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CONTRIBUTION OF LIVING LABS FOR TERRITORIAL DEVELOPMENT AND INNOVATION

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Author’s declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

Author:

(date) (signature)

Abstract

The transition towards a service economy from product based economy has begun already where changing demographics, urbanization and globalization are transforming different aspects of our lives and digital services highlighted than ever. Services require more innovation and transition of the business area should address the future growth in the service sector.

From this study, it is evident that internet based services are becoming more and more important in the regional development and their sustainability for example in Italy where living lab concepts had encouraged innovative solutions that support various industry especially health, inclusion, business and environment. This also raises questions on how urban areas can evolve towards the more sustainable user-driven environment.

Living Lab which is a rather immature concept, and can be considered as an emerging principal driver in the design and management of new and innovative concept of territorial governance and development policy. Living Lab approach is driven by concepts like co-creation, knowledge sharing, experimenting in the real open environment.

A case study approach was used to explore how living lab concepts have been used for territorial development in Trento Italy, the findings reveal that collaboration, co-creation have been fruitful in this territory. However incentives are needed to encourage stakeholders' participation. Beneficial Innovations of various types had also been leveraged upon by the remote areas of Trento to attract international funding to support her regional development.

To conclude, this thesis contributes to the understanding of what is a Living Lab, how living labs could benefit for territorial development and to the importance of user involvement processes in the innovation of services design at territorial level.

The thesis is written in English and contains 58 pages, 7 chapters and 9 figures.

List of abbreviations and terms

ENOLL	European Network of Living Lab
FBK	Fondazione Bruno Kessler
GDP	Gross Domestic Product
ICT	Information Communication Technology
JPI	Joint Program Action
LL	Living Lab
MIPR	Intellectual Property Management
PAT	Autonomous Provence of Trento
PPPP	Public Private People Partnership
RIS3	Research and Innovation Smart Specialization Strategy
TasLab	Trentino as a Lab
ULL	Urban Living Lab

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CHAPTER 1: Introduction

1.1 Research Background

The shift has begun already from product based economy to service economy; digital services are highlighted than ever. Services require more innovation and transition of the business area should address the future growth in service sector. But the majority of the e –government programs and its' e-services around the world, these initiatives have often been developed only from the perspective of public organizations.

This research will focus on a new research area, Living Lab which is rather an immature concept and there are many aspects that need to be studied and further explored to understand the phenomena in depth; hence, more insights into how Living Lab activities and contexts can be supported are needed. The Living Lab concepts and methodologies seem to be gaining recognition in the research community, especially in the Europe. This is due to the growing number of active Living Labs across Europe (ENoLLL, 2015). It is considered as a new dimension to deal with innovation and to get insight into the innovation process. The literature on Living Lab has grown within the last decade with experimentation conducted throughout the world, but still the empirical research is still scarce, so the further investigation is needed (Schuurman, et al., 2015).

This chapter highlights the importance of living labs as an emerging research area. It briefly couples living labs to ongoing parallel changes in the socio-economic environment and technological opportunities in embedded contexts. Parallel with such changes and opportunities, there is an ongoing paradigm change that is opening up innovation. Next, the chapter guides the reader through the objective and the research questions of this study. It concludes with delimitations and by briefly outlining the structure of this dissertation.

1.2 Motivation

Living Lab (LL) research is emerging as a potentially important stream in innovation research. The literature found has mainly been concerned with issues such as defining Living Labs and explaining how Living Lab supports the innovation process (Ståhlbrös & Holst, 2012). This research would go farther to investigate Living Lab and associated projects that have been active.

While expecting to explore and study how effectively involve users in the Living Lab scenario, outcomes of the activities and how it could operate in a territorial and regional context while to understand how to integrate concurrent research activities and innovation processes within a citizen-public-private partnership (C3P).

Currently, there are over 300 Living Labs (ENoLLL, 2015), and the network is continuously growing. The LLs are operating everywhere around the world, but mainly they are active in Europe than elsewhere (ENoLLL, 2015). The figure below represents how Living Labs spread throughout the world. The aims of the research as mentioned above are to investigate how Living Labs are organized and managed at the European level, how they work as co-production/creation tools towards the development of the particular region. Furthermore, these concepts also could answer public financing and complex problems, such as environmental pollutions, aging, energy and unemployment issues by the participation of citizens (Nesti, 2015) in the provision of public services.

1.3 Research Objectives and Questions

This research will focus on how Urban Living Lab concepts are contributing to territorial development and innovation. The central research question of this master thesis is the following: How urban living labs contribute to territorial development and Innovation of services?

To facilitate answering the primary research question as above, several secondary research questions have been formulated as follows:

1. How are Living Labs organized and in which are their domains of interests?
2. How do Living Labs operate in Territorial level?
3. How to involve citizens during processes of research and innovation?

Above mentioned secondary questions are investigated and answered in 3rd and 5th chapters concerning the existing domain of studies. Academic literature, articles available and case study help to achieve the goal of this thesis and to conclude findings from empirical data analysis.

To fulfill these aims of the research, I will carry out an empirical study and discuss the case of Autonomous region of Trentino. The said case study is an example of territorial innovation

focusing in the domain of eGovernment where the creation of new ICT services, products, and social infrastructures is enhanced by user-driven, open innovation (Informatica Trentina , 2016) principles and practices.

LL can be considered as an emerging principal driver in the design and management of new and innovative concept of territorial governance and development policy (Shvaiko, et al., 2010). Trento is although relatively new to this arena it offers the advantage of being able to learn from what has worked – and what hasn't elsewhere. The study has used the data available on the ENoLL website, a reference point for the LL community operating at the international and particularly at the EU level.

1.4 Overview of the Living Lab

Living Lab model is a concept which focuses on knowledge sharing, collaboration, innovation and experimentation in a real world environment. It is a new dimension on dealing with community-driven innovation in real life contexts (Schaffers, et al., 2011). Living Lab is neither a traditional research lab nor a "testbed" (Pallot M.,2009), but rather an "innovation platform" that brings together and engage all stakeholders such as end-users, academia, policy makers, and so on at the earlier stage of the innovation process.

European Network of Living Labs (Eskelinen, et al., n.d.2015, p.12) define living labs as: "user-driven innovation environments where users and producers co-create innovation in a trusted, open ecosystem that enables business and societal innovation." This definition provides a concrete representation and concrete implementation of the concept of open innovation.

Increasing the business value of R&D is one of the important objectives of the Lisbon Agenda, and Living Labs approaches help achieve this goal through creating open innovation environments (Schaffers et al. 2009) and empowering end-users to engage in product and service development in real-life context. Understanding users or customers and the data related to them identified as important for organizations and companies. We can see that companies use traditional marketing surveys to learn about users and customers, but today "learning is shifting towards congregating customer data by integrating users in the innovation process as co-producers" (Leminen, 2015, p.5). With recent shift to the information age, growing number of practitioners and businesses are looking newer ways and techniques to adapt traditional innovation models to harness the benefits

of the open innovation model and methods. This importance could lead to increased interest in living lab concepts at the businesses and governmental level (Eschenbächer, et al., 2010).

The literature on LL methodology has grown impressively (Figure 1), empirical research on the impacts of LL on territorial development and innovation of internet enables services is still scarce. Further, the idea of co-production need to be further investigated centered on the LLs which has characteristics that drive transformation in the traditional ways of co-production (Nest G 2015).

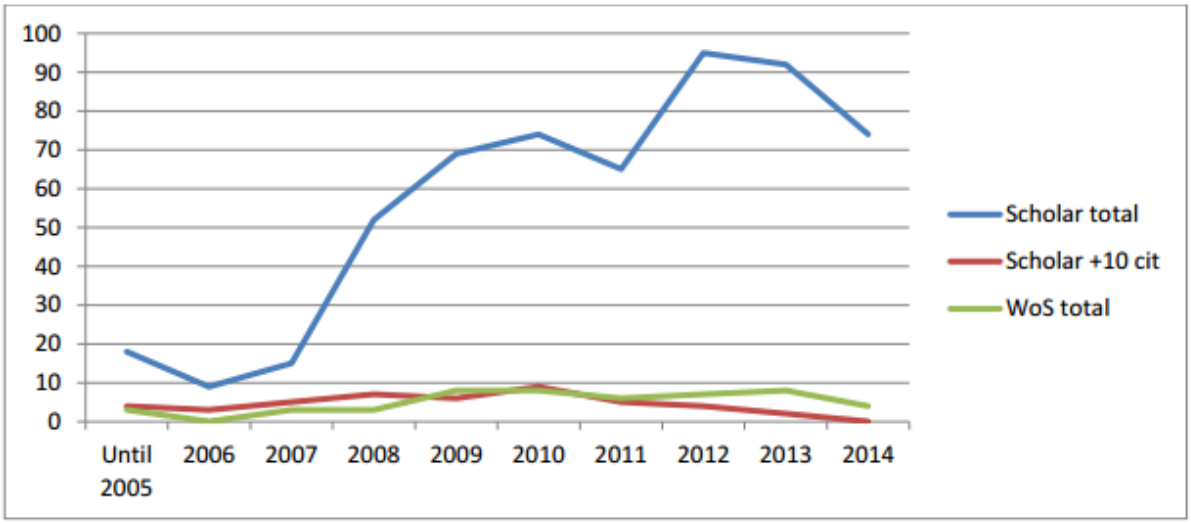

Figure 1. Living Labs papers evolution (Schuurman, et al., 2015)

The term Living Lab was used for the first time in the 20th century by Professor William Mitchell from MIT and he is said to be the founder of Living Labs. According to his research, "hidden needs can be discovered, prototypes built and the evaluation and enhancement of multidimensional solutions done with the help of user-centric research methods in a real-life living environment" (Rönkä, Orava, Niitamo & Mikkelä 2007, 19).

The Living Lab movement spread from the USA to Europe, and also to other countries in Asia such as China, Taiwan, and South Korea. As it spread outside the USA, Living Lab begins to discover new domains and took different shapes where it could be applied. It has expanded to district areas and city planning to eGovernance, and in Europe, LL became the alternative to the testbed concept (Rönkä, Orava, Niitamo & Mikkelä 2007)

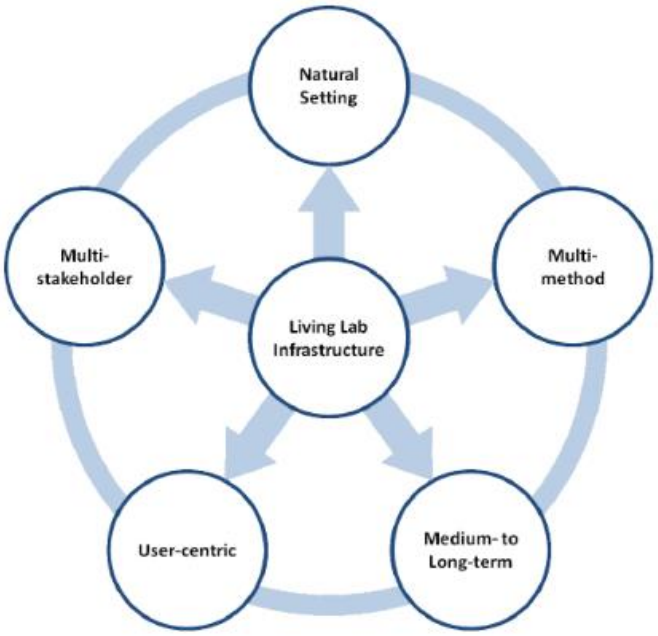

Figure 2. Elements of Living Lab (Schuurman, et al., 2013)

Even though the field of living labs is still in its early stages, there is an increasing development towards more accepted and developed form of open innovation. This motivates and increases the interest in studying living labs a mechanism for innovation at territorial level.

European Network of Living Labs (ENoLL) which is the legal representative of the network established as a result of the European Living Labs movement in 2006 (ENoLLL, 2015). After the initiation, same year European Commission officially declared its support to the movement and to promote a common European innovation system based on Living Labs (Dutilleul et al., 2010). ENoLL's main objectives were to connect the living labs for knowledge exchange, network among EU living lab projects and to share and develop innovation (European Commission, 2013b).

Nonetheless, in terms of conceptualization, the current literature on the Living Lab concepts is still inconsistent and sometimes contradictory even though there have been various Living Lab projects since the establishment of European Network of Living Labs (ENoLL).

Conceptually the living lab as a field of study mostly related with the innovation theories and concepts such as user innovation and open innovation (Schaffers, et al., 2011). This could also be identified as a part of smart city approach. The European Network of Living Labs (ENoLL) is an institution that involves in the formalizing network among living lab around the globe and more

specifically in Europe. Per ENoLL there are five essential characteristics in a Living Lab (Ruijsink, 2016);

1) active user involvement;

2) co-creation;

3) multi-stakeholder participation;

4) a multi-method approach and

5) real-life setting;

These requirements are not always mandatory, but in practice, an LL should be put a strong emphasis on the digitalization and data. ENoLL aims to ‘’support co-creative, human-centric and user-driven research, development and innovation to better cater for people’s needs’’ (Ruijsink, 2016). ENoLL is an international non-profit organization, situated in Brussels (European Network of Living Labs (ENoLL), 2016).

Today ENoLL network has over 170 active living labs worldwide, within this, there are 20 EU member states (Ruijsink, 2016) actively work with the Institute (Figure 2). In addition to that ENoLL represent in all the five continents (European Network of Living Labs (ENoLL), 2016). ENoLL has contributed in the innovation, with ICT and collaborative experimentation. The ENoLL continue to maintain strategic partnerships between institutions including the World Bank and EBN, the European BIC (Business & Innovation Centre) Network (Ruijsink, 2016). ENoLL primarily focused on innovation (ENoLLL, 2015) and this can be best seeing how Living Labs developed as ‘’small local ecosystem’’ (Ruijsink, 2016). In this study, we took a closer look at the Trentino as a Lab (Trento, Italy).

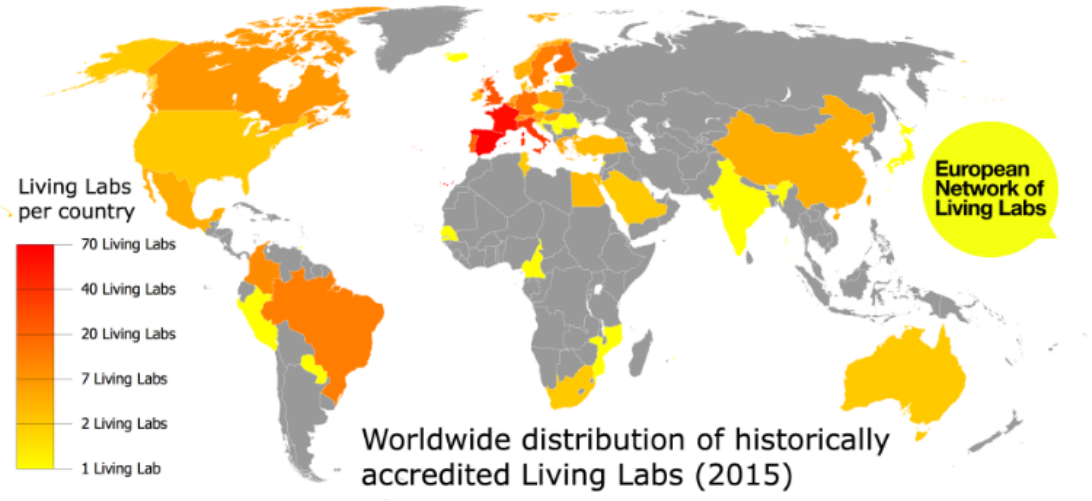

Figure 3: Worldwide distribution of historically accredited Living Labs (ENoLLL, 2015)

As discussed above, the contribution of the living labs towards territorial development needs to be further understood. The aim of this thesis is, therefore, to give an overview of Living Labs with a sustainability focus and their characteristics to enhance the knowledge within the field. Furthermore, this study is to investigate how Living Labs contribute to transitions towards more sustainable cities. As mentioned earlier the Living Lab concept focuses on creating shared arena based on its core concepts; such as knowledge sharing, the creation of digital services, processes, and develop ideas and tested with users. This is an iterative model of stakeholder co-design to achieve social innovation through ICT (ENoLLL, 2015) .Said components of LL could be directly and indirectly connected to e-government domain and its' solutions, especially fall under the e-Democracy and e-Participation (Reddick, 2012) toolboxes.

1.5 Scope

The scope of the study is limited to Living Lab experience that potentially could contribute to territorial development either directly or indirectly. Furthermore, the geographic scope of the main case is limited to Trento, an autonomous region in Italy. Furthermore investigation of the region's livings lab initiative carried out focusing on their effort on sustainable development of urban areas and innovation of services territorial innovation focusing on the domain of eGovernment where the creation of new ICT services, products, and social infrastructures enhanced by user-driven, open innovation principles and practices.

1.6 Thesis Structure

This thesis is organized into six chapters.

Chapter 1, the ‘Introduction,' presents the thesis research outlining the objective of the study, the deliverables, relevance, and contribution.

Chapter 2, the ‘Theoretical Concepts,' reviews the related theoretical concepts of the research.

Chapter 3, the ‘Literature Review,' examines the pertinent academic research papers previously conducted in this space by which, the generated lessons learned is used to construct the initial guidelines to conduct the research.

Chapter 4, the ‘Trentino Living Lab – Case Study,' discuss and study the case of living lab projects in the region if Trentino.

Chapter 5, the ‘Methodology,' details the research approach of empirically analyzing the case study data.

Chapter 6, the ‘Empirical Data Analysis, describes the reviewed living labs, their key attributes and the innovation patterns derived from the insights.

Chapter 7, the ‘Discussion and Conclusion,' reviews the research results in comparison to established theory. Identify the limitations of the research, opportunities for future research and closing thoughts.

1.7 Relevance and Contribution

Academics and research organizations will find this research relevant because it extends the knowledge on living labs by establishing a set of attributes that can help standardize how living lab concepts are viewed (cf. Mulder, 2012) through the analysis of the case study discussed in chapter two. Practitioners are demanding models that include effective ways to guide shared innovation environment (Guzman et al., 2013). This study sets a starting point for future research. This research is also relevant to personals in local (territorial) governments who seek to develop and launch innovative technologies and related services successfully. While much is now known about the value innovative users bring (von Hippel, 2003) and that living labs are the optimal way of producing and commercializing innovation (Liedtke, 2012), there is little guidance as to what is involved in and what could a Living Lab bring to the territorial development. Likewise, this

research will help policymakers and their associated communities to understand living labs; alleviate the co-operation and trust issues that are required for the successful operations. (Barcenilla & Tijus, 2012; Bonaccorsi & Rossi, 2003).

This research makes an academic contribution to the field of living labs by describing its role in the territorial context. It adds a list of constructs: objectives, governance, philosophy, stakeholder, advantages, communication, and methodology, which help with the understanding of living labs from multiple perspectives.

CHAPTER 2: Theoretical Background

2.1 Living Labs in Urban Context

Living Lab is a research concept usually operate in territorial contexts (e.g., cities, agglomerations, regions), linking the public research and innovation process (Marsh, 2008). The concept is based on a systematic user co-authoring approach that integrates research and innovation processes. This is achieved through co-creation, exploration, experimentation, and evaluation of innovative ideas, scenarios, concepts and relevant technical documents in real life (Pallot, 2009). Such use cases involve the user community, not only the observed theme but also the source of the creation. Pallot (2009) state that this consideration can be in the early stages of research and development as well as from design to a recovery of all elements of the product life-cycle.

The user-centric approach, such as action research, community informatics, contextual design, user-cantered design, participatory design, sympathetic design, emotional design method, which already exists but does not fully authorize the user to co-create it into the open development environment. LL answers this problem involving different stakeholders such as Citizens, research institutes, business organizations, public administrators and researchers (Botto, et al., 2016). More recently, Web 2.0 demonstrated the positive impact of involving the user community in new product development (NPD), such as large-scale collaborative projects (Wikipedia, crowdsourcing, and mass intelligence) to create new content and applications.

Living labs are not similar to testbed because the idea is to transform the user from the observing subject traditionally considered to be a requirement test module to value creation, to co-create and explore new ideas, ground-breaking scenarios, innovative concepts and related artifacts. Living labs, therefore, as described by Schumacher (2013) establish an experimental environment that can be immersed in a creative social space for designing and experiencing newer ideas, compared to the concept of experiential learning. Living Labs can also be used by decision-makers and users/ citizens to design, explore, experience and improve new policies and regulations in real-life scenarios to assess their potential impact before implementation (Schumacher, 2014).

In the present era, cities are considered to be key areas for coping with some social challenges, and new interest has been given to mobilizing experimental practices in urban planning. The growing interest in emphasizing the innovative emphasis on co-creation, exploration,

experimentation, and evaluation (e.g., urban living labs) must also be understood as uncertainties associated with modern growth models and their institutional arrangements:

"urban labs forgot inheritance gains new power in the present era of the crisis of modernity, progress and development "(Karvonen & van Heur, 2014, p. 387).

2.2 Living Lab as Smart Governance

This is an era where urbanization is not just a challenge to control the population of cities due to the migration of people from rural to find employment or other benefits the city has to offer. Nowadays cities can be considered as good playing grounds to implement innovative initiatives like co-creation, exploration, experimentation, and evaluation of concepts (Smas, et al., 2016) like urban living labs not forgetting the uncertainty of these concepts. Through the literature studied author attempts to mildly point out few facts related to urban living labs and related experimental practices from an urban planning and a governance perspective. It is also important to note that self-organizing initiatives in urban development could consider core principles of the urban living labs (Concili, et al., 2013) concepts of co-creation, exploration, experimentation, and evaluation as a good theoretical frame to understand themselves and position them accordingly. The studies go further to suggest that urban living labs can be structured by the governing bodies as a test bed/practice the concept of soft governance which has many positive things to offer as a whole for future urban planning (Baccarne, et al., 2014). But due to the nature and inherent shortcomings of Urban Living Labs decisions and conclusions must be critically analyzed (Guzman, et al., 2013) before adoption what is practiced here in other areas of the country/city. In conclusion, new forms of smart urban governance practices can be tested and with the help of Urban Living Labs with the user of communicative planning theory and closely focusing on actor-relations.

Urban Living Labs through public-private-people partnerships intent to offer both a methodology and an environment for social and technical innovations (Smas, et al., 2016). It sees experienced experts should not retain themselves as individual stakeholders but should contribute more by transforming themselves to co-creators of knowledge where their knowledge gained through experience will help the new. In the process of transforming these individuals, it is most likely to yield unexpected results which have to be analyzed to improve the process related to the transformations.

Because urban living labs directly get involved with the end consumer of the work under experimentation (Eskelinen, et al., n.d.), it is much easier to come to conclusions if the expected outcomes could be realistically achieved or not. Urban labs do not take into account several facts that are involved in the society in their processes like the quality of governance, policies or politics. But only gives attention to the tools, processes, and assessments of the generated technical and social innovations (Smas, et al., 2016) which are not reasonable as the society in which they wish to implement their findings are governed and controlled by policies and politics which cannot be overlooked. Smas, et al. (2016) and Nesti (2015) had tried to analyses and used the very core principles of urban labs to practice modes of soft governance for small scale projects to understand how soft governance could use for formal urban governance. Furthermore the researchers tries to suggest open innovation framework (Baccarne, et al., 2014) which can be used analyses the emergence of urban living labs and use them as a form of temporary soft spaces of urban governance which can be then mapped into formal urban planning theories and practices, this framework will be critically analyzing the engagements with communicative planning theory and actor relations.

In contrast to Living Labs concept where it focuses purely on innovation, development of new products/systems/services and working methods to integrate people with the entire system to explore, examine and experiment new ideas. Urban Living Labs add few extra components like society, social norms and politics (Baccarne, et al., 2014), hence in this context the main focus is to innovate with the involvement of various stakeholders. JPI Urban Europe concludes that urban living labs have had an important role in trying to solve many challenging multi-dimensional challenges they faced in urban areas, especially when trying the test and validate results to implement new full-scale solutions to urban stakeholders mainly in the ICT sector.

In deploying pilot projects, it is often observed that trying to find actors to exactly match the expected societal spectrum has been a challenge because currently the labs are not giving sufficient focus on the social science aspects rather emphasizing more on the technological advancements. This needs to be changed in future to change the perception of the society towards urban living labs; a social science-guided terminology is encouraged.

Juujarvi and Pesso (2013) states that there are at least three types of urban living labs. In the first type, the users can provide feedback about the products and services through a digital platform methods where the urban areas will be transformed into technology-assisted research environments. These types of methods are most suitable to gather information and data from services related to public transportation, waste management or housing. The other type of lab can

be identified as the co-creation of local spaces, services including underused or abandoned buildings, daycare services or public spaces. another type of labs can be seen in new forms of urban planning that use new tools and processes where the stakeholders involved can learn and improve the core process and also learn in the process from each other making the stakeholders co-creators of knowledge, but this types procedures or processes should not be tested with traditional planning projects.

2.3 Co-creation

The concept of socially-oriented living labs was evolved from the notion of co-developing cities where defined spaces within the city could be open to experimentation. An important fact seen in socio-spatial co-development is that it encourages the citizens and its local actors to participate in the process of improvement via a do-it-yourself approach resulting in shaping the city as expected in a friendlier manner. Given the emphasis on the common development of social space, these laboratory approaches tend to include terms such as "co-creation," "empowerment" and "participation," providing an inclusive, participatory and hands-on environment (Franz, 2014).As experienced that the current society is at a stage where they want to stay fragmented and demands more while contributing less as a civilization to the rest of the population, Urban living labs can be a useful tool if used wisely to break these trends and make people feel their importance in the society and make them involved in the process of improvement and let them be a part of the innovations.

Urban living labs is a good approach to engaging with a larger sample cross section of a diverse group of audience in the society because it simply resides within the social environment. Because of these advantages, if correctly governed when collecting results and gathering information from the end users, accurate conclusions can be drawn than assuming the test subjects might have represented all parties of the society, in this case, they will represent the majority of the society.

2.4 Territorial Governance

Researchers claim the word “governance” frequently appears in many different contexts; there is insignificant concrete literature constituting a theoretical framework in this regard. The White Paper on European Governance (2002) defines the word regarding the “rules, processes and behavior that affect the way in which powers are exercised… particularly as regards openness, participation, accountability, effectiveness, and coherence.” (Anon., n.d., p.5)

There is a quite difference in the definition of the importance in the Territorial Agenda, which defines governance as “an intensive and continuous dialogue between all stakeholders” (Marsh, 2008). ESPON (European Spatial Planning and Observation Network) define this framework a similar but more solidly “the capacity of actors, social groups and institutions (public, private and third sector) to build an organizational consensus and to agree on the contribution of each partner, such as a common vision” (Dasí , 2006, p.7).

These definitions tend to define a process rather than propose a way of managing or promoting that process (Marsh, 2008) which is also one of the concerns in this study on how to achieve territorial development through Territorial Innovation. In his paper he mentioned, openness or coherence is not the only requirement, but it goes beyond for good governance of Territorial Innovation.

CHAPTER 3: Literature Review

Introduction

For urban planning, cultural heritage mediation, the creation of a dynamic and participatory approach to the development of specific technologies and tools - the concept of responding to new users of new products and services. In the context of territorial development, Living Labs aims to combine the development of sustainable and creative cities with the participation of users at the beginning of the projects to deliver a smart, sustainable and inclusive growth by providing methods, tools, and developing products and services.

At the forefront of new uses and new technologies, Territorial development LL invites developers, designers, experts, users and stakeholders to re-read and redefine urban space and its practices to provide a balanced, sustainable and user-centric environment. The main objective is to prototype prototypes and creates innovative urban services and products.

3.1 A multidisciplinary approach

According to studies to achieve this goal, the following activities were implemented: multidisciplinary workshops, research actions, experimental and field testing, activities (bar camps, roundtables, conferences, exhibitions, multidisciplinary arts activities). The Living Labs works on multi horizontal phases;

- Cities, natural and sustainable development
- urban planning, architecture
- Mobile and digital cities
- Urban agriculture

(ENoLLL, 2015).

Territorial development proposes adapting, implementing, and using a living lab approach to address specific urban environments and their users (Marsh, 2008). Territorial development takes into account local problems, resources and population in its urban and social components.

Universities adopt this concept since early stages of LL approach. To address the competitiveness and attractiveness of the campuses, Territorial development LL designed tailored strategies for the digital value of the field. In this regard, the activities are implemented in perpetuity and enabled them to test and co-develop some 30 different types of innovative urban services:

Access, discovery and knowledge services (regions, museums, projects, sites); innovative interfaces for the general public to browse and display; services to disseminate content on collaborative platforms and social networks; services to reuse cultural public data; and collaborative classification services; digital services for arts and cultural education; innovative thematic content editing platforms; interesting services for cultural content; personalized services (family, children, groups; multilingual, electronic accessibility, e-inclusion); Digital mediation in the Territory (rich access, collaborative and critical spaces, innovative content dissemination).

3.2 Living Labs and Territorial Development

Territorial development in the European Union is outlined in what is identified as "Cohesion policy" (Marsh, 2008), "built on the assumption that redistribution between richer and poorer regions in Europe is needed to balance out the effects of further economic integration." (Danube Transnational Programme, 2016, p. 7). Cohesion policy accounts for over 35% of the total EU budget (€308 billion), of which over 80% is allocated for growth and job creation in the poorer, so-called "Convergence" regions (the European Union, 2013), now mainly from the new member states. The other two objectives are "Competitiveness and employment," with dedicated to helping the richer member states deal with economic and social change, (Danube Transnational Programme, 2016) and "Territorial co-operation" to stimulate cross-border co-operation in solving common problems (Luxembourgish Presidency of the EU Council, 2015). These funding programs, whose management is mainly decentralized to the regional level, are framed by EU Strategic Guidelines, building on of a set of policy frameworks. Of these, the Lisbon Agenda is the most familiar to the ICT community, as it targets knowledge and technology economy as a key strategy for growth, employment and competitiveness; 62% of projects funded under Cohesion Policy (European Union, 2013) are to be directed at this goal. Shortly following adoption of the Lisbon strategy in 2000, the Gothenburg strategy was introduced in 2001. Which focus towards the sustainable development; it thus adds "a third, environmental aspect to the Lisbon strategy and establishes a new approach to policy making" (Magnus, et al., 2016) by promoting participatory

and bottom-up approaches (Magnus, et al., 2016). It introduces four new policy priorities such as climate change, transport, public health and environment.

3.2.1 A "Sectoral" policy analysis

Living Labs would situate as a tool for promoting the development of the ICT research sector in a region (Marsh, 2008), attracting investments and talents and thus leading to an increase in growth and employment, according to the Lisbon agenda (Marsh, 2008). One would first identify, among the ICT R&D areas that have to date proven most effective with the Living Lab approach – wireless DSL, info-mobility, satellite-based services, etc. – those with the greatest chance of fitting with local resources. In the ERDF (European Regional Development Fund) Operational Plan for a given region – this is the actual instrument for the allocation of Cohesion policy funding – to identify the specific measures most appropriate for funding technology research initiatives.

The Sicilian Region is an example where ERDF funding of over €6.5 billion for the 2007-2013 period (Marsh, 2008) – anticipates in its ERDF Operational Plan with a specific Objective "Scientific Research and Technological Innovation" (Marsh, 2008). The likely funding available for this objective could total €50-70 million (Marsh, 2008), an important route for promoting the Living Lab approach considering that we are looking like just one of the hundreds of regions in Europe.

3.2.2 "Transversal" Policy Approach

Marsh (2008) argues that the Living Lab model can be beneficial not only as a "sectorial" policy but also as a "transversal" tool that interacts with aimed for development in a far broader way. The key to this reasoning lies in the distinctive features of the Living Lab approach itself, namely that it takes research out of the laboratory and into an area's socio-economic fabric, thus entering directly into the territorial dynamics (Concili, et al., 2013) that all regional policy initiatives attempt to act upon.

At the core of the Living Lab approach lies the idea of "co-design," through which users participate in the R&D process from the beginning, making a Living Lab deeply linked to the community level where it is set up (Concili, et al., 2013). The scope of innovation thus includes not only in the domain of technological advancement where new products and services are developed but also

the application spheres such as agriculture, tourism, environment, manufacturing, etc. and ultimately the structures, organizations and way of life of the community (Marsh, 2008) itself. As an example, according to Marsh (2008) in a situation where regional policy aims to create jobs and promote sustainable development through investments in quality bio-agricultural products, it will normally fund projects for networking entrepreneurs in the agricultural industry in a specific area and define quality standards.

Marsh (2008) talk further on bio-agriculture with related to Living Lab concept where he suggests promoting environmentally friendly practices, enacting common labeling and marketing strategies, and so in parallel to establishing an initiative for developing new ICT products and services.

Supply chain traceability, precision farming techniques, and other areas currently being developed in some of the ENoLL sites, the benefits would multiply gradually. Firstly, the platform set up for the experimentation (Guzman, et al., 2013), such as a wireless broadband network and interoperability between municipal IT systems and external services, could be transformed into a more efficient and enduring infrastructure.

Further, he explains, if the involvement of agricultural entrepreneurs introduces more efficient practices and adopting more sophisticated ICT solutions while co-designing innovative services would meet their needs to a great extent.

This encourages the community as a whole make a step forward in "innovation literacy" through the experience of working with the ICT research actors (Marsh, 2008). Studies have shown that the regional government gains a far greater chance of reaching its objectives of competitiveness for the agricultural sector by introducing the Living Lab model, independently of its effectiveness regarding R&D results (Arabska, et al., 2014).

3.3 Territorial Innovation

Since the Lisbon Agenda was first outlined in 2000 (Marsh & Trapani, 2011) policy framework on regional development has evolved considerably. Marsh and Trapani state that promotion of innovation and the knowledge economy is a far more complex matter than simply financing the ICT or generally technology sector, in addition to the need to integrate rather than simply putting next to the objective of competitiveness with that of environmental and social sustainability (Marsh & Trapani, 2011).

3.3.1 The Territorial Perspective

The researchers have highlighted the need for a better understanding of the spatial or territorial dimension of socio-economic dynamics, specifically regarding how they come into play in a specific region and its geographic, cultural and social context (EU Regional Policy, 2007).

In the EU Regional Policy (2007) "territorial" perspective on both the Lisbon and Gothenburg (Marsh, 2008) Strategies, based on an analysis of the community focus policies and their influences. Hence regarding local, regional and national and the motives of stakeholders by taking a strategic integrated territorial development approach (EU Regional Policy, 2007). It, therefore, named the objective of development policy as "Territorial Cohesion" (Marsh, 2008), where the EU Regional Policy (2008, p.1) states as;

"Secure better living conditions and quality of life with equal opportunities, oriented towards regional and local potentials, irrespective of where people live."

Marsh (2008) explains regional potentials as "Territorial Capital" which can be further described as the set of material and nonmaterial elements such as knowledge, internal resources, economic activities, infrastructures, and networks so on.

In a given territory this "Territorial Capital" would inefficiently capitalize to support the institutional and economic innovation processes necessary for sustainable development.

	Sectoral Policy	Territorial Policy
Human Capital	Train "users" with standard qualifications, e.g. ECDL	Involve all citizen groups. Develop "innovation literacy".
Territorial Infrastructures	Dedicated research centres with specialised infrastructures.	Integrate research with local and regional development actors and initiatives.
Development Strategies	Define innovation strategies with "experts" and industry interests.	Develop participatory scenarios. "Demand pull" approach to ICT investments.

Figure 4. Sectorial vs. Territorial Innovation Policy Approach (Marsh, 2008)

3.3.2 An Analytical View

To understand policy strategies implies in the territorial context, it is necessary to take a brief look through an analytical perspective at the concept of Territorial Innovation.

The actors involved remains the same as with traditional concentration and participation processes in spatial and strategic planning, and include local governments, technical experts in the various fields concerned and citizens and businesses that make up the socio-economic environment of the territory (Marsh & Trapani, 2011).

According to Marsh (2008), valorisation of Territorial Capital is a result of the interaction between political decision makers and experts. To reflect the interactions between these actors' firstly elements of Territorial Capital need to be identified and then assigned a political priority (Capello, et al., 2009).

The interaction between political deciders and citizens, businesses, and other related stakeholders are significant for territorial innovation. This goal could not achieve if there is any active political commitment to the objectives. Furthermore, the dynamic interaction between citizens, businesses, and technical experts should be active, and this is a process described as "articulation of demand" (Marsh, 2008).

According to his paper Marsh (2008), Territorial Innovation achieves through a mutual learning process as shown in the below diagram, as shown in the Figure 4 all of three actor groups come together and interact with each other and overlap.

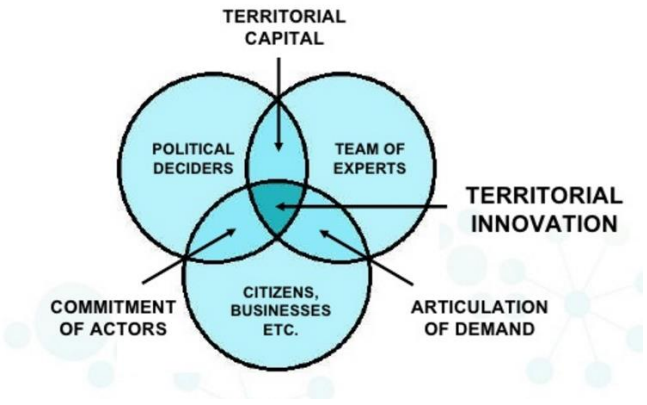

Figure 5. Territorial Innovation (Marsh, 2008)

3.4 Governance Model

The governance has always been focused on the needs of its people and has long promoted a political and operational strategy aimed at the quality of life of its citizens. Such a concept is intended to stimulate not only economic growth but also social welfare, sustainable urban interventions, and respect for diversity, and offers advanced and innovative services (Nollo, et al., 2014).

Marsh (2008) identify three models of governance relevant to Territorial Innovation. These falls under different disciplinary angles. The first, a "technical/business" model, which aim at promoting of innovation regarding the development of new products and services and sees Territorial Innovation as something to organize efficiently by shaping market conditions, defining common methodologies and building economies of scale. This top-down policy approach is typical of the European Commission's Framework Programme. It works primarily through involvements in related to regulatory spheres and monetary incentives or direct funding of specific initiatives (Marsh & Trapani, 2011). In theory, it opens the room for the free, bottom-up behavior of market actors in the field (i.e. businesses and consumers) and substantially places innovation in their hands.

Secondly political-institutional model, concentration on more political areas such as Region, Agriculture, and Citizenship, in lieu to the EU White Paper. The aim is to apply wide-ranging policy objectives, from transparency to sustainability and territorial cohesion, by influencing the strategic policy-making and normative framework (Marsh, 2008) at different levels of government. This approach promotes bottom-up processes at all levels, holding that innovation is vital to multi-level participatory processes.

The third model is the "social/spontaneous" that portrays the Open Source movement and hacker ethics (Marsh, 2008).The idea here is that of self-organizing networks similar in behavior to natural eco-systems, purportedly a spontaneous phenomenon driven by social networking processes more than policy goals. In this nonmarket and non-state philosophy (Marsh, 2008), innovation is not considered as much as an objective compared to an ethical principle, and governance occurs through a profitable network organization that naturally adapts itself to different levels of institutional competence as appropriate. There are still few guidelines as to how to initiate such dynamics within a strategic policy context.

"An innovative forum for the development of new products, systems, services and processes in urban areas; the adoption of working methods to integrate people into the development process as users and co-creators in complex and everyday environments to explore, test, Test, and evaluate new ideas, scenarios, processes, systems, concepts, and creative solutions. "Europe, 2015, p. 59, org inial emphasis)

Compared with other living laboratories, the Urban Living Labs not only increases the conceptual design of urban components but also covers a range of topics, including social, political and technical issues (Franz et al., 2015, p.). This is evident in the above definition of the Urban Living Labs provided by the Joint Program Action (JPI) City Europe (2015) in its Strategic Research and Innovation Agenda. As Franz (p. 105, p. 105) points out, "there is evidence that the EU research strategy is recently promoting the inclusion of new approaches to social innovation." Thus, in this case, the goal of the LLs is not to focus on technological innovation, but rather to promote social innovation through the participation of various stakeholders where project objectives are clear and carefully defined projects in urban areas.

In fact, JPI Cities Europe (2015) has had a significant impact on this social transition, emphasizing that LL is a particularly important tool for addressing the multifaceted challenges of urban areas, "will strategically be used for inventing and validating research results involving the relevant cities Stakeholders; to prepare for the full implementation of the new solution "(JPI European City, 2015, p. 53). However, this is not to say that living lab research activities focus only on civic engagement and social innovation (Bergvall-Kåreborn & Ståhlbrost, 2009). In contrast, the European Commission considers the LL to be a valuable tool for maintaining engagement with end users and innovation in the ICT sector (EC, 2008).

While it is important to emphasize openness and inclusiveness, it is challenging to reflect the actors of a given social spectrum (Bergvall-Kåreborn and Ståhlbrost, 2009; Franz, 2014). Concerning social and technical concerns, Franz (2014) argues that the paradigm shift from technology to social science to guide terminology may need to translate the concept of future LAB participants into "citizens" rather than "users."

According to Juujärvi and Pesso (2013), three types of urban Living labs can be found. The first type, urban areas can serve as a "technical assistance research environment," the user through the digital platform or sensor-based methods to provide feedback on the service or product. These LLs may be designed to improve the urban environment or services, such as public transport, waste management or housing. The co-creation of local spaces, services, and objects (including underutilized or abandoned buildings, day-care services or public spaces) is the second type of

laboratory. Urban Living Labs can also generate new or enhanced forms of urban planning, using new tools or processes. Here, it is central to promote local vision development and planning processes and greater opportunities for stakeholders to meet and learn from each other. In so doing, the laboratory can serve as a platform for stakeholder participation in planning and decision-making processes. However, urban living laboratories should not be mixed with traditional planning projects, as they do not necessarily lead to planning or development projects.

In the era of civil participation, social fragmentation and declining demand for greater institutional flexibility, the Urban Living Labs appear to be a tool for promoting urban social, political and economic innovation, development and cooperation. The Living Lab provides a new forum for interacting with a variety of actors. In a sense, a new model or form of (city) governance that can be used by the City Living Lab to establish a definition for the experiment, Users can become "co-creator values, ideas and innovative ideas" (Hakkarainen & Hyysalo, 2013, p. 21). In this case, LL acts as an enabler of e-Participation, according to Cleland, et al. (2012) participation is an environment which is an extension of participation in a social democratic process facilitated by use of ICT. Further, elaborate that it promotes and support citizen engagement in a modern environment such as the internet-based technologies. Cleland, et al. (2012) also mentioned that there is no concrete agreed definition and there is no straightforward understanding towards e-Participation. As discussed earlier need for innovation in the public sector can meet the requirement of modern society. Finally, it is evident that there is a beneficial interaction between the Living Labs and the e-Participation and e-Democracy domains.

CHAPTER 4: Trentino Living Lab- Case Study

Trentino region in Italy is an excellent example of the innovative ecosystem (OECD LEED, 2014) and Trento has become one of the important center of excellence in Italy (Nollo, et al., 2014) , in particularly in the field of Information Communication Technology (Ferraris & Grieco, 2015). Trentino is one of the two provinces make up Trentino-Alto Adige region (Provincia Autonoma di Trento , 2011) in Northern Italy. Trentino covers an area around 20,000 km2 with a total population of 0.5 million people. The local government invested 2.19% of their GDP in R&D which is over EU average this territory has 2.19% GDP (Ferraris & Grieco, 2015). The region has 1 University 6 Industrial Research Centres and 12 public research centers (Provincia Autonoma di Trento , 2011) which make a small territory such as Trento an excellent innovation hub.

In the area of social innovation and territorial development through the use of ICT, Trentino as a Lab plays an incredible role (Ferrari, et al., 2011), user participation in research activities and contribute to innovation in the region can be highlighted. Through this initiative of the region, they have been able to attract enterprises to develop R&D projects and created a synergy with related institutions of the area (Ferraris & Grieco, 2015).

4.1 TasLab

Trentino as a Lab (TasLab) Geographical Living Lab started in 2013 in the autonomous province of Trentino (Italy). Since then it has become the reference model innovation enabled by ICT in the Province of Trento (Informatica Trentina, n.d.), with the vision of promoting region's innovation ICT policy. Because the infrastructure in the region is not sufficient to support interoperable enterprise innovation, TasLab is a project aimed at promoting local development by promoting local innovation and research institutions. Botto, et al. (2016) describe TasLab as an early project to link to living laboratories and digital ecosystem research. This thesis will describe how the stakeholders could involve and what are the expected benefits.

The "natural" evolution of Autonomous Provence of Trento (PAT) over the past few years as part of the TasLab effort is applied to the European Living Labs Network (ENoLL).

As discussed in previous chapter Living Lab is a new concept for R & D and innovation, designed to promote Lisbon's employment and growth strategy in Europe. So what is a Living Lab? The answer depends on who you ask, because of the huge differences between existing living labs. One

thing is common to all of us; the human – centric involvement (Botto, et al., 2016) and probable development of ICT-enabled services and products, all by bringing together the different stakeholders in a co-created way.

In the TasLab the user participation is important at two different levels: as a key participant in the innovation process (co-creation) and as a user of the innovation process itself. As part of the TasLab mission, innovation will be the "way of being, thinking and developing" (Botto, et al., 2016) for Trentino and his citizens. TasLab has developed new forms of partnership and intellectual property (IPR) management, allowing users to take advantage of this dual role.

TasLab is a project driven by three key players: Informatica Trentina (InfoTn), University of Trento (UniTn) and CREATE-NET (Shvaiko, et al., 2010). InfoTn is the local division of the ICT Public Administration and intends to become a catalyst for innovation in Province through the provision of services. To accomplish this goal, UniTn provides an innovative model which called “Innovative Tripole."

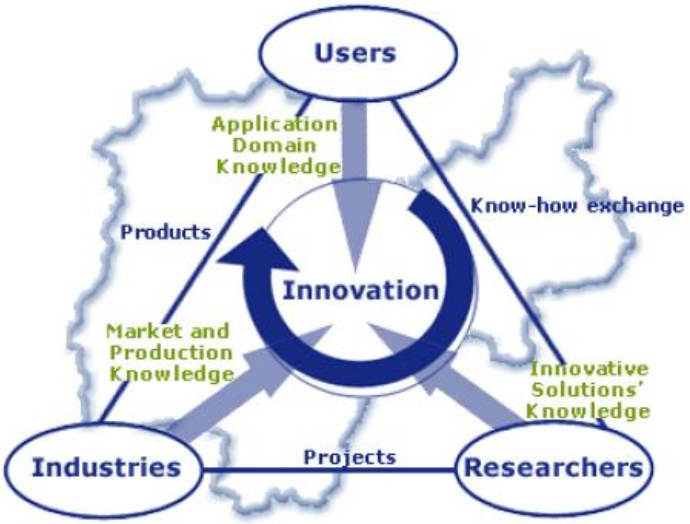

Figure 6. The Trentino Innovation Tripole (Botto, et al., 2016)

Then the CREATE-NET is responsible for (a) participation in the innovation process and (b) digital ecosystem research (see below)

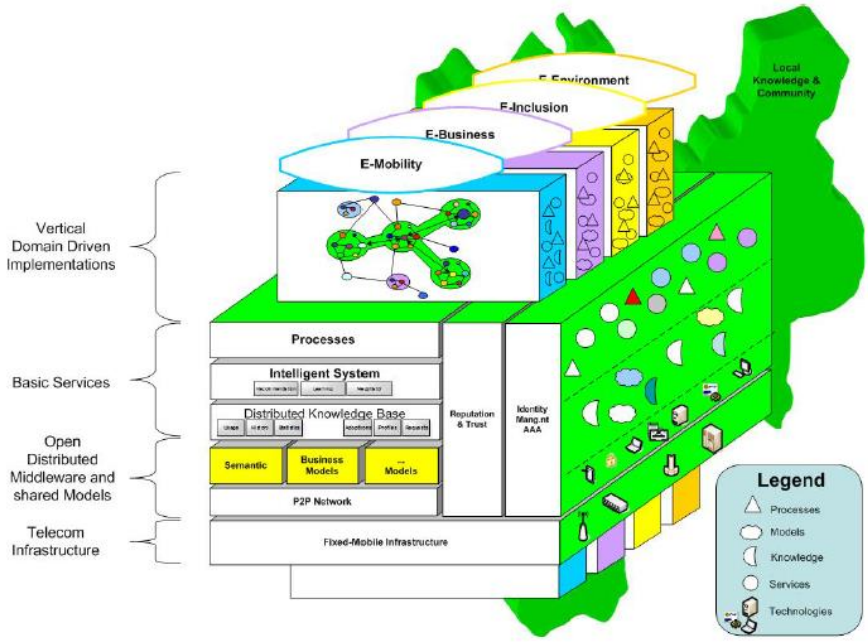

Figure 7. TasLab multidimensional Digital Ecosystem view (Botto, et al., 2016)

The core driving forces behind TasLab are related to fields of social, economic and political. TasLabs' main objective is to create an innovative infrastructure capable of responding to current and future user needs and innovation. A notable characteristic of the ecosystem is that it is not only focused on the ICT perspective but also a cultural and sociological point of view (Botto, et al., 2016). According to InfoTn, their proposal is to reduce the digital divide, while trying new ICT solutions (e-services), in-depth user participation, in the mountainous area of the Autonomous Province of Trento. As a natural consequence of this long-term vision, TasLab's primary goal is to support the endless evolution, address situations of a different process that local communities, users, and businesses face.

TasLab's approach is based on the "Innovative Tripole" (Figure 6) with the participation of all stakeholders (i.e., users, researchers, and entrepreneurs), a relationship and conceptual model that places users at the center of the innovation process, And researchers. After an in-depth analysis of legislative references and socio-technical approaches, the requirements for the development of this conceptual model were identified.

They further deliberate that initiative is accepted by national and regional laws and each R & D contract involving end-users, research centers/ universities, and industry should identify high-quality cooperation that can jointly support research and development activities with the deep involvement of research and development activities.

Regarding social technology, Tripole addresses the problem of intrinsic diversity management, which exists not only among different stakeholder groups but also within the community itself. This approach is based on a key assumption that diversity is a feature that must be retained and exploited to achieve better innovation through the joint development of new and innovative products rather than problems that must be absorbed in a unique framework (Botto, et al., 2016).

Tripole instantiation in each area, e-commerce, e-commerce, e-commerce, allowing users to participate directly and their subsequent co-creative participation in innovation. Effective coordination of actors is achieved following participatory action research methods. To this extent, the approach is to adopt an ecosystem-oriented perspective, that is, different actors (citizens, public administration, enterprises and research entities), ecosystem organisms interact with local/ global conditions. This ecosystem model is characterized by quality (interaction and activity), knowledge (creation and sharing) and openness (for different territories and cultures).

4.1.1 From TasLab to the Digital Ecosystem

TasLab also has the ambition to bring all actors into the digital world, thus becoming a digital ecosystem (DE). Moore (1993) describes enterprise ecosystem (BE) as a company, through cooperation and competition, co-evolution of innovation capabilities where the idea that in the ecosystem where individual institutions should develop in clusters to survive and develop (Moore 2003). In contrast, the Council of Europe has recently adopted the European Commission as a way to help SMEs digitize in the absence of fixed business leadership and public policy interventions (EC, 2001). The EC starts to support the new interpolation (Nachira, 2002) by adding a "number" to the BEs3 before the mole.

Thus, the digital ecosystem (Figure 7) consists of heterogeneous and autonomous users, companies, and resources interacting in a complex, distributed, and dynamic environment. The complexity of the interaction between the different agencies is increased by the fact that institutions, sometimes compete and collaborate with each other at other times to form a stable and unstable coalition, this is a DE where it forms a complex and dynamic environment (Nachira, Nicolai, Dini, Le Louarn and Rivera Leon, 2007).

Through CREATE-NET collaboration, this will be achieved through open interoperability collaboration and business platforms (Botto, et al., 2016) derived from DEs research. This platform provides a reference and distributed framework that can be used to develop interoperable and

vertical software. It will be reusable for different applications and service areas, providing great flexibility.

TasLab has promoted PPPP (Public/Private/People) partnership where every stakeholder plays a driving and framing role since 2007 (Ferrari, et al., 2011). Another major point is, private enterprises and research institutions (i.e., Universities) carry out experimentation based on new ideas on services and products where citizen participation integrated into the process. This is a value chain as described by Ferrari, et al. (2011) where "Research, Innovation, Production & Usage" come together. This is aligned with principals of user-driven, open innovation (Guzman, et al., 2013). Users (citizens) plays a major role as co-producers or another words co-creators in the Trentino Living Lab. Not just citizens of Trentino but also all people who happen to spend be in the region including tourists (for tourism and business) are also target users of the TasLab (Shvaiko, et al., 2010).

The projects developed so far such as eProcurement, Casalpina and also TREC & CSS which discussed in the later part of this chapter has a high degree of user involvement in the service design process (Ferrari, et al., 2011). Above mentioned projects designed in a way they covered the region's territorial model namely eMobility; eInclusion; Territorial; Environment (Ferrari, et al., 2011). TasLab brings together the results of past research activities and experiences into creation and deployment of pilot services and support extending of the public sector innovation environment. The local government of Trentino willing to introduce and promote innovation in the territory by a political leadership which is an important factor of any eGovernment project (Furuholt & Wahid, 2008). Further, they pilot the projects by the decisive contribution of the citizens (Ferrari, et al., 2011).

The association with research laboratories in the region and local businesses (Figure 7) with TasLab triggers and leverage the innovation process, it starts from the ideation to prototyping, testing, and deployment (Botto, et al., 2016). CSS and TREC projects can be highlighted as good examples in this case (Ferrari, et al., 2011).

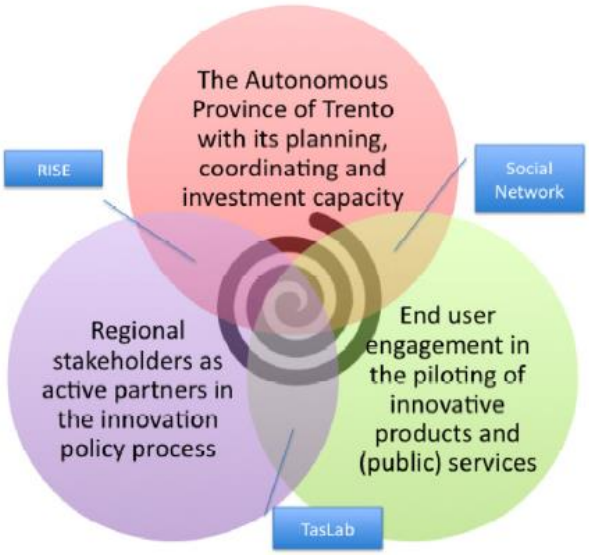

Figure 8. Trentino's innovation governance system (Ferrari, et al., 2011)

4.1.2 TREC Project

TREC (Citizen's Medical Record acronym) is a research and innovation project financed by the Ministry of Health and the Ministry of Research and Innovation of the Autonomous Province of Trento, in which Fondazione Bruno Kessler (FBK) coordinated scientifically (Mion & Parolari, 2011).

The project aims to design, develop, and test the availability of personal health records in Trento Province. This has given the opportunity yo assess its impact by providing citizens with an online service platform to access (Ferrari, et al., 2011), share and update their health records through the use of Internet portals (Mion & Parolari, 2011). This system can be volunteered by citizens to support their health management and interact online with structural and provincial health workers. In detail, TREC includes the following important dimensions (Mion & Parolari, 2011):

- TREC is an electronic health record system (Ferrari, et al., 2011) which provide access to clinical documents generated by provincial health authorities (e.g., reports, laboratory tests, discharge letters, etc.) (Shvaiko, et al., 2010) Previously only available in hardcopy. TREC will allow such documents to be downloaded over the Internet and used for storage on portable memory (e.g. USB sticks)
- TREC as a health diary. Citizens will be able to enter health data to track the evolution of diseases (such as chronic diseases) or other information (e.g., physical activity and diet), or have a constantly updated list of drugs;

- TREC supports new forms of communication with physicians and health care institutions. The system will allow citizens to interact digitally with health care professionals. The TREC can be used as a communication platform for real-time remote monitoring or as a channel for customized information to be received by health-care institutions, as required.

The main benefits expected from the introduction of TREC relate primarily to the likelihood of citizens managing their health data in an electronic format (TREC, n.d.) . These have advantages for healthcare organizations (for example, paperless administration) and citizens (for example, even when they are on vacation or business trip) in the region. Also, the TREC may evolve over time to support specific needs, and can interface with home measurement devices (Mion & Parolari, 2011) (e.g., a weight scale, a glucose meter, a device for measuring blood pressure, etc.). Citizens can also allow others to access their health information. In this way, the parents can record the child's history since the child was born, the child can obtain medical records (for example, listing drugs) of older parents or relatives. In this case, the caregiver may have access to limited information related to patients (Mion & Parolari, 2011). In general, the possibilities for accessing online information will allow people living together to share care (Mion & Parolari, 2011) and wellbeing of the society. The focus of the project is related to the safety of health data and to prevent possible intrusion, access to the system is protected by strong authentication methods that use the state-of-the-art authentication mechanisms such as smart cards / CNS, one-time passwords on mobile phones and USB / CNS.

4.1.3 CSS Project

CSS (Social Health Record) is a research and innovation project co-funded by the Ministry of Economic Development and the Autonomous Province of Trento (G. Armellin, 2010), coordinated by the scientific coordination and deployment of Informatica Trentina's FBK.

The project objective was to define the co-management of health and social welfare. The main contributions of CSS are the organization model and the event-based interoperability infrastructure, allowing different organizations to easily interoperate. Also strong privacy control over the exchanged information was established, and as well as an event-based business intelligence analysis process combined (Mion & Parolari, 2011). CSS includes functional and technical interoperability solutions that address the typical and well-known problems of cross-domain information management, including several cooperation points in the process, information

flow, and specific city-specific systems that have adapted to different needs over the years. CSS will integrate data on the social needs of people involved in social services assistance and provide it to any interested stakeholder on request: social operators, recipients, his / her family, and so on. Full interoperability will provide seamless integration of data from a variety of sources. In CSS, privacy is ensured through a two-stage access control mechanism. Each source generates notifications of only partially specified events (no sensitive data), and CSS notifies the interested consumers; each consumer must be clear through the CSS platform The details of the request source (as well as the destination statement) source only returns the allowed details always through the CSS platform. The protocol allows the source to specify different visibility rules for the purposes specified in the privacy regulations, and the CSS can track audit requests.

The combination of TREC and CSS is designed to provide citizens with access to and interaction (Ferrari, et al., 2011) with their personal social health records, allowing for a more effective, integrated and personalized care (Mion & Parolari, 2011) that is managed by cross-domain information, as well as user empowerment (Mion & Parolari, 2011), User-friendly and cost-effective system. The both projects are dealing with heterogeneous systems, different organizations, this means many privacy issues, and even business processes change over time.

These cases demonstrate the value of involvement of public users in addition to addressing technical limitations. Public administration plays a central role, and this brings them also the domain knowledge on how to deliver services to citizens. In conclusion, Mion & Parolari (2011) believes that through the use of innovation as a territorial laboratory by effectively utilize the assets of Trento, and consider that an increasing number of infrastructure will be available for hosting new experiments, new deployments, and new integrations, and this means new space for innovative e- services.

CHAPTER 5: Methodology

This chapter provides information on the research methods of this thesis. Chapter 4 describes the methods used to construct and produce the deliverables of this research.

5.1 Qualitative versus Quantitative techniques

Qualitative research was carried out to satisfy the objectives of this thesis. While the outcomes of qualitative research are no measurable and quantifiable, it has the advantage of which it offers complete description and analysis of a research subject (Bhattacherjee, 2012). It is recognized that qualitative research is used to discover facts and not verifying existing truth (Baxter, 2008). The methodology of this paper consists of case study research and literature-based research.

Case study method can provide a detailed understanding of a particular situation to create better theories then in this case how living lab concepts can foster territorial development. Hence case study approach is applicable when researching 'how' question over which the researcher has little or no control (Johnson, 2008).

5.2 Data collection method and tools

The method of analyzing available literature and case study used in this research, these methods were having been chosen due to the efficiency of data collection and based on the objectives and research questions of this study. As mentioned above a gathering of data in this study is divided into two main parts. Available supporting literature was gathered from various sources (Journal articles, Google book, Google Scholar, ENoLL, etc.), this helped to identify main concepts discussed in this research such as Living Lab, Co-creation, territorial development, territorial governance. Next empirical data were collected through investigating the case study of Trentino Living Lab (TasLab) supported by a semi-structured smaller number of interviews conducted with personals engaged with Living Lab initiative in Trentino region. This data helped shape the answers to research questions; Trentino ICT initiative provides an effective and ideal instrument to the research questions as main concepts of LL were adopted in the regional development. Their goal to drive internationalization and innovation through fostering social innovation with the help of ICT set background in this case. During the course of research the author attended several virtual

meetings, these meetings used as background information, and it helped to create a better understanding of the living labs.

5.3 Approach

Case study research and literature analysis were carried out in this study due to the lack of knowledge on the topic of the situation of Living Labs. As stated by (Yin, 2004), the case study research approach is best when the boundaries between of the study and context are unclear. This approach will help to understand Living Lab's phenomenon through qualitative data. This study has the nature of explorative approach where it uses a process in discovering the primary variables and will help develop the theory (Yin, 2004).

Eisenhardt (1989) stated that to develop the theory by combining observations from previous literature with common sense is not uncommon for researchers. Nonetheless, it is preferred to pool resources from various qualitative data from several sources (Baxter, 2008). Combining several sources allows for a reasonable analysis to understand the context and would significantly improve the validity of the conclusion (Kenneth K. Boyer, 2008).

As this thesis use the case study research, the primary problem question is formulated and identified the key variables using the literature. It is important at this stage not to construct the specific relationship between identified variables which possibly limit the outcomes. To address this point, preliminary problem question is defined a way that it allows the research process to expose the true specific findings.

The main research question asked in this thesis is: How urban living labs contribute to territorial development and Innovation of services?

Then three secondary questions formulated to answer the primary research question,

To answer the sub-questions “How do Living Labs operate in Territorial level?” it is of value to understand the concepts of sustainability focused on Urban Living Labs, if their activities contribute to the territorial development and if they are discussed in a particular way. Empirical literature used to guide the investigation seeking to answer this secondary question.

The second sub-question which is “How are Living Labs organized and in which are their domains of interests?” answered by case analysis was carried out and supporting literature was collected to help identify the main concepts in the discussion. Case study research was carried out in this study

due to the little known on the topic of the situation of Living Lab. This approach will help to understand Living Lab's phenomenon through qualitative data. This study has the nature of explorative approach where it uses a process in discovering the primary variables and will help develop the theory (Yin, 2004).

To answer the third sub-question which is “How to involve citizens during processes of research and innovation?” related previous work studied and analyzed, a case study was the major source to answer this question.

The findings from the different research parts will together help to understand what measures should be used to improve current self-service and how Estonia should do it. Possible solutions for Estonia together with the opinion about the feasibility of them is offered.

5.3.1 Analyzing Data

Data collected through desk research (literature based) from various sources such as Journal Articles, academic literature were analyzed. Then lessons from the case studies help shape the objectives of the thesis which were collected through documented studies and unstructured interviews (Yin, 2004). Baxtar (2008) explains analysis of data “should continue to develop and be completed as the study progresses.” They further state that over analyzing of data will lead to a stage called “Analysis Paralysis” which means never ending data collection. In this research, both literature review and case study methods were adopted. The data collected through document studies help enrich and appropriate to the data from the interviews as in this study it only provides limited information about the territorial development of the living labs. Even though data is collected from various sources, the primary source for analysis was data collected through desk research due to the limitations faced with in-depth interviews. Nonetheless, data collected through interviews provides this study an imperative contribution.

Data derived from documents studied used as major part of the analysis and data from interviews used to expand and elaborate on the outcome of previous empirical data. One advantage of this approach is that there is data already representing ready to be analyzed while on the other hand interviews do not.

5.3.2 Limitations

Due to time constraints, criteria was set to limit to one case study. Moreover there were a limited number of interviews. Multiple case study approach would have enabled to cover more organizations and therefore, the possibility to generalize the finding of this study would have been greater (Yin, 2004). Another limitation of this study is the limited journals on the topic as. One more limitation is that the interpretation of the qualitative data was dependent on the researcher's current understanding of the subject (Yin, 2004).

CHAPTER 6: Empirical Data and Analysis

This chapter consists of an analysis of findings of the qualitative data gathered through case study and literature review. Further this section discuss the background, operations, goals and how the project contributes to the territorial development and encourage innovation in the region of the chosen case study. In the previous chapter, the methodology of the research was explained.

In their paper, Karavinen & Heur (2014), the concept of the urban living lab and related practice discussed from the perspective of urban planning and governance put forward sympathetic criticism. In this regard, that the core principles of urban living labs (i.e., co-creation, exploration, experimentation, and evaluation) provide a useful theoretical framework to understand and position different informal self-organizing initiatives in current urban development scenario. Also, as a planning practice (or method), LL can be interpreted as a temporary soft governance model that includes some advantages in identifying new innovative approaches to urban planning. However, care must be taken because of the inherent shortcomings of living labs, democratic legitimacy, tend to be exclusive and extremely temporary. In summary, the Living Labs can be an environment for exploring new forms of intelligent urban governance, focusing on the relationship of actors through key contact.

A literature review revealed the diversity of Urban Living Labs settings, sizes and methods can further make the assessment challenging (Concili, et al., 2013) in the perspective of regional development measures. The flexibility of choice of methods and tools according to the objectives and methods of the specific urban living lab can increase the context-based relevance of context-based Urban Living Labs concepts but may limit the ability to compare, contrast and consolidate discoveries of diversity Urban Living Labs. These problems may limit the potential of Urban Living Labs development. Also, the impact of the Urban Living Labs is not a direct problem, and is not analogous to a more outcome-oriented initialization, because of the emphasis on processes, co-creation, experimentation and exploration. More specifically, the impact is seen throughout the incremental (Eskelinen, et al., n.d.) change of the project, rather than in a single end product or result. Although the problems outlined above are challenging, they need not be insurmountable. Karvonen and van Heur (2014) focus on the experimental nature in an attempt to refine the breadth of the urban Living Labs method into a measurable and comparable concept. Karvonen and van Heur (2014) further claim that urban living lab experimentation outcomes can be stressed as Geography, Change-Oriented, and Emergency, through this stakeholders can assess initiatives

where this act as a normative benchmark. This evaluation method shows promise; however, more research is necessary to improve and enhance the evaluation and comparison of urban living labs.

These central requirements in social activity planning theory can be related to the Urban Living Labs in order to inquire how they relate to the larger political context because of their work, Boelens (2010, p. 42), puts it in an actor-planning the concept of relationship, "beyond the scope of the government." They can be interpreted as a temporary, self-organizing layer of urban governance with additional layers and patterns. A central question, therefore, is to question how the Politics City Living Labs addresses fairly purely public issues in urban development (as opposed to more technical laboratories, which are often influenced by the economic interests of the firms concerned). Several problems have arisen with the association of democratic associations suggested by the Living Labs. While they deal with public concerns, to what extent are city laboratories seeking legitimacy or even accountability? In addition, power relations, domination, and exclusion develop in a unique form that depends on the context, and the results of the communicative planning process (and the Urban Living Labs as a planning practice) are intrinsically local (Healey, 2003) value Considerations Urban Life Labs in other urban development environments and processes work in parallel to the context. It is also important to question the relationship between these environments and processes regarding, for example, discourse power, institutional decision making, or even long-term material effects.

The Trentino region is a unique area in the Italy where local government work with academia, research institutes, business organizations, and citizens towards sustainable urban transformation with the aim of becoming a regional leader in innovation and sustainability (Informatica Trentina , 2016). As discussed in chapter 4 the mission of TasLab program in the Trentino region is to activate a permanent innovation process through close collaboration between public administration, research institutions, and companies (Botto, et al., 2016), this leads to the goal of developing newer opportunities by integrating stakeholders towards innovation.

As literature review designated, the TasLab project intends to develop collaboration environment which is closely related to e-Participation which is an element of successful e-Government project. TasLab promotes innovation among the local actors and encourages new ideas to come alive. This is leading to the development of the region, and it is also an important part of the smart city their aiming at. As Figure 8 shows Living Lab is a top component of ‘Smart Territory’ and greatly align with other modules. How Living Lab and smart city-related, the both concepts aim a territory where citizens can live in a sustainable environment while the optimal use of existing resources (Robledo, et al., 2014). This further attracts the use of technology to address problems within the

territory and most importantly involve people in the process. Hence, Living Lab can be described as a network which connects city and rural areas of a territory where inhabitants aware of the resources and uses these resources (MINISTRY FOR THE ENVIRONMENT AND TERRITORY, n.d.) to achieve a sustainable balance.

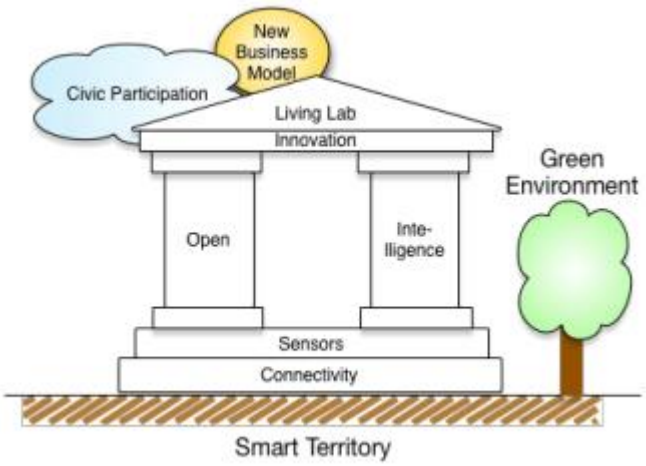

Figure 9: Components of an Innovation Ecosystem (Robledo, et al., 2014)

PAT has the idea of becoming one of the first smart territories (Robledo, et al., 2014), this is where TasLab come to play a significant role and contribution. Trentino is geographically a valley with rural mountainous regions, to achieve above mentioned goals citizens must bring together in all of this areas not only the people living in towns and give the people same access to services and quality of life. This can be seen as a challenge, and it is. The local government of Trentino has adopted the Research and Innovation Smart Specialization Strategy (RIS3) (Güçeri & Correa , 2013) recently aiming these goals. Trentino can be characterized as "promoter of citizen well-being and quality of life" (Robledo, et al., 2014) according to RIS3 where this strategy support inclusion of citizens (citizen-driven) for creating smart territory (Güçeri & Correa , 2013).

It is evident that geographical location can be a challenge to achieve LL project objectives. Local government will be looking for effective ways to approach their citizens and work together for the common goal. As seen in the Trentino case study, their goal to widen the broadband internet service could solve this problem up to some extent. The another challenge with the geographical location comes after the previous which is a lack of awareness. Awareness program could start from the project beginning to the implementation level.

Through the discussion carried out between the coordinator of TasLab, it is clear that innovation is a fundamental factor in the ecosystem they have been actively involved in their projects and initiatives within the region, he further state that;

"We are involved in using open data as a tool to create open innovation and we a have a very good collaboration and relationship between research centers such as the University of Trento and other institutions like Trento Rise which is also mainly focusing on Innovation."

As he indicated, in Trentino they work with limited resources, this is due to the slower and limited economic growth. Hence the current years are not favorable for innovations economically. But in his interview, he further claims that innovation comes to alive in such environment, and they wish to invest further in limited resources therefor.

There are positive evidence linked with the development of the region which mentioned in chapter 4, Trento has invested in R&D activates which is above the EU average. With its limited resources, they have come a long way that it is also the lowest unemployment rate in Italy which is 5 % (Ferraris & Grieco, 2015). The region has become one of the most innovative regions in Italy and quality of life of the citizens well above rest of the Italy (Provincia Autonoma di Trento , 2011). It is evident that how innovation add positive change in the lives of its citizens (Ferraris & Grieco, 2015), one good example is CCS project which discussed in chapter 4, this an indication that innovation and Living Lab concept linked with territorial development when it uses novel thinking and focus on its citizens (Ferraris & Grieco, 2015).

One limitation of this research is that analysis has only focused only on one case and the chosen case of Trentino ecosystem is smaller than other regions. Nonetheless, TasLab is an important example of innovation in territorial level and still is in its initial stages. One of the project interest is how to create more jobs and how could public services impact lives of its citizen's everyday life as the first interviewee described. In 2010 Trentino health policy maker in cooperation with the local healthcare provider developed an eHealth plan, this broadens the healthcare innovation in the territory (Nollo, et al., 2014). This plan helped to guide how regions' IT would support integrated care system to the local users/citizens. As described CSS project gives the citizens the opportunity to share data about patients across various parties in the healthcare sector. Initially, the data was enabled to share among professionals working in the health sector. According to the literature, there is a great impact on sustainability in the healthcare system in the province by innovative projects like CSS; it is also an example where integration health sector and territory. This helps to answer the 3rd secondary question, on how to involve citizens during the process of research and technological innovation. Nonetheless, still, there is much to investigate how this approach

delivers its full capabilities to the rural part of the region since digital divide. However, because of effective collaboration within health care providers, private enterprises and regions' authorities could attract European funds to the region, this could support address these issues in the long term (Nollo, et al., 2014).

It is clear that all living labs rely on technology especially infrastructure are based on ICT such as broadband.One problematic situation discovered within the region is a digital divide, even though this is an issue it is still lower than the rest of the Italy, Trentino was selected by EU as one of the best cases of broadband penetration in Europe (INDEMINI, 2013). 52% of Trentino households had access to broadband services. Authorities have been implementing medium to long term plan to address digital divide within the region (Provincia Autonoma di Trento , 2011). As Trento is a mountainous region, there are issues for fast internet access in the rural areas,

This is not only applicable to local but also industries like tourism, the relationship between tourism and technology is something that cannot be ignored by the local authorities. The technology plays a very an important role in the tourism, both as a facilitator of its growth in quantitative terms, both as a factor by which to increase and ensure the positivity of the tourist's experience during the holiday, which directly and indirectly affects regional development. According to Marsh (2008), tourists are also a participant in an urban LL. In that case, ICT infrastructure would have allowed optimizing the performance in the industry. The analysis shows that the ICT has a clear impact as part of the prmotional and commercial strategies of different tourist organizations.

Common barriers to development of small size territory and living labs identified by analyzing case study and literature can be listed as follows;

- Lack of infrastructure, lack of physical resources.
- Economic conditions of the region.
- Lack of innovation and motivation.
- Lack of awareness among the community.
- Heterogeneity of governance policy.

By looking at the case study it has demonstrated, there are several essential elements which are can be considered as vital for Living Lab to function properly. In the beginning, multiple objects need to be set and proper foundation needs to formalize. This is important to give the participants more freedom and space to innovate, if initially, it gives only one objective, there is no room for

innovation. Next as discovered should speak to all the stakeholders, this helps to create proper results and to project to sustain. It should be clear to the participants about the purpose and users should understand about the each input. Another finding is that relationship between users' needs to be trustful, TasLab focusing on using open data as a solution for this. Living Lab as a user-driven approach user involvement to occur in every phase of the process. Users are encouraged to be part of the project from the beginning; this is an effective way to gain the insight to what users from the early stages. This is also equally important to avoid unnecessary innovation where stakeholders can save limited resources. One more method of user involvement is to integrate them in the test phase; this gives the project owners the opportunity for improvements.

According to studies discussed in the literature review, another challenge is user commitments towards the project. It is said that users need to be motivated throughout the process, one suggestion was to motivate users with incentives, and this could help projects that even could last several years.

TasLab describe their deeper involvement of different stakeholders in the service innovation process, it helps the network to leverage the process, eHealth project successfully trailed this approach (Shvaiko, et al., 2010).

As Noll, et al. (2014) stated there are ten issues list by the municipality of Trento produced to achieve satisfactory level participation during a project on e-government;

1. Promote social co-design/participatory design

2. Put real people inside the work

3. Empower people to contribute throughout the process

4. Design tools for participants to give feedback

5. Take a picture of the reality through social storytelling

6. Aim for improvements in stages

7. Develop a framework to evaluate public actions

8. Bring awareness

9. Promote the importance of community and lifelong digital education

10. Involve students: university as a lab

The main research question of current thesis was how urban living labs contribute to territorial development and Innovation of services. Three sub-questions were asked to answer the main research question. First sub-question aimed to find out how are Living Labs organized and in which are their domains of interests. Second seek the answers for how do Living Labs operate in Territorial level, and third sub-questions ask how to involve citizens during processes of research and technological innovation.

It can be assumed that the status of the Living Lab concept continues to increase as territorial authorities seek to find new and more efficient ways of engaging its citizens towards more sustainable development process. This has facilitated integration among its participants and favors innovation which lead to territorial development. Living Lab is also a tool that promotes e-Government program. Living Labs gives citizens a voice and engage people from the beginning of innovation process towards designing of new services and products.

Based on the results from case study and literature review, following recommendations can list for successful implementation of services emphasis on sustainable development of Urban Living Lab:

- shared value creation and sharing among all participants
- Clear and multiple objectives
- A minimum level of openness
- establish a strong communication between actors
- establish incentive/ motivation method (gamification)

CHAPTER 7: Discussion and Conclusion

6.1 Discussion

The objective of this research was to investigate and understand how Urban Living Lab concepts are contributing to territorial development and innovation. According to the study carried out, findings shows positive outcomes of living labs where contribution to territorial development and Innovation of services. The conclusions of this research are summarized using the literature and case study discussed.

Although there are notable issues exists such as digital divide, lower continuous user involvement and limited resources in the region TasLab has implemented a project which is sustainable and innovative with their limited resources. To ensure the fulfillment of expected benefits, regional authority needs to make sure that the involvement of all the necessary stakeholders is active. According to literature, we understood that there seem to be too many initiatives, without enough clear results or objectives. A large amount of Living Labs also does not seem to have a consistent method of procedure and shows a broad diversity of approaches and thematic goals. Furthermore, there has been a notable decline in the growth of the number of active labs (Baccarne, et al., 2014), on top that there is no clear picture of the current activity level of the previously established Living Labs at European Level (Schuurman, et al., 2015). It is also essential to continuously monitor policy coherence and thus continued political commitment, on both the R&D and regional development policy goals. To a project to be called Living Lab it has some fundamental criteria's;

It has to be real life environment/situation.

Adoption of User-driven approach

Network of participants (enabler, provider, and user)

Another aspect learned is to achieve objectives of the Living Labs, there should be a proper foundation with clear multiple objectives which enables room for innovation. Also, enough interaction between all the network stakeholders will help to create and develop innovative services. Also, it is crucial in some cases that the collaborations among users need to be enabled via incentives (Nesti, 2015). This analysis partially answered the third sub research question on

‘How to involve citizens during processes of research and technological innovation.' Trentino example shows that it is important to align objectives of the actors and project objectives.

The process of change in a city the Urban Living Labs uses contextual and socially appropriate methods and can also be used to convert research into civil society applications and to enhance data collection within defined, usually local, scales (Franz, 2014). However, one needs to add critically that the Living Labs provides a structure for extending the sphere of association and participatory democracy, in parallel with other urban planning activities in a city associated with the formal participatory process of representative democracy. In other words, the Urban Living Labs is made up of a specific club; the rules of inclusion and exclusion must question severely.

Emphasizing that the exploratory nature of Living Lab approach will enable practitioners to become familiar with the concept that urban development processes can be carried out without predefined objectives. This has played a key role in encouraging participation, and co-creation. First, it reduces the likelihood that any single actor will be able to claim jurisdiction or achieve an open advantage to the content of the Living Labs during the process because it is difficult to achieve the location without a clearly defined objective or outcome. The experimental nature of the Living Labs also encourages open discussion and promotes the idea of "no stupid questions, only stupid answers." This can make it possible for the actor not to feel confident to express their opinions or challenge the traditional perspective (Karvonen & Heur, 2013). Also, the exploratory nature of the Livelihoods Laboratory helps familiarize actors with uncertainty, and the use of the concept of Urban Living Labs test ideas can encourage more creative or provocative initiatives without worrying about long-term negative consequences if an idea cannot be deployed as expected. As Karvonen and van Heur (2014, p. 387) pointed out, "one of the key strategies for uncertainty reduction is to mark a particular site as a city lab." The pursuit of this idea can be put forward, tested and evaluated by thinking long-term commitment. If an idea proves successful, it can then be applied more extensively or extensively.

However, it is also important to note, that there is a considerable variation in the Living Labs. In some cases, the Living Labs can use these concepts as a way to further develop and strengthen the dominant model of urban development. Other urban LLs may adopt a more progressive and open approach, in which cooperative and communicative initiatives promote change, recognizing the potential for change (and the inherent complexity) of contemporary urban problems (Karvonen & van Heur, 2014). However, one needs to question the way laboratory concepts can be applied carefully, as it may imply an "experimental environment" that is regulated and controlled, rather than requiring "openness" and "processing complexity." Differences between laboratories may be

problematic because it has the risk of creating a situation in which the concept of urban living labs becomes so widespread and ubiquitous that it loses meaning.

Further, LLs is identified as an essential part of the development strategy of a smart city. Living labs contribute to urban development and innovation by combining user-centric approach with technology-driven methodology (Baccarne, et al., 2014). The case study examined is related to the application domain of e-Government, as the project use ICT to improve and modernize the public administration with collaboration of other public institutions, businesses and citizens (see Figure 6). The Living Lab applications introduces technological and social innovation in the e-Government projects. To bring the social change

6.2 Conclusion

This thesis analyzed the case of Trentino region in the perspective of territorial development, which has become a virtuous example in the field of innovation and e-Government domain, further this study looked at the regions' innovation ecosystem through Living Lab where multiple heterogeneous stakeholders involve. TasLabs' goal was to bring the permanent process of innovation by collaboration and synergy among all players in the ecosystem, in Trentino, an Urban Living Lab. Finding of the literature shows that this initiative has improved the quality of life for the citizens, especially in the eHealth sector. Furthermore, it enabled integration among its actors and favors innovation development which can lead to territorial development. Urban Living Labs acts as a creative and novel environment which also explores new forms of smart urban governance. This promotes elements of e-Government program such as mainly in the area of e-Participation and e-Democracy. Living Labs gives citizens a voice and engage people from the beginning of innovation process towards new services and products.

Within this thesis work, author encountered issues related to Living Labs research. First finding a common definition of Living Lab remained problematic. Conceptualization of areas of Living Labs is challenging due to the broad definitions and initiatives put forward under the same domain. Another is declining of new Living Labs in ENoLL and growth in an inactive member of the network. At the same time, there has been an increase in academic literature on Living Labs (see Figure 1). Nonetheless, it has failed to have a greater impact on academia.

Main intention with this work was to add to the understanding of Living Labs by exploring the perspective of territorial development and experience with Living Labs. From the theoretical

perspective, this study investigated how Living Labs relate to Urban context and governance theories. Then this study explored a case study from a practice perspective.

Furthermore this thesis investigated the importance of research engagements on the quality of governance in living labs and how they inform or participate in policy and territorial development. Living Labs can be seen as an additional form of "experimental" governance because the rules of the game are often not defined to avoid limiting innovation and far-sighted thinking. However, there is a risk of becoming unequal expectations, power games and places of conflict in the governance perspective. Therefore, it is crucial for future research to investigate how these informal soft governance models relate to formal government models. However, the exploratory nature of the Urban Living Labs provides a promising way to balance power in the context of participatory urban development.

The Living Labs can be a creative environment for exploring new forms of intelligent urban governance, rather than merely proposing a new environment for applying established theories. This is closely related to the Urban Living Labs, which aims to promote creative insecurity by harnessing the innovative capacity of various actors in creating urban development. Therefore, the Living Labs may serve as an empirical environment for the development of social planning theory and practice. However, this needs to be studied and explored in real life environment, especially in the balance of stakeholder influence.

An issue that discovered which needs attention is the continuous involvement of actors of the projects throughout the process. In Urban Living Labs planners play a vital role in this regard, they are the connectors and coordinators. Partnerships between stakeholders are crucial in the living lab scenario where it involved research-based innovation, the link between public administration, research institutions and more importantly among its users (citizens) need to be strong, and they need to be motivated throughout process lifecycle to benefit and achieve objectives. Stakeholder relationship approaches it is beneficial and help to understand needs and coalitions among actors.

By combining user-centric approach with the technology-driven methodology, Living labs contribute to urban development and innovation which is also identified as an essential part of the development strategy of a smart city. Living Lab approach heavily rely on ICT on their policy domains (health, mobility, governance, energy) (Nesti, 2015). ICT has the potential of engaging citizens in the co-created services and also policy making process. But as discussed in the previous chapter, barriers like digital divide should be addressed to benefit fully. How to overcome such issues falls outside the scope of this thesis, and data here presented not to draw a conclusion in this case. Nonetheless as mentioned in chapter five strong involvement of actors in the service creation

and its success could attract the attention of funding organizations such as European Commission to answer these problems.

As thesis topic depicts, the study is carried out with the argument of that the Living Labs concept is a promising approach to implementing collaborative co-creation environments for innovation to foster territorial development. The participants of in a Living Lab have different motivations. Shared vision and motivation factors such as incentives could bring actors together for the collaboration and guide towards innovation. Also, operational activities bring different benefits to its actors, facilitate learning opportunities in various domains of the society which also could benefit for sustainability.

In conclusion, this study provides more insight into living labs. Stakeholders know the purpose of a living lab, their roles and how living labs influence to develop innovation. Moreover, stakeholders can identify advantages of living labs in the territorial development and could focus their efforts on involving in the living labs to harness benefits.

6.2.1 Future Research

Several questions arose during the investigation which needs further research. One is, in which degree of actor involvement impacts the success of a living lab, another question is how the urban living lab knowledge could spread in other domain areas and by which channels. Additionally how existing channels can reach all the actors in the region with gained knowledge. Finding answers to the above questions can produce a deeper understanding of the role of urban living labs towards more sustainability transition.

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