This particular research process comes from the early work of Karl Lewin (1946) and it is particularly interesting for us when those ideas have been applied to the socio-technical systems (Trist, 1981a). At the Tavistock Institute of Human Relations, UK, Trist and colleagues were exploring ways to improve productivity and moral in organizations through this research methodology. They defined that in the socio-technical perspective organizations "consist of the relation between a nonhuman system and a human system" (Trist, 1981b).

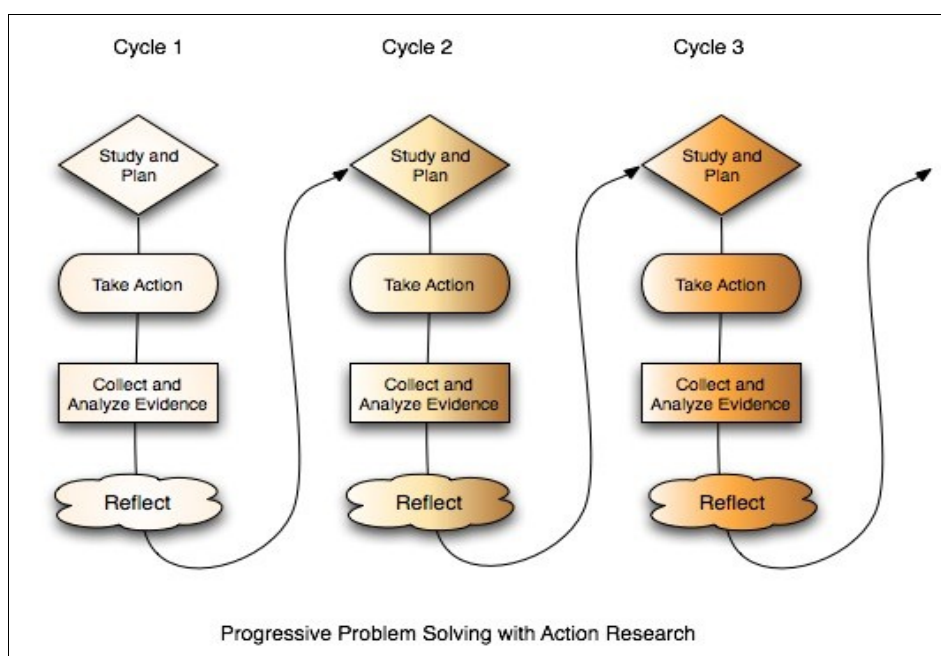


Figure 8: The iterated research process in Action Research  
(Source: [cadres.pepperdine.edu](http://cadres.pepperdine.edu)).

Connected to this iterated research process are the other Action Research principles:

- the first objective is to provide what is needed locally: research goals should be followed after local needs;
- start from concrete local needs developing ideas, visions and and concrete action plans;
- involve local people in real participation at the different levels;
- participants should provide the local knowledge;
- researchers should act as “resource persons”, therefore facilitating the most autonomous local innovation by providing ideas, specific consultancy, and managing the process (“change management” in Action Research);
- participants should provide the choices, based on their local knowledge enriched by researchers facilitation.

Every Trentino DCE project has been created by more formally or informally applying the above principles. We tried to involve the local interested agencies, starting from a concrete need, and working as resource-persons to develop concrete problems and solutions. In so doing, we tried to follow three main objectives:

1. Change: to generate grassroots-driven and sustainable innovation well connected with the institutional axes of the regional innovation;
2. Local innovation vision: to research the ecosystemic vision, by sustaining the regional “innovation ecosystem” Local Government vision;
3. DE research: to experiment the Digital Ecosystem development.

When planning the Trentino DCE projects, we therefore massively used the Action Research methodology. Additionally we occasionally defined Participatory Design as the specific AR extension for technological development. PD methodology in fact adopts the same principles listed above, plus specific tools like prototyping and scenarios, a possible technological evolution of AR (Schuler and Namioka, 1993; Bødker, 1996). The specific methodological choices and tools will be explained in the projects discussions.

### 3. The Trentino DCE bottom-up projects activities

In this chapter the evolution of some bottom-up local projects activities will be presented. Those projects are sustained by CREATE-NET in order to facilitate the DCE development in Trentino. For every activity we will touch the following points:

- Project idea.
- Implication for the DCE.
- Initiation strategy: who, why, how.
- Activities: what happened.
- Conclusions: difficulties, lesson learned, future plans, ... .

#### 3.1 The Genio & Regolatezza project

##### *Idea*

As introduced in Chapter 2, the “Genio & Regolatezza” (G&R) project is the first action conied to instantiate concretely the DEs idea inside the TasLab framework. If the TasLab aim is to produce innovation procedures that should stay in line with the regional policies and stakeholders, the G&R aim is to: (a) implement the SEI CMMI<sup>8</sup> Constellation Model for acquisition of products, business models and services at InfoTn; (b) start developing a local ecosystem in the ICT SMEs sector. More precisely, the second one should create this ecosystem by developing the local consortium of ICT SMEs (CONIT) and connect it to InfoTn, the core customer (see Figure 9).

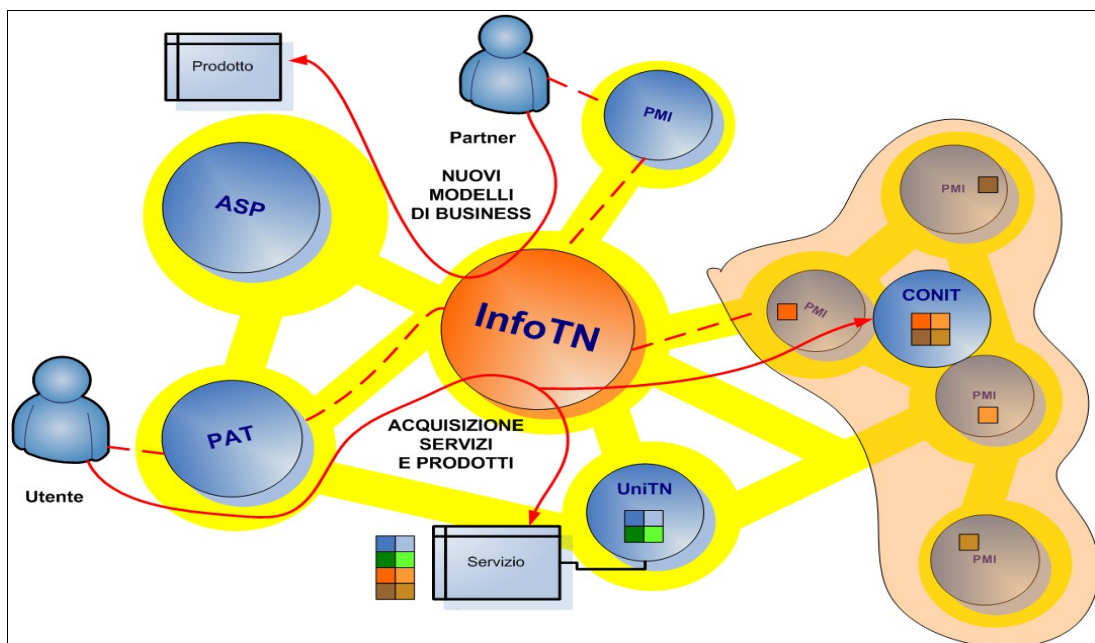


Figure 9: an early image representing the G&R project idea.

8 <http://www.sei.cmu.edu/cmmi/>

### DCE implications

In terms of DE, the G&R project was created to generate a flexible and cluster specific DE with two aims: (1) sustain the public ICT services' regional innovation system with a local ICT-SMEs digital ecosystem, and (2) develop this ecosystem in order to create a virtual organization that will both answer the needs of the whole Trentino and also approach global markets. Therefore this project has been described to the Local Government as the main action to connect the regional innovation system with the T.Net public broadband infrastructure via a DE architecture (see Figure 10).

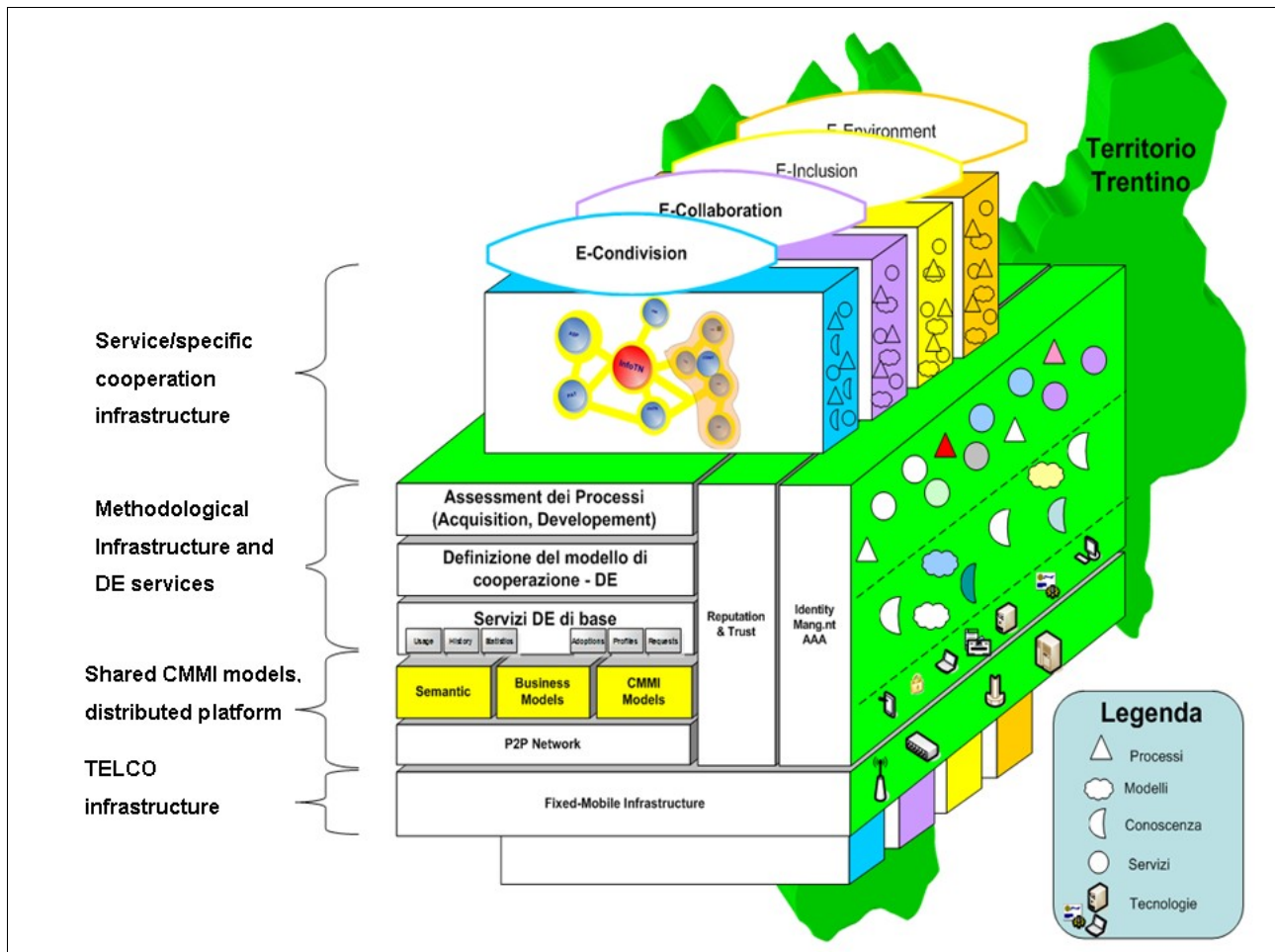


Figure 10: the G&R project layers in an early image.

### Initiation strategy

The project proposal started in the spring of 2007 with the idea of NOUS23, a local consulting agency, to facilitate the implementation of the SEI CMMI processes in InfoTn. The first negotiations started between NOUS 23 and InfoTn when CREATE-NET suggested to catch the occasion for implementing and developing a DE of SMEs, in order to enhance a better relationship between InfoTn – the local buyer - and the technology and services providers.

### Activities

The Genio & Regolatezza project idea has been lead by NOUS 23 and CREATENET had just the chance to participate at one of the negotiation meetings with InfoTn, in order to present the DE idea. The writing of the project proposal started at the beginning of 2008 and generated the final document in June 2008. After this date it was impossible to know what happened to the proposal: NOUS 23 disappeared and we are still waiting for any news.

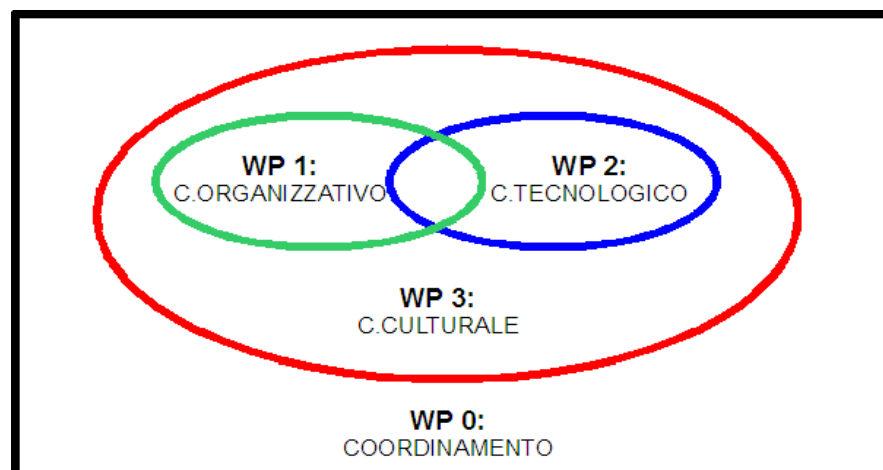
### *Conclusions*

The CREATE-NET strategy has been to use the NOUS23 idea to enter InfoTn and start the local dissemination of DEs. When the first G&R idea was moving along the first steps, we also started cooperating with InfoTn in order to build the TasLab vision. Then G&R became an useful project to sustain the future regional innovation system. Therefore we can say that, even if the project disappeared, its negotiation phase has been a foundational step for introducing the DE ideas inside the local innovation discourses and projects.

## **3.2 The COLOS project**

### *Idea*

COLOS (*Comunità Locali Open Source* – Open Source Local COmmunities) is a project proposal that aims at developing the Open Source culture in the Trentino's small municipalities by leveraging on a needed inter-organizational and technological change (see Figure 11). The plan is to coordinate an Action Research and Participatory Design intervention in deep participation by the local partners, in order to sustain the OS culture when answering the specific needs of Municipalities and the Local Government.



*Figure 11: a simple image used to explain to the stakeholders how the three changes (organizational, technological and cultural) are related in COLOS.*

The project idea comes from a similar proposal created in the 2005 by the University of

Trento<sup>9</sup>. The first ICT need of Trentino's small municipalities was identified as to start managing the ICT from the inside, with the creation of inter-municipalities ICT offices. In fact, small municipalities do not have resources for establishing ICT offices, and perceive this as a big problem<sup>10</sup>. The effects of this change should be reduction of ICTs costs<sup>11</sup>, better control on consulting agencies and suppliers<sup>12</sup>, and the possibility to introduce Open Source software and eGovernment in the municipalities.

### *DCE implications*

The COLOS project represents a conjunction between the PAT interests in creating innovations that highlight the role of the T.Net public broadband infrastructure, and the creation of services for the small PAs. Specific DCEs implications are:

- community: the project was planned to create innovation by managing the cooperative work between some small municipalities, research centers, and some local ICT-sector SMEs;
- DE: it was conceived to (a) help the development of the OpenSource-sector SMEs digital ecosystem, and (b) sustain the future proliferation of advanced services in the municipalities OS ecosystem;
- infrastructures: the project provided the possibility to monitor and develop the specific municipalities access points of the T.Net infrastructure;
- services: after a first step of basic services for the shared ICT office, the intention we have is to start evaluating the possibility to work on P2P DE services;
- governance: the project is intended to create sustainable innovation for small municipalities by involving them in a participated process and providing them the knowledge and tools to autonomously manage the new infrastructures and services.

### *Initiation strategy*

The strategy to build up the COLOS proposal is connected to the involvement of the partners and the specific research call that has been used in order to shape the proposal. By re-using the ideas of the past proposal that has been exposed above, we started discussing about COLOS in the context of a research call on "Territorial networks of culture" (in Italian: Reti territoriali di cultura) financed by a local bank foundation. Since the call was centered on "culture", we focused the proposal on the Open Source culture.

CREATE-NET lead the proposal by working with other two local stakeholders: the municipality of Isera who is the leader of the Vallagarina<sup>13</sup> area, the Competence center on OS (CentrOS) of the FBK research center in Trento, and CREATE-NET. The second level stakeholders, that were considered as knowledge, technology and policy providers, were: the consortium of the province municipalities, the service organization and ICT of the PAT, the local ICT SMEs focussed on Open Source, some municipalities with OS experience, and the local OS and Linux community.

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9 Francesco Botto, now in CREATE-NET and author of this deliverable, leaded the proposal from the Computer Science and Organization al Change Laboratory, Department of Sociology.

10 In 2005 a municipality manager came to the University of Trento asking an help to creating an inter-municipality ICT service.

11 Small municipalities spend a lot in ICT consulting.

12 Small municipalities often do not really know what and how they need in terms of ICT, therefore consulting and supply agencies easily do their own businesses.

13 <http://it.wikipedia.org/wiki/Vallagarina>



As shown in Figure 12, the municipalities (“comuni”) are considered the center of the project, in order to maximize their involvement and improvement. It has been decided to start with a feasibility study, whose structure is represented in Figure 12, in order to define a better operational project. It has been agreed that the three 1<sup>st</sup> level partners will cooperate in the following Work Packages:

0. Coordination: lead by CREATE-NET through the Action Research methodology;
1. Organizational change: lead by the municipality leader, it will create an inter-municipality shared ICT office;
2. Technological change: lead by CREATE-NET, it will test the existing infrastructures and services, then it will create the ICT in support of the new shared office;
3. Cultural change: lead by FBK, it will (a) organize workshops and meeting on the role and use of OS software in the network of municipalities, and (b) create a network of relationships between the municipalities and the local entities in support of the OS technology and culture.

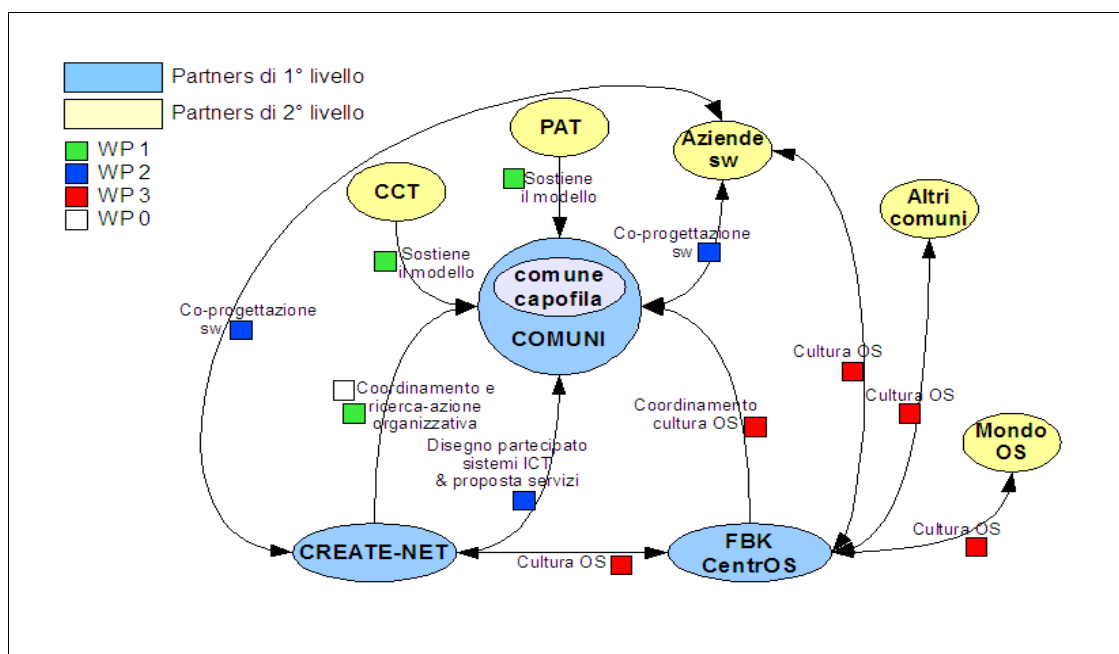


Figure 12: the planned relationships of the COLOS project as agreed from partners.

The strategy was to provide a two methodological circles (feasibility study and operational project) in a first concrete setting (the Vallagarina Municipalities in Trentino) in order to create a model that would be replicated in the whole Provence.

## Activities

At the beginning of 2008 CREATE-NET started reflecting about the project idea with FBK. The idea was to catch the occasion of a local bank foundation call for projects in order to investigate the idea in depth, start the negotiation with a local municipality community, and submit a proposal for the feasibility study.

Then around ten Vallagarina municipalities have been contacted by CREATE-NET and a

discussion started on their needs and perspectives in terms of ICT management and eGovernment innovation. They agreed on the need to work for a organizational and technological participatory experience, with the support of workshops and events relating the Open Source culture. They also identified the Isera municipality as their leader because it is the most skilled and capable to perform and follow innovation projects. They did not, however, participate in the writing of the project proposal that CREATE-NET submitted at the end of March 2008.

In June 2008 we understood that the proposal was evaluated very well by the reviewers, but they decided not to accept it because of the visible lack of concrete participation of the municipalities.

### *Conclusions*

Actually the project proposal is frozen and CREATE-NET is waiting for: (a) some concrete PAT policies about the Open Source in the local PA, and (b) to hear from the Open Source local community (associations, SMEs, competence centers, opinion leaders, ...) a good strategy of action. The main lesson learned from the COLOS experience is that the participation of municipalities should be higher from the beginning, especially in the pilot project. Therefore in the future attempts we will try to involve a municipalities community where the leader municipality could be less able to manage innovation projects, but more willing to be involved in real cooperative work from the beginning.

## **3.3 The ParcFi project**

### *Idea*

The Parc-Fi (Parental Control Wi-Fi) project aims to create an advanced service for the entire Trentino Province territory based on:

1. the sharing of internet connectivity coming from the wireless public access network called WiNet;
2. the service providing a secure fruition of web contents, because of a new “parental control” system.

Inspired to the FON and Spark-Net services<sup>14</sup>, the project moves through the proliferation of wireless access points available on the territory without increase the number of physical access points. The objective of Parc-Fi is to expand the possibility to get an internet connection through the bandwidth disposed by the same users, because of a specific Hardware and Software device that will allow the sharing and a regulation of identities and accesses to the service. This has been considered will have positive effects both on citizens and to the tourism sector.

The parental control system on web contents is a service that many ISPs clients actually request. The idea in Parc-Fi is to develop a centralized service managed directly by the ISP in collaboration with the parents suggestions through a simple web 2.0 service. The study of parental control systems installed on the clients shows in fact the ability of the young generation, usually more skilled than the parents, to skip the control. The service

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<sup>14</sup> [www.fon.com](http://www.fon.com); [www.sparknet.fi](http://www.sparknet.fi)



will be optional and configurable by the client.

### *DCE implications*

The Parc-Fi project represents an advanced service that, if created with the support of the Local Government, can be identified as a “New Government 2” type, or type 4, of Community Network (see: Botto and Passani, 2007). Type 4 CNs are public broadband infrastructures that also provide public advanced services. It emerges from the interaction between CREATE-NET and a local ISP, a business actor interested in providing new and useful services for the territory.

### *Initiation strategy*

The project idea started to be developed when WinNet, a local ISP, asked CREATE-NET to be helped in the creation of a proposal for the “Trentino legge 6”. It is a local call for industrial projects managed by the Local Government with the aim to co-fund innovation initiatives that will also help local enterprises in acquiring skills and relationships. WinNet asked to CREATE-NET to evaluate the parental control system idea, and CREATE-NET suggested to introduce it inside a more value added innovation, that is the sharing connectivity service. We started creating the project proposal with the idea to work for a three steps long innovation:

1. a feasibility study, where to collect the informations and write a better operational project;
2. a pilot project, where to create the service on a specific area composed by many municipalities;
3. the extension of the service on the entire Provence territory.

### *Activities*

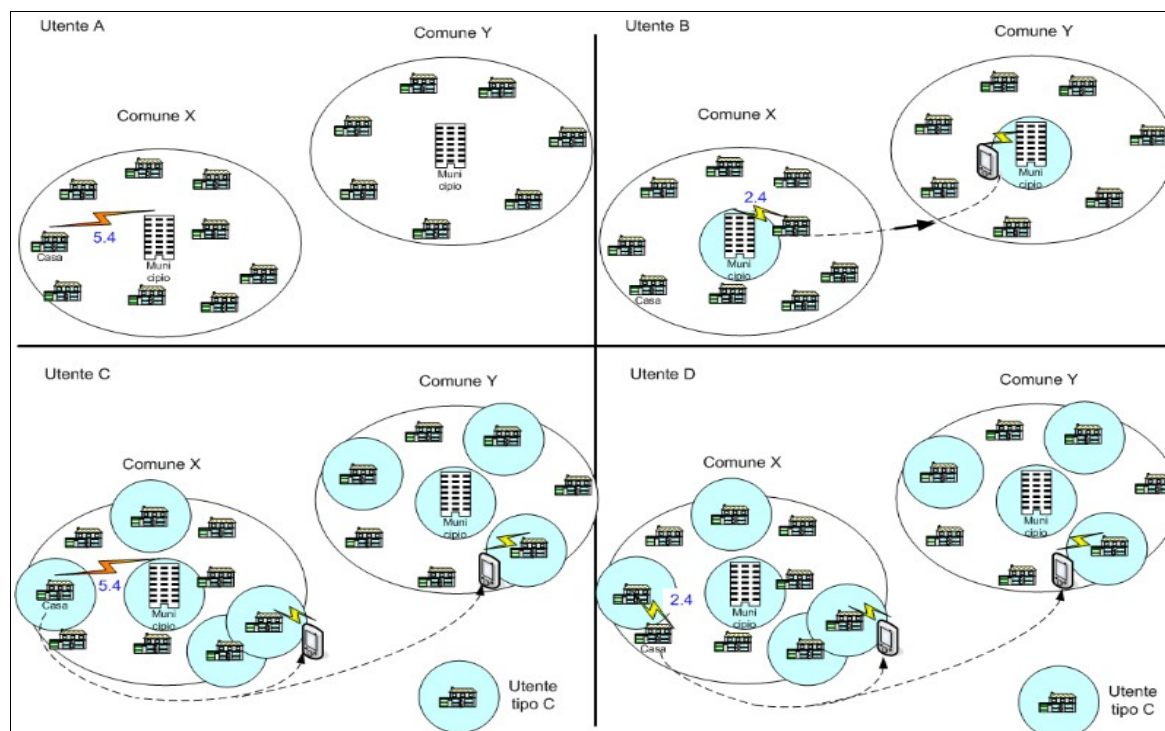


Figure 13: the four typologies of users/services considered in Parc-Fi.

There are two kinds of activities we performed for the Parc-Fi project: the creation of a proposal for the call with a deadline in June 2008, and the negotiation with the PAT in order to check and sustain the relevance of this service for the Province. The cooperative work between CREATE-NET and Win-Net created the project strategy described above and five specific services/users. Services C and D improve standard services A and B with the sharing of connectivity, while E is a specific and temporary service for tourists (see: Figure 13):

- A) The service for the “standard” user is internet ADSL-like connectivity at home provided by a 5.4 GHz wireless coming from the municipality unique access point (AP).
- B) The service called “fixed and nomadic restricted” is a 2.7 GHz wireless signal to the home plus the nomadic service on every municipality wireless AP.
- C) The service called “re-distributor user” is a 5.4 GHz wireless internet to the home, plus the nomadic connectivity to all the municipalities APs and the others re-distributors users APs. This user shares the 30% of his/her home connectivity.
- D) The service called “fixed and nomadic extended” is a 2.7 GHz wireless connection to all the municipalities and the homes hotspots.
- E) The service called “only nomadic extended” is the temporary service D, available via online registration, that has been shaped for tourists in Trentino.

On the side of the negotiation of the project with the PAT, in June 2008 CREATE-NET had the answer that the project is very interesting, but it would be more appropriate to submit it as part of the FESR 2007-2011 European program for the Province of Trento.

### *Conclusions*

The shift of Parc-Fi into a FESR proposal means that in the future the PAT will manage the helm, with good political opportunities for the project in terms of and regional system of innovation. On the other hand, in November 2008 there have been the PAT elections and the project has been frozen for at least one year because of it. The project is therefore actually in standby, waiting for the creation of the Province FESR proposal.

## **3.4 The Fiemme Wireless project**

### *Idea*

The project aims to improve the tourism sector in a famous winter sports valley (Fiemme Valley<sup>15</sup>) by creating high level internet services. It has been considered to answer to the request of the tourist of the future, that will ask for services through the smartphone. Therefore the project considers:

- communities: local stakeholders, facilitators and research centers, and tourists;
- infrastructures: a wireless Mesh extension of the WiNet Public broadband infrastructure;
- services: addressed to both specific events and more continuous interests;
- governance: CREATE-NET will facilitate the innovation process with a participated

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15 [http://en.wikipedia.org/wiki/Val\\_di\\_Fiemme](http://en.wikipedia.org/wiki/Val_di_Fiemme)

Action Research methodology (see Figure 14 as a draft for negotiating the project phases locally: the first circle is the feasibility study, the second one implements the first actions and re-defines the future ones), while the local actors will entirely manage the future infrastructures and services.

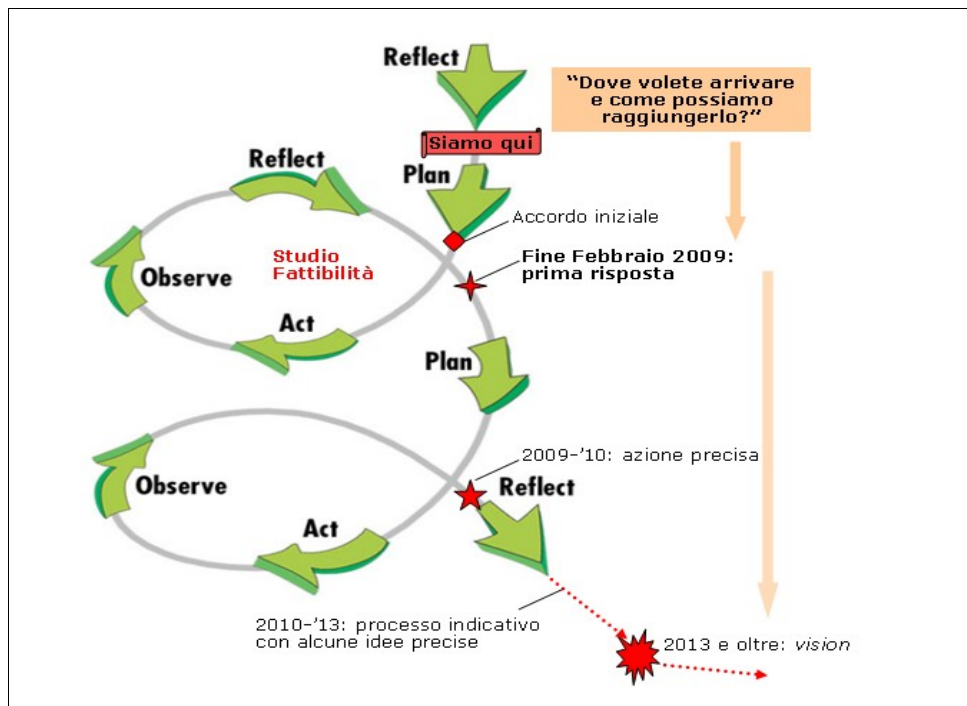


Figure 14: a first draft of the participated trajectory of Fiemme Wireless.

### DCE implications

In terms of Community Networks, Fiemme Wireless is about the creation of a Wi-Fi Mesh community Network as an extension of the PAT public CN. This action has been planned by deeply involving local partners in cooperating in an Action Research project. In terms of Digital Ecosystems, as the participatory project will highlight, on this local CN will run more simple and advanced services, and it will be an opportunity to work on future DE services. It will be also an opportunity to connect to this market a future possible DBE or cluster of local ICT sector SMEs.

### Initiation strategy

The project idea faced a first tentative starting from December 2007, by trying to work with the Polsa Valley<sup>16</sup> in Trentino, a mountain area that need for innovation in order to overcome the tourism sector crisis. After 4 months of negotiation with the valley consortium that coordinates the tourism sector CREATE-NET understood that the local stakeholders, even if interested in the project, were not able to take any decision because of the political problems of the consortium.

16 <http://www.tr3ntino.it/en/winter-sports/skiing-areas-in-trentino/-vallagarina/polsa-san-valentino.html>

We therefore decided<sup>17</sup> to suggest a similar project to Fiemme Valley, that is the most experienced valley in terms of innovations in Trentino. We therefore started negotiating with the local agency for the tourism (APT Fiemme<sup>18</sup>) and the agency in charge of the 2013 Nordic Ski World Cup<sup>19</sup> (Nordic Ski). The 2013 event became the punning element for the project, that became a possibility to ensure continuous infrastructures and services for the valley through technologies and funds addressed to the ski world cup.

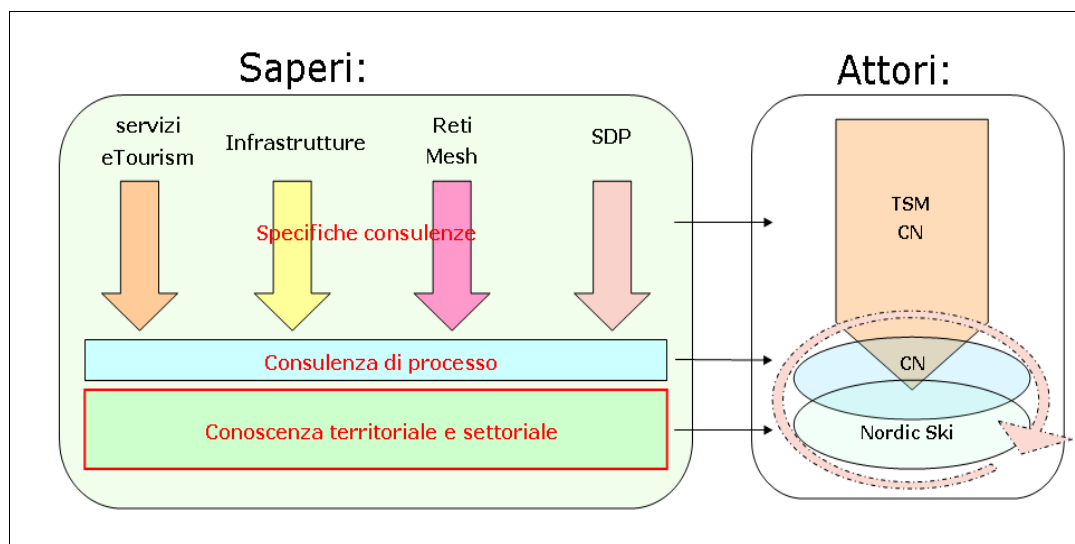


Figure 15: Knowledge ("saperi") and actors ("attori") involved in Fiemme Wireless.

The plan of the actors and knowledges involved in the project is reported in Figure 15. With the facilitation of CREATE-NET, Nordic Ski will participate in every step of the intervention. The innovation will be created by working on the intersection of the specific competences, provided by the different partners:

- Local competences: Nordic Ski;
- Process consultancy: CREATE-NET, OSCO area;
- eTourism services: Trentino School of Management;
- Infrastructures: CREATE-NET, ECC area;
- Mesh networks: CREATE-NET, Pervasive area;
- Service Delivery Platform: CREATE-NET, OSCO area.

### Activities

CREATE-NET spent some months to agree on a shared preliminary plan with the local stakeholders. We started by meeting the APT Fiemme director in August 2008, in order to identify the key actors possibly interested. Between September and October 2008 we organized a couple of other meetings with Nordic Ski (NS), in order to present and start discussing the early proposal. Since the Director of NS needed a more detailed plan – activities and costs – to introduce it to the Board of Directors.

In November CREATE-NET started an early survey to anticipate part of the feasibility

<sup>17</sup> CREATE-NET decided under suggestion of a Trentino School of Management (a local institution expert in tourism) consultant.

<sup>18</sup> [www.visitfiemme.it](http://www.visitfiemme.it)

<sup>19</sup> [www.fiemme2013.com](http://www.fiemme2013.com)

study and identify specific technology in use, people do be involved, needs, actions to perform. On this data we identified the project as divided in three phases (Figure 16):

1. [Deadline January 2010] empowerment of the broadband infrastructure, creation of the Wireless Mesh networks, creation of some core and simple services in a Web Portal;
2. [Deadline 2013] creation of the Service Delivery Platform (SDP) – that will be locally managed - and of the first advanced services (as VoIP, location based services, videostreaming, ...) that will run on it and will be provided by specific providers;
3. [Continuous] improvement of the whole system.

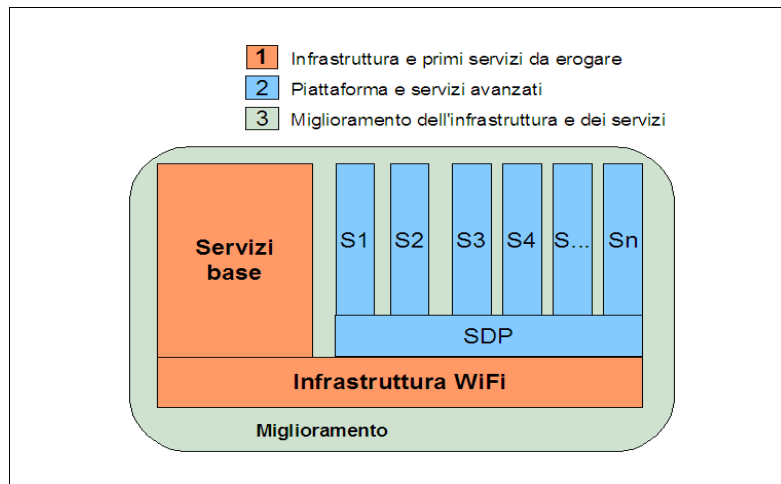


Figure 16: the three steps and kind of costs succeeded by CREATE-NET in Fiemme Wireless.

In November 2008 The answer from the Nordic Ski Board of Directors was that even if the project is a good opportunity for the valley, it will need some time for start it. The budget for the World Cup 2013 is not enough to cover all the planned innovations and they are waiting for an financial agreement with the PAT in order to cover part of them. Therefore the project is actually frozen in order to define the funding trajectory.

## Conclusions

Fiemme Wireless is an interesting project for CREATE-NET since it involves many internal experiences and looks for the creation of a sustainable set of advanced services. Those services will be enabled only in concordance to the rules of the SDP that will be managed locally, giving the governance of the services to the local stakeholders. This will enable an ecosystem of services that will autonomously evolve or die, in relation to their consumption and management. The technological infrastructure simply enables the consumption of those services in an ubiquitous way in some areas of the valley. We are therefore waiting for the PAT decision on the budget to be spent.

## 4. TasLab project: the core of the DCE living laboratory

As explained in Chapter 2 the “Trentino as a Laboratory” (TasLab) is primarily a regional development vision developed by Informatica Trentina SPA (InfoTn) – the public Joint Stock Company that manages the ICT for the local public sector – jointly with a few University departments and research centers. This vision is aimed at developing the new regional collaborative innovation system for the creation and delivery of ICT services to the local PA.

The TasLab vision (see: Deliverable 7.2, Chapter 2 of this report, and [www.taslab.eu](http://www.taslab.eu) ) contains four core elements:

1. an Innovation Ecosystem model,
2. a “tripole” model of collaboration between the local PA, ICT enterprises and research centers,
3. a Living Laboratory framework, and
4. a new “facilitator” or “catalyst” role for InfoTn.

What we call TasLab project in this report is the FSE project (FP 2007-13, Axes IV “Human Capital”) called “Trasferimento di conoscenze e know-how tra centri di ricerca e imprese anche attraverso la mobilità di ricercatori e tecnici” (Knowledge and know-how transfer between research centers and enterprises also through researchers' and technicians' mobility”). In this chapter we will present the TasLab activities by focusing on the Digital Ecosystem model applied to the regional innovation plan.

### 4.1 Project initiation and rationale

#### 4.1.1 Objectives, stakeholders and roles

Through the cooperation between the local PA, ICT enterprises and research centers - and University -, the TasLab project objective is to develop a positive regional environment in terms of innovation for the PAs' ICT services. This project aims at defining both the organizational (processes, patterns, ...) and the ICT infrastructure to support the cooperation and knowledge movement. Therefore, specific objectives of the project are the definition of the networked organizational model, the enabling processes, the related tools and methods, the cooperative core scenarios, and the ICT infrastructure.

The project stakeholders are:

- *InfoTn* (Informatica Trentina SPA – agency in charge of the ICT for the local public sector): project coordinator and leader regarding the micro-processes planning (WP3), the prototype development of the network (WP5), and dissemination (WP6);
- *PAT* (Provincia Autonoma di Trento – the Local Government): as customer and user of every innovation service, the PAT is variously involved in all the project activities;



- CREATE-NET: WP1 leader for the definition of the requirements of the TasLab early model based on the local, the ecosystemic and the networked organizational model requirements. CREATE-NET participates in the ICT infrastructure plan (WP4) and monitors the entire project in terms of organizational model implementation;
- DISA (Dipartimento di Informatica e Studi Aziendali, Università di Trento - Computer and Management Sciences Department): WP2 leader on the organizational model inspired by the networked organization;
- DISI (Dipartimento di Ingegneria e Scienza dell'Informazione, Università di Trento - Information Engineering and Computer Science department): WP4 leader on the ICT architecture of the TasLab.

Figure 18 represents the early vision of the Digital Ecosystem model applied to the TasLab. Before starting the concrete discussion on how to approach the concrete project action, CREATE-NET drew a multidimensional view (horizontal and vertical) in order to anticipate the complexities of the DE approach to the project partners. The horizontal dimension concerns a DE architecture to support the cooperation in the regional innovation system (or the innovation “tripole”, see Figure 4). The vertical dimension represents the Trentino’s vocation innovation areas for the PA, namely those areas which are core in the Trentino value system (e.g., eInclusion, eMobility, eBusiness and eTourism, and eEnvironment).

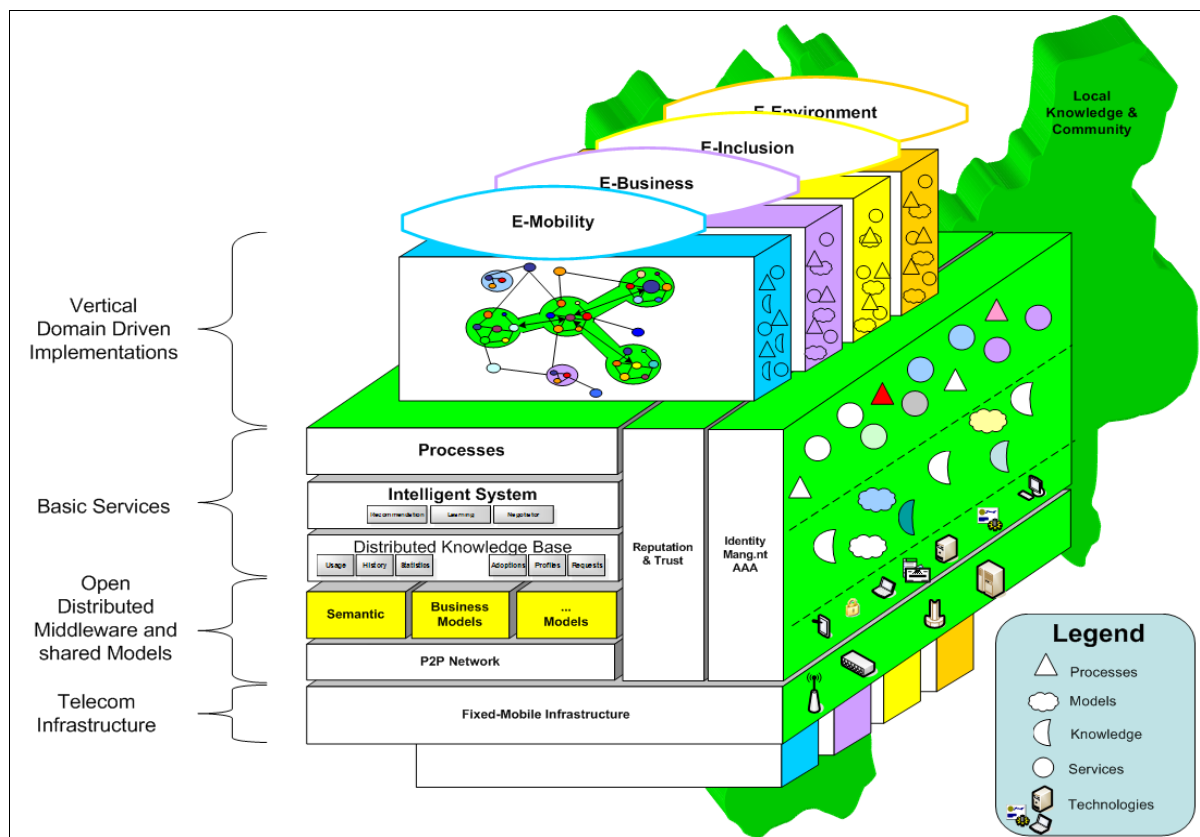


Figure 17: The first vision DE model for TasLab (Source: Botto, Danzi and Telesca, 2008)

### 4.1.2 Activity plan and DEs

The TasLab project plan (see Figure 18) starts with a WP1 that should identify the main organizational requirements. This requirements will influence the organizational model (WP2) by considering the local requirements and constrains, the ecosystemic model and the networked organization model. CREATE-NET is therefore leading the WP1 in order to introduce and evaluate the interest for the Digital Ecosystems while facilitating the emergence of needs, interests and power relationships in the discourse about the new regional innovation system.

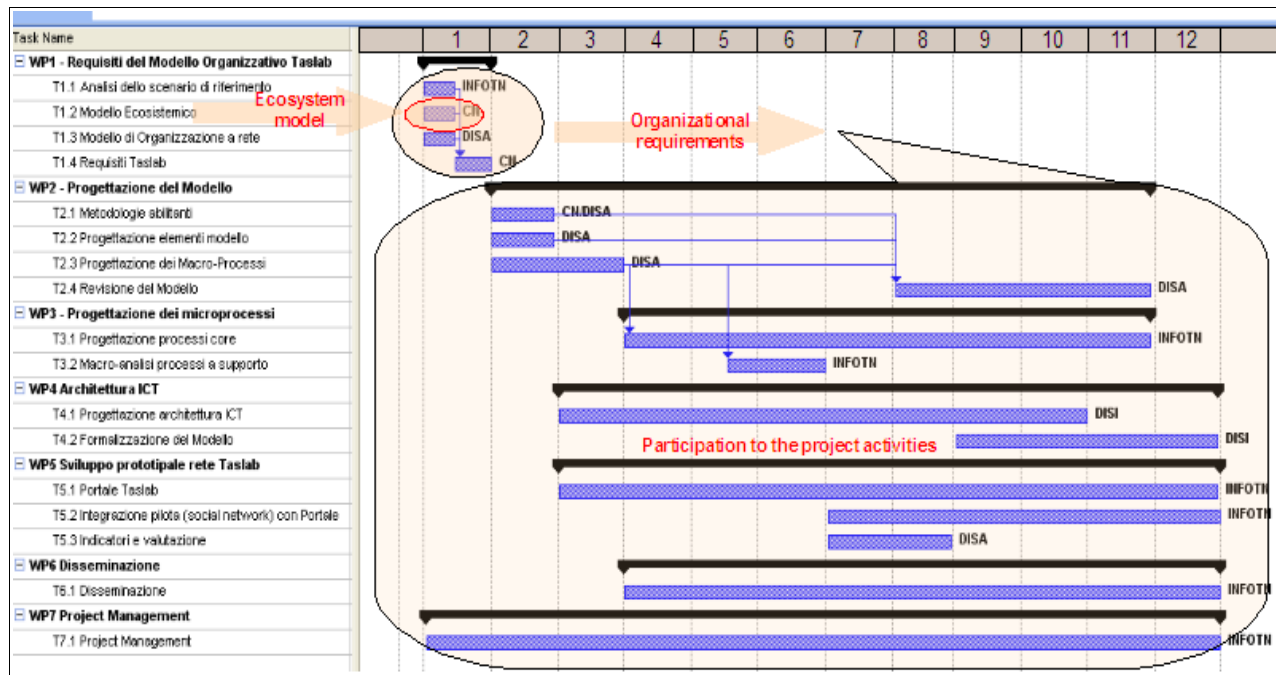


Figure 18: CREATE-NET involvement plan in the TasLab project

The WP1 will influence not only the organizational model (WP2) but also the design of micro-processes, the ICT architecture, and the specific IT devices like the web portal and the Social Network tool. CREATE-NET is involved in all those activities in order to sustain the organizational requirements.

On the 10th of September 2008 the project partners met at the kick-off meeting and the starting point of the project should have been September. During the meeting the coordinator communicated that the formal start of the project would be postponed because of bureaucratic problems. It has been said that the project would probably start in December, then the partners decided to start working informally in order to perform a better organizational requirements activity. The project formally started in April 2009, with a delay of seven months, then it will finish at the beginning of April 2010.



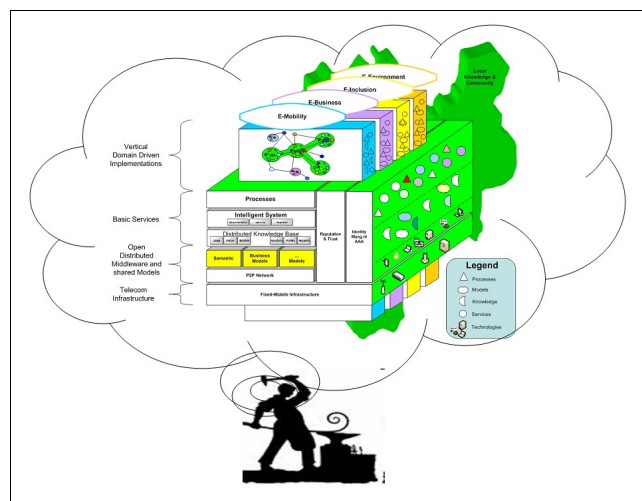
## 4.2 The recommended ecosystem model

The work done on the ecosystem metaphor and the DE model in TasLab – at the beginning of June 2009 – is divided in three phases, that will form the following chapters:

1. the early DE model proposal and discussions;
2. the plausible approaches for the DE model in TasLab;
3. the starting discussions on specific DE services in TasLab.

### 4.2.1 The early DE model proposal and discussions

As WP1 leader, CREATE-NET asked for the circulation of a first documentation regarding the local level institutional and political requirements/constraints influencing TasLab (from InfoTn) and the definition of the networked organization (from DISA). We asked for a clear explanation of the issues, plus a starting reflection on how the models could be connected to the TasLab. In October 2008 CREATE-NET started the circulation by delivering an explanation of the European DE model as it comes from the DBE project, with some corrections addressing the latest understandings of the OPAALS project.



*Figure 19: The image used to push the project partners through a pragmatic approach to DEs.*

Considering the fact that the DE model is usually seen as too abstract and complex when discussing about concrete needs, when presenting this document we suggested to adopt a pragmatic approach (Figure 19). With this approach it is possible to move from a vision to the reality by:

1. a cooperative effort that starts considering the contextual and motivational variables where to possibly implement DE services;
2. understanding and evaluating the technological and organizational requirements of the DE model by clearly identifying what is needed and possible and what is not<sup>20</sup>;
3. considering the fact that the European DE/DBE model is not actually based on working technology solutions – at least in terms of EvE and ExE – and best practices.

<sup>20</sup> CREATE-NET stated that the DE model should be useful for the local interests, therefore the our pragmatic mission is not to apply the model but to facilitate the local development trajectories.

As anticipated in the previous point 2, at the end of a capillary explanation of the DE idea and model we generated a list of organizational and technological requirements (Figure 20):

- **CORE REQUIREMENTS:**
  - Distribution:
    - Org.: distributed competences and skills
    - Tech.: enabling P2P architecture
  - Flexible leadership:
    - Org.: self and distributed power between participants
    - Tech.: Virtual Super Peers architecture
  - Openness:
    - Org.: open participation
    - Tech.: Open Source Software and possible DEs network
  - Autonomous evolution:
    - Org.: auto-regulation of clusters (policies defined before)
    - Tech.: auto-composition of services
- **SUGGESTED ADDITIONAL REQUIREMENTS:**
  - Participated development
  - Synergy between local innovations

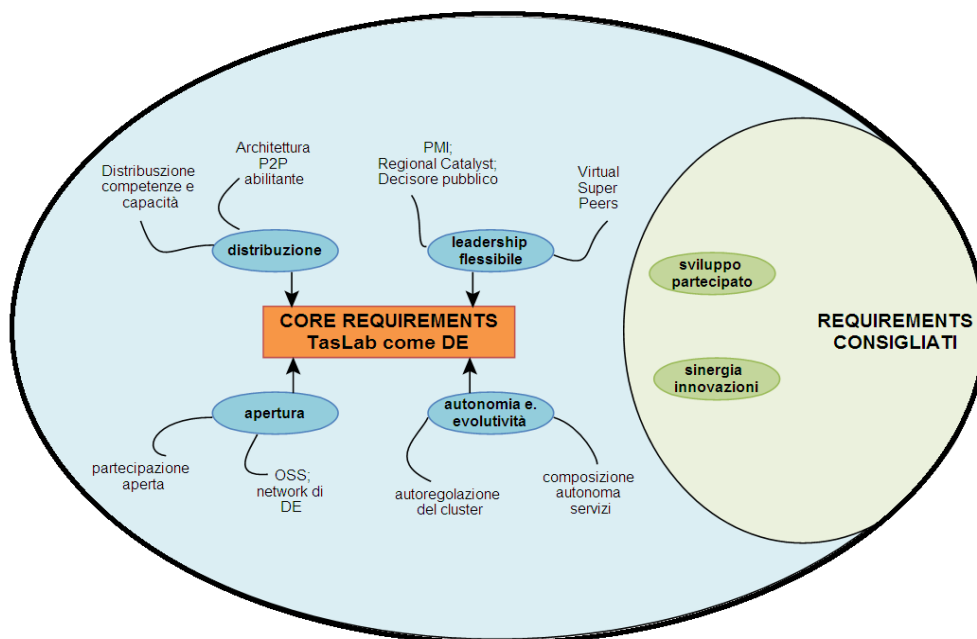


Figure 20: the high level requirements suggested to follow the DE model in TasLab.

## 4.2.2 The plausible approaches for the DE model in TasLab

In January 2009 we re-opened the discussion about the role and the strategy for introducing the DE model in TasLab. In October the partners read and discussed the document we presented, opened a discussion about what is plausible and what not. Therefore we collected from project coordinator (InfoTn) three ideas:

1. *Ecosystemic metaphor*: the regional innovation system could be understood as an ecosystem (see Chapter 4.3.1).
2. *Regional innovation system and DE*: we will evaluate if and how to introduce the DE model in two separate time periods:
  - considering the organizational processes: from the beginning of the research;
  - introducing DE technologies: later.
3. *The local ICT SME cluster*: it is possible to develop the cluster with some DE services or building a DBE, but in this case it will be another project (Genio & Regolatezza or similar).

We slowly understood that the ICT technologies we can work on are already understood. InfoTn is forcing the project through its interests, in front of the many stakeholders ones, and through its organizational/technological standards. This means that the expected ICT technologies for TasLab will be a web portal with the same standards of the whole InfoTn information systems. The emergence of those decisions and data are explained in Chapter 4.3.2. In general this means that it will be difficult to introduce DE technologies in TasLab, and that we will follow the strategy to work on specific DE services.

## 4.2.3 The starting discussions on specific DE services in TasLab

In May 2009 we started interacting with some Innovation Managers (IMs) of InfoTn, that will be the future facilitators of innovation in TasLab (see Chapter 4.3.3), in order to work on the future DE services. With TasLab InfoTn is trying to position its IMs between the demand, provided from the local PA, and the offer of ICT services and technologies. If actually it is difficult to imagine a proper ICT-SMEs digital ecosystem, the idea is to work on a service that is in line with the IMs needs to work comfortably with an SMEs cluster.

On the 21<sup>th</sup> of May 2009 CREATE-NET organized a meeting with two IMs in order to start discussing about the new DE service created through the EC 6FP “ONE” project<sup>21</sup>. The Open Negotiation Environment project allows organizations to create contract agreements in order to supply complex, integrated services as a virtual organization. The ONE software is Open Source and available on SourceForge<sup>22</sup>.

During the meeting a CREATE-NET expert<sup>23</sup> presented the main points of the service. ONE is a P2P-based web service that facilitates the negotiations between two entities: the owner and the participant. Through the service it is possible to model two elements: the objects of the negotiations and the processes. The exchange of complex information is

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21 <http://one-project.eu/site/modules/content/?id=1>

22 <http://sourceforge.net/projects/one-project/>

23 CREATE-NET is the ONE project coordinator.

then organized in a simplified way and through a prized<sup>24</sup> identity and trust model. There is a distributed engine for the negotiation and both the owner and the participants may use their own machines.

The main outcome of the meeting is that the IMs appreciated the idea and understood the ONE platform “as a way to generate the tripole in a semi-autonomous way”. This expression responds to a functional requirement that InfoTn introduced in the call for project of the TasLab portal. The “tripole” (see Chapter 4 introduction and 4.3.1) is a model to connect local PA, enterprises and research centers in a regional innovation system. Actually the two IMs are studying the ONE service and in the future we will try to decide if and how the service will be part of TasLab.

### 4.3 The early activities and decisions

CREATE-NET spent most of the time between October 2008 and April 2009 by facilitating the emergence of those issues that the FSE formal project hides and sustaining the DE principles when defining the organizational model and the technology in support of TasLab. Since we are not the project coordinator and InfoTn is directly interested in some particular shapes of TasLab, while there is not agreement between the other regional stakeholders, the attempt to emerge a series of core infos has been very difficult.

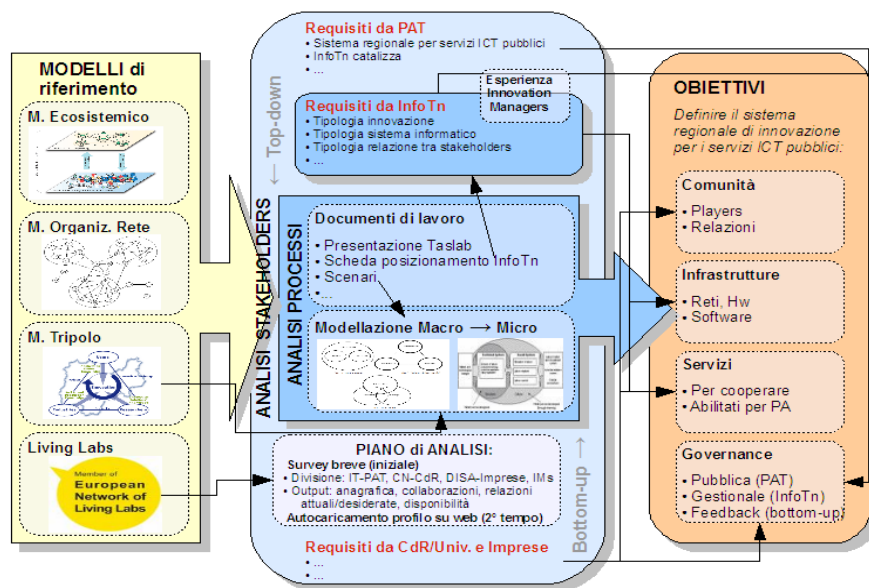


Figure 21: a CREATE-NET attempt to order the research strategy in TasLab.

Figure 21 represents one of the attempts done by CREATE-NET in order to identify and share a research strategy that contains all the needed elements<sup>25</sup>:

- *Reference models*: ecosystems, networked organization, tripole, Living Labs;
- *Stakeholders analysis*: PAT, InfoTn, Innovation Managers, ICT Research Centers and University departments, ICT enterprises

<sup>24</sup> <http://www.iaria.org/conferences2007/AwardsSECURWARE07.html>

<sup>25</sup> Not only the elements of interest for InfoTn.

- *Processes analysis*: macro and micro organizational model;
- Objective: define the regional innovation system by identifying Communities, Infrastructures, Services and Governances<sup>26</sup>

In the following sections we will briefly explain the early definition of the regional innovation system, the emergence of InfoTn role and interests, the core stakeholders survey plan, and the early organizational model draft.

### 4.3.1 The early definition of the regional innovation system

The first issue we suggested to clarify is the composition and relationships of the regional innovation system as actually is. Figure 22 constitutes one of the outcomes of a project meeting and refers to a situation where InfoTn is directly in charge of all the ICT services and products for the local PA. It represents the stakeholders of the innovation system divided in three circles:

- PA: local PA, European Commission, partially the controlled agencies InfoTn and Trentino Sviluppo (in charge of the business development), and the European Center for Innovation in Trentino (CEII);
- Enterprises: local ICT enterprises, the enterprises association, and partially CEII, Trentino Sviluppo and InfoTn;
- Research Centers and University

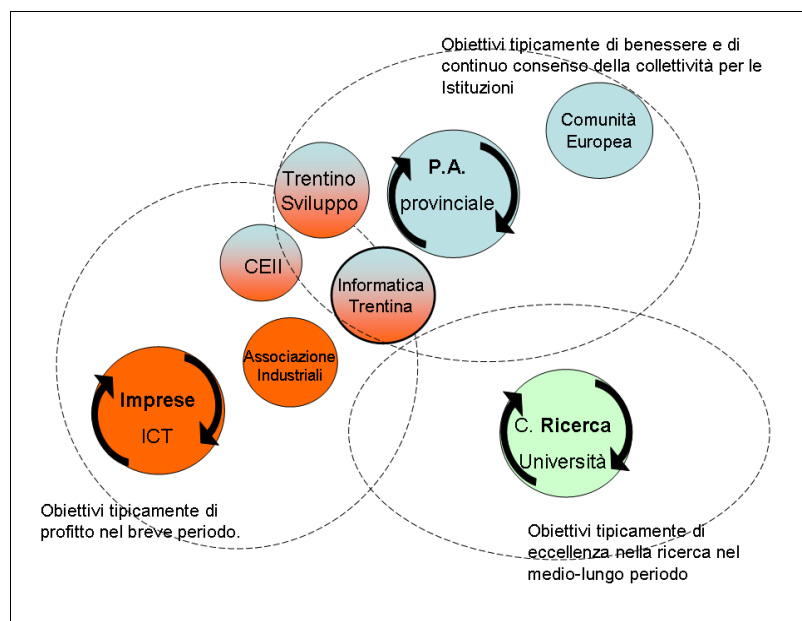


Figure 22: the stakeholders of the Trentino innovation system.

One of the models for shaping the innovation system is the “Tripole” or “Triple Helix model” (see Figure 4; Etkowitz and Leydesdorff, 2000). This very abstract and macro model suggest that Local Government and regional development officials can push

<sup>26</sup> InfoTn appreciated the CISG model that has been developed in the OPAALS D7.1 (Botto and Passani, 2008)

technology development by engineering the process that will take technology to commercialization in a top-down fashion. The model is very common in the Scandinavian countries. Recently the model has been criticised in favour of a “Double Helix” model that underlines the roles of the innovators – that disappears in the previous one – and the enterprises (Brännback et. al., 2008).

We suggested to start considering the future innovation system by introducing the innovators and stop hiding the role of InfoTn, since in the “Trentino-tripole” images InfoTn did not appear. A very early Trentino tripole emerged when the InfoTn colleagues started drawing their institution in a schema (Figure 23).

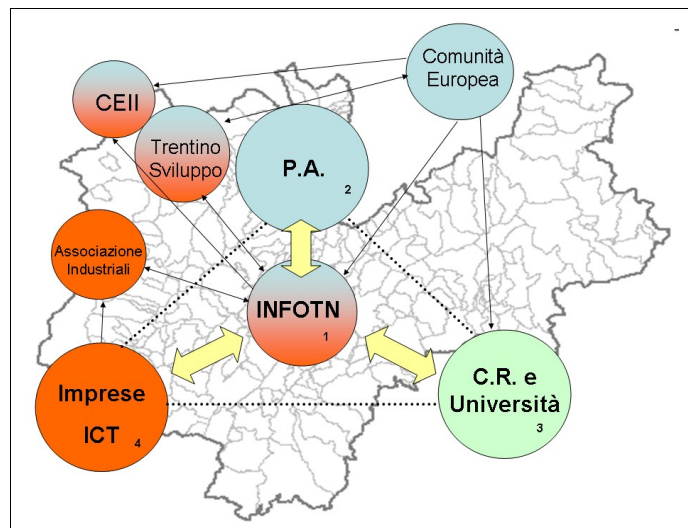


Figure 23: The early Trentino Tripole of innovation

#### 4.3.2 Facilitating the emergence of InfoTn role and interests

We were aware of the relevance of the project for InfoTn: as explained in Chapter 2.1.2, the FSE project innovates its business plan. Formally TasLab is a joint initiative of the PAT, InfoTn and many research centers and enterprises. In the previous section we discussed the need to emerge the role of InfoTn in the project: the coordinator of the FSE project and the future facilitator of the innovation system. We continued doubting on the declarations of InfoTn about: their willingness to be a neutral intermediary, their openness to any organizational form and technological tool for TasLab. InfoTn is a business organization, therefore it is focused on its own business. The difficulties we found in meetings with the PAT key person for this innovation – remember that InfoTn is an agency publicly controlled –, and the fact that InfoTn is hardly criticized by every local PA in Trentino, reinforced the doubts.

InfoTn continued being vague about their interests and strategy. For the DISA colleagues and us it was hard to work on a future innovation system with such a lack of trust on who is the project coordinator and the agency that will facilitate the future innovations. We realized that this situation will create tensions during the interviews with the local stakeholders. Therefore CREATE-NET decided to facilitate the emergence of the role of InfoTn in the innovation system by forcing the discussion on their strategic interest.



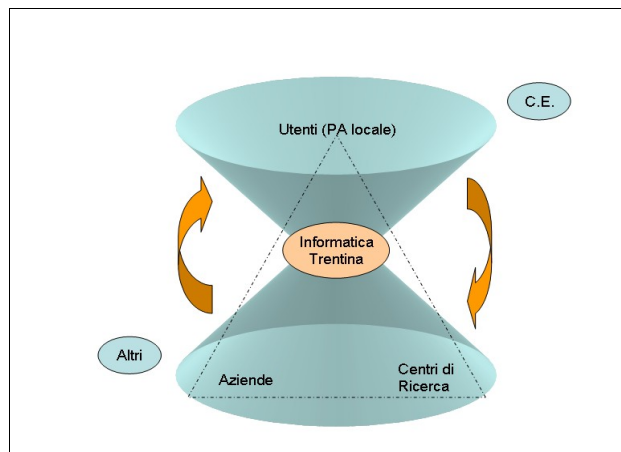


Figure 24: The strategic position of InfoTn in the tripole of innovation.

Therefore we produced an image of the future innovation system (Figure 24). It is alternative to the tripole of innovation (Figure 4, pg. 10), where InfoTn is simply hidden, that they tried to use in a presentation to explain the future regional system. It is also alternative to the Trentino tripole of innovation (Figure 23), where they described their role as the “facilitator”, that we pushed to draw in order to include them in the tripole. This image describes InfoTn in the strategic role of the “obligatory passage point”.

This position is considered to be powerful in sociology (Callon, 1986), because of the possibility to manage the exchanges between agencies and influence the system by forcing ideas, standards, micro-decisions, and so on. We simply generated this image to clarify that this is what actually we and everyone knows about InfoTn and TasLab. We therefore suggested them to start working for more trusted relationships with us and with the local stakeholders. Then we all – InfoTn, DISA and CREATE-NET – generated a draft view of the processes of innovation in TasLab where InfoTn highlights as the central agency (Figure 25):

1. *Initiation*: the first idea can steam from any stakeholder;
2. *Involvement of InfoTn*: an Innovation Manager will evaluate and start facilitate;
3. *Circulation*: the cooperative work will generate the services and/or products;
4. *Return to the user*: the IM moves the innovation to the PA;
5. *Continuation*: the innovation will be monitored and improved.

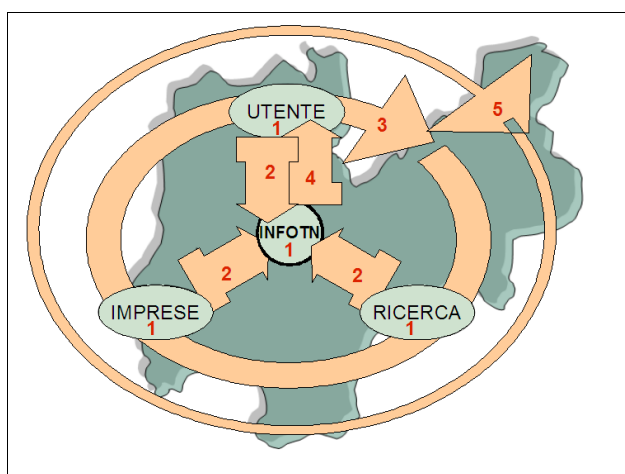


Figure 25: The strategic role of InfoTn in the processes of innovations.

### 4.3.3 The survey plan and practice

As exemplified in Figure 21, in January 2009 we started organizing the survey of the relevant stakeholders. Originally, in order to validate the core ideas and governance framework with the local decision makers, we planned to meet the decision makers first:

1. *PAT*: the responsible of the Organization and Informatics Services, who is the one that should address InfoTn to the right direction;
2. *InfoTn*: about ten Innovation Managers are actually working in InfoTn waiting to enter the TasLab;
3. *Research centers and enterprises*: about ten research centers and twenty enterprises.

InfoTn was in charge for contacting the PAT key person, the meeting was delayed for a certain number of times, then they communicated us that it will be very difficult to organize this meeting. This news sounded us like the customer is not aware or dislikes the project, therefore we asked InfoTn to be very clear with us about the concrete relationships with the PAT. The answer was:

“... actually the 'constraints' between InfoTn and PAT are not clear. There is a business plan that has been approved in the 2008 from the past Regional Government, then we faced the elections and the government is changed. The PAT President at the moment is maintaining the Innovation Aldermanship in his hands and the decisions are not taken.” (The InfoTn TasLab Project Manager, 3 March 2009)

This means that we started negotiating for a meeting with the customer of the future innovation - who should want TasLab and controls InfoTn – at the beginning of January, and that at the beginning of March we have been informed that “the decisions are not taken” on the project. In the middle of May 2009 we have been informed that:

“It is a new and confidential information that the PAT President decided to create a Board (CDI – Comitato di Indirizzo) for the research and innovation in ICT. It will be composed by some key persons of PAT and the presidents/directors of the main research centers in the Provence. Its role will be to address the ICT innovations, therefore it will finally validate the ideas and the work done.” (The InfoTn TasLab PM's area head, 14 May 2009)

We understood that:

1. the PAT President started considering the TasLab only after a workshop organized the 14<sup>th</sup> of April by an agency of the National Research Council (CNR), asking to work on a better local innovation system in order to increase the local agencies possibilities;
2. the PAT key-person for the TasLab will be part of this board and, for some reasons, he can not force his own direction on TasLab;
3. the research centers that are partners of TasLab found a way to enter the discourse before we started interviewing them.

When waiting for a meeting with PAT we started organizing and meeting the TasLab IMs and we will meet the research centers and enterprises later. A set of new pieces of information emerged at this point:

- a) ten IMs have been selected by the PAT key-person and the DISI director in the last



3 years,

- b) then they have been employed by InfoTn with funds coming from the PAT,
- c) they focus on specific issues like eGovernment or eMobility and maintain the relationship with specific PAT officers, and
- d) five of them actually work as PMs in InfoTn, four in the PAT key person's office, and one is the director of the local Laboratory on Interoperability and eGovernment (LEGO - Laboratorio di Interoperabilità ed e-Government).

The division of the IMs between the PAT key person and InfoTn reinforced our understanding that the relationships between the two institutions are not clear. The early interviews to four IMs (side InfoTn) strengthened the impression that InfoTn is not the place where the TasLab could be organized. In general the IMs are suffering for the bureaucracy and the slowness of the organizational procedures in InfoTn. It results that they can not perform the flexible and fast activity of territorial facilitation and project management activity that was required them during the selection. We are actually planning to interview the other six IMs

#### **4.3.4 Conclusion: the early organizational model**

On the 17th of April CREATE-NET and DISA decided that a first early macro organizational model for TasLab could be drawn. Its very first image is reported in Figure 26. First of all the TasLab should not depend directly from InfoTn because this institution does not allow three core issues for the broker of the future regional innovation system:

- independence: TasLab should not depend directly on any local stakeholder, in order to ensure his neutrality;
- flexibility: TasLab needs to be organized on a fast decision making and working procedures, in order to catch in time the innovation possibilities and concretely catalyse the processes;
- evaluability: the work done by TasLab should be evaluated by the local stakeholders in order to improve its service.

The TasLab should be organizationally divided in two parts: the Innovation Managers (IMs) and the Innovation Manager Service (IMS). The IMs will work as the business mediator of the local innovation. They should know the territory and maintain the relationships with the decision makers, the researchers and the enterprises on their specific subjects. They will maintain also national and international relationships and maintain the contact with the Venture Capitalists and other funding institutions. The IMS will support the bureaucratic and administrative procedures of the TasLab. It is the executive component for the strategic part of the network.

Then the TasLab should be well connected with the local stakeholders. The IMs maintain the individual relationships with members of PAT, InfoTn, research centers, enterprises, venture capitalists, and everyone who is relevant for their subject locally and globally. The IMS will maintain the institutional relationships with PAT, research centers and enterprises. For this extent a Task Force composed by PAT and research centers representatives will

work as decision maker on issues like organizational asset of TasLab, definition of the evaluation system, definition of the incentives system.

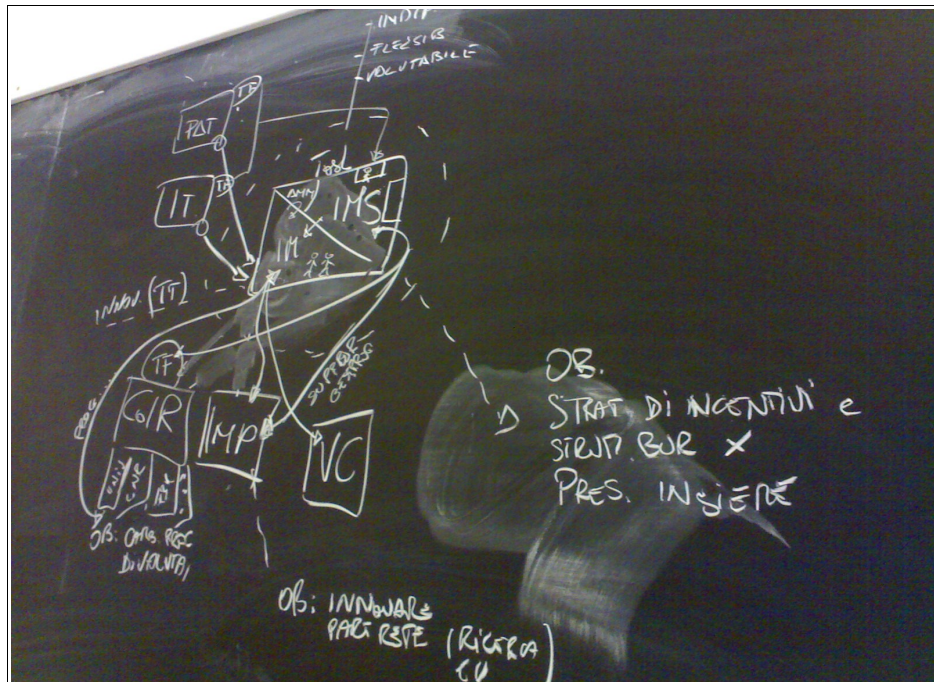


Figure 26: The first draw of the early organizational model for TasLab.

The TasLab working team is actually moving through a validation and improvement of the organizational model by meeting the stakeholders and facilitating shared political decisions. The incentives model that is being suggested by the team is based on the fact that, if TasLab will work well, it will consist in an excellent new market for research centers and enterprises. We contrast the idea that they will need to be incentivized: they will somehow pay for this service and participate for the TasLab costs. This will be consonant with: (a) a concrete participation of those agencies, (b) an extremely low cost and flexible organization, since the stakeholders would not lose money in vain, and (c) a continuous monitoring and evaluating activity on the TasLab activities.

## 5. Summary

### ***5.1 The strategy for the Trentino DCE and CREATE-NET involvement***

With this deliverable we presented the state of the art of the activities regarding the Trentino Digital Community Ecosystems (DCE) living laboratory at the beginning of June 2009. The report provides an image of the strategies, the projects, the activities and the challenges that will generate the new future regional innovation system in Trentino and that will hopefully consider also Digital Ecosystems models and services. The role of CREATE-NET in those activities is the one of the local stakeholder who works constantly as a consulting and research agency – telecommunications, services and local development competences – with:

- the local government of the Autonomous Province of Trento (PAT);
- the two public Joint Stock Companies that manage the public ICT services (Informatica Trentina – InfoTn) and the public broadband infrastructures (Trentino Network – TreNet) in the Province;
- the local research centers, community agencies, ISPs and ICT sector companies.

Because of the direct involvement and interest of CREATE-NET in the reported activities and the attempt to create the maximum degree of participation and involvement of the interested agencies in the activities, the methodological framework of the research is Action Research and Participatory Design. More precisely, CREATE-NET “action” in this research is the specific research and consulting activity (telecommunication devices, services creation, process consultancy, ...) that constitutes the meeting point between the CREATE-NET interests and the community demand. Differently “research” is the monitoring of the activities regarding the development of the regional innovation system in general, and of the possibility to introduce DE models practices and technologies in particular.

The growing DCE in Trentino is connected to different local actions and projects. Basically there is an Information Society regional plan (PAT, 2004) and the understanding that if the local research sector is one of the best in Europe, the private ICT sector is fragmented, therefore it lacks of competences and is unable to create innovation. Second, the PAT is actually performing two actions in order to sustain the regional ICT innovation: (1) the separation between InfoTn, the controlled agency that manages the ICT services for the public sector, and TreNet that will manage the public telecom infrastructures; and (2) the forced<sup>27</sup> decision to change the role of InfoTn from the monopolist in ICT services for the local PA to the mediator between the PA ICT-needs and the enterprises.

In this situation CREATE-NET defined a different DE introduction strategy by avoiding to focus only on a enterprise cluster or social network and:

1. starting from concrete community needs,
2. both on the community network and the advanced services (also DE) sides,

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<sup>27</sup> “Forced” because of a National Law forbids to publicly owned/controlled companies to compete with the other enterprises on the PA services market.

3. considering the ongoing actions and projects on the territory, and
4. working on the many levels (Local Government, services and infrastructures managing agencies, research centers, enterprises, associations and grassroots level) in order to create or facilitate locally meaningful innovations with the possibility to introduce DEs.

As research center considered by the Local Government in the development of the regional information society, we identified three levels involvement/action that could facilitate the Trentino DCE:

- I. the top-down regional definition of broadband infrastructures and related policies;
- II. the intermediate level composed by projects relating the new regional innovation system and installation of the DE in Trentino;
- III. the bottom-up level composed by projects directly involving specific communities and communities needs, with the aim to create a virtuous circle with the first two levels.

The CREATE-NET involvement is increasingly with the bottom-up level. We collected data by participating as technology consultants in the planning of the T.Net regional broadband project. Later at the beginning of 2009 we interviewed the director of the PAT IT department, the director of the regional Health IT department, and the directors of the two publicly controlled enterprises Informatica Trentina and Trentino Network. In the second level we are participating as facilitators and DE experts in the TasLab project, which will generate the new regional innovation system. Again in the second level actions (Genio e Regolatezza project) and in the third level ones (COLOS, Fiemme Wireless, and Parc-Fi projects) CREATE-NET is facilitating the grassroots' innovation with process and technological consulting under an Action Research methodology umbrella.

## **5.2 The bottom-up projects experience – at June 2009**

We think that the facilitation of local sensemaking process in a participated process of development could play a pivotal role for a future DCE. Nevertheless, working on the bottom-up projects is energy consuming and potentially frustrating. In fact the friction between the social and the technical dimensions of innovations is well known as an hard issue to be managed. It is clear that working with people with an unclear understanding of the needs and motivations is harder than producing a pure technology tool in a laboratory.

Actually, the four bottom-up projects we discussed are variously in a limbo between the general disinterest of the key stakeholders, the research of funding, and the possible recomposition in new specific projects or clusters of projects. In every project we started from an expressed local need:

- *G&R*: InfoTn wanted to reinforce the acquisition procedures for products and the collaboration within the local ICT SMEs scattered sector;
- *COLOS*: a group of small municipalities wanted to better manage the ICT internally by creating an inter-municipalities office;
- *Parc-Fi*: a local ISP wanted to create a service for the connectivity sharing between the public broadband network customers in Trentino;
- *Fiemme Wireless*: the local Fiemme valley institutions wanted to improve the

telecommunications and services for the 2013 Nordic Ski World Cup.

CREATE-NET initiated the construction of cooperative project plans with the aim to facilitate the DCE development. This means that we sustained both the broadband development and the emergence of more or less advanced services on it, with the idea to create a virtuous circle of innovation in deep participation with the local stakeholders. Specifically, the relationship of the four projects ideas with the DE and DCE is the following:

- *G&R*: create a local ICT sector SMEs Digital Ecosystem;
- *COLOS*: facilitate future advanced services for small Municipalities groups and open a new market for the local ICT SMEs sector;
- *Parc-Fi*: it is the construction of an advanced connectivity service that corresponds to the Type 4 of Community Networks described in Deliverable 7.1;
- *Fiemme Wireless*: in terms of CNs, it is a wireless Mesh extension of the local area connectivity, in terms of DEs it is the starting point to develop advanced services for the local tourist sector.

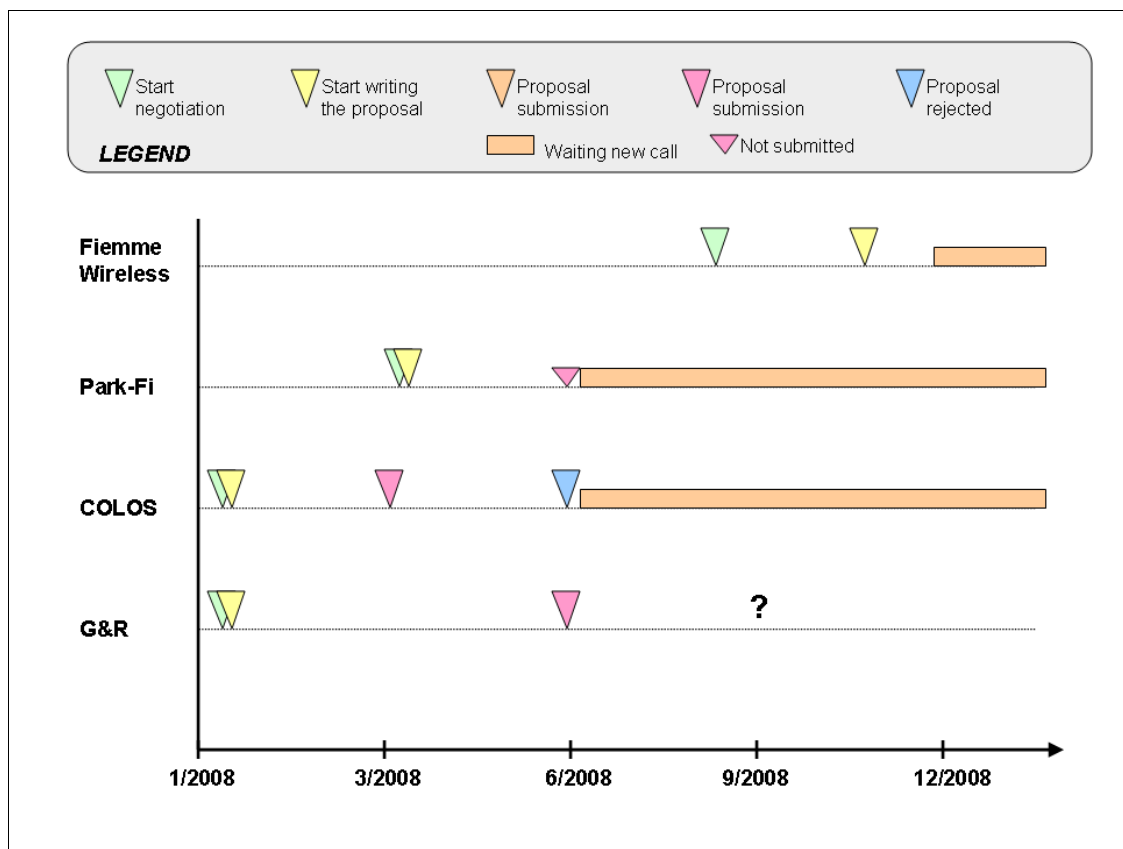


Figure 27: The Trentino DCE bottom-up projects timelines in 2008

The projects timelines are summarized in Figure 27. Summrizing the problems we faced, we can say that:

1. **ENTER BAD PROCESSES**: when using the strategy to enter a local project under negotiation phase in order to inflate DE ideas and services, the first risk is to be involved in a low quality and unsuccessful local relationship and innovation (see the G&R project);

2. LOCAL PARTNERS PARTICIPATION: it takes time to concretely involve and test the real interest and motivation of the local partners. Usually there is a gap between the political/managerial statements of managers and the real interest that influences the partners participation;
3. LACK OF POLICIES: also the absence of a concrete settlement of policies by the Local Government, that could happen for several reasons (see next Chapter), negatively influences the development of bottom-up projects.

## **5.3 Conclusions**

To become a concrete action, the future creation of a ICT SMEs Digital Ecosystem will require an higher involvement of local partners. We will continue suggesting it by working more on specific services (like the Open Negotiation Environment) rather than the generic DE creation. This is the main lesson learned from the Genio & Regolatezza project.

We consider relevant working locally both on the broadband communication technologies and on services. This because working on CNs opens possibilities of discussion about services with the local grassroots partners. About the relation with the Local Government, CREATE-NET will continue to introduce suggestions of services by using the accreditation as broadband technology research center.

The three main grassroots projects (COLOS, Parc-Fi, Fiemme Wireless) are actually waiting for local policies and project calls. Apart of the problems of participation of the local actors, the lack of involvement of the Local Government is creating here dramatic effects:

- COLOS is suffering for the lack of concrete local policies on eGovernment and Open Source innovation in the PA. We are waiting for a decision about the willingness of a pilot action to overcome the small municipalities problems relating the ICTs.
- Parc-Fi was suggested by the PAT to be re-directed to a FESR call, but the Local Government is late in setting this call;
- Fiemme Wireless is waiting for the direct interessment of the Local Government. The project will probably become a vision to generate a cluster of more specific actions.

It should be clarified that the lack of concrete policies and governance directions is only partially endemic in the PAT. It is true and well known from everyone in Trentino that the PAT Local Government style, that is reinforced by the particular autonomy of the region, is that to control every grassroots action and tend to become the intermediary/co-financer of every innovation. This creates a grassroots and enterprise culture of relaying upon the Local Government that, excluding some rare excellence cases, is blocking the socio-economic tissue. This cultural problem is evident in every participated negotiation for a project: local partners avoid investing even small amounts of resources and prefer to wait for the public intervention, even if a fast start of the action will generate fast return of investment.

The additional problem we faced in the early 2008, and that is continuing actually, is that the Local Government elections (May 2008) frozen every policy decision on local innovation. After the elections the Innovation Assessorship of the PAT remained without a

management for many months and the whole public service stopped. It has been very difficult to have idea of projects, funds and interests from the public authorities. Also the experience of the TasLab – at June 2009 – is suffering for the absence of clear policies. Therefore we trust (1) on the chance to re-start the bottom-up projects; (2) on the possibility to generate more grassroots actions proposal in the future; and (3) to deliver a more composite state of the art of the Trentino DCE projects in the future report.



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