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Innovation Spaces for a Sustainable Survival

An exploratory multiple case study on the role of Innovation Spaces in shaping today's dynamic environment

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Abstract

Today, there is an urge to find long-term sustainable solutions. The increasing emphasis on creativity, innovation and collaboration as key sources of competitive advantage make the spaces in which these solutions are developed of key importance.

The main research question of this thesis is to explore how Innovation Spaces contribute in shaping today's dynamic environment. The goal is to understand what mind-set and interaction processes are present inside an Innovation Space, what implications they have for the society, and the role of technology and innovation inside these spaces. A secondary research question aims at investigating the impact of forced remote/smart working, increased due to the emergence of Covid-19, on innovative practices that took place inside Innovation Spaces built around physical proximity.

The methodology for this study is an explorative qualitative approach applied to a multiple case study. The data was collected through two kinds of sources: semi-structured interviews to respondents of six Innovation Spaces and a narrative literature review. Subsequently, the analysis of the primary data collection of interviews followed an Aspect-Thematic Analysis.

The key result of the analysis is the existence of three overlapping spheres of Innovation Spaces. These are *Mind-set & Human Interaction, Impact on Society & Sustainability* and *Innovation & Technology*. The first sphere of *Mind-set & Human Interaction* represents a point of intersection between the other two. Although each sphere is vital for the effectiveness of the space, the focus is on the people involved, their mind-set and the interactions that take place.

The success of an innovation space in shaping today's dynamic environment lies in the ability of who manages it to achieve the mind-set and interaction necessary to have an impact on society by leveraging effectively on innovation and technology.

Keywords: *Innovation Spaces, facilitation, interaction, collaboration, society, sustainability, innovation, technology, smart working, remote working, dynamic environment, future centers, innovation laboratories*

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1. Introduction

This chapter will present an overview of the research topic. It starts by describing the problem setting of the topic followed by a brief background framework. Thereafter, the proposed research questions are presented together with the relevant research contribution and the boundaries and limitation implied. The chapter ends with a depiction of the thesis disposition providing the structure for the thesis as a whole.

1.1 Problem Setting

We live in a world under much pressure, from the social, the environmental and the economic fields, in great need of business transformation. The challenges of the complex and uncertain environment are impelling. It is hard to keep the pace with evolving and competitive dynamics and thus, there is the need to find alternative courses of action. (Baedeker et. al., 2014).

In this context, technology, mobility of workers and the need for creative, collaborative and long-term sustainable solutions play a role. Work organization are undertaking a period of rapid change due to changes in technology, to increasing globalization trends and changing lifestyles and workforces (Penn & Desyllas, 1999). Today, people are not bound to a certain place, there is much mobility of workers and new trends of smart working are emerging (Oksaken & Stalhe, 2013).

Moreover, sustainability is today a prerequisite for any product or service. The present patterns of production and consumption in the industrialized countries cannot be sustained much longer and are causing impelling environmental problems (Liedtke et. al., 2012). As a result, the fast pace in economic, social and technological changes have increased the emphasis on creativity and innovation as the key source for competitive advantage. Thus, the question is not whether to innovate, but how to do it successfully. (Magadley & Birdi 2009).

To face these challenges, innovation acquires a significant role as a means to create new value for our society. Accordingly, the spaces in which creative and innovative activities take place require greater attention and represent an increasingly important part of the innovation process (Moultrie et. al, 2007). Indeed, as a managerial response to today's context, there has been a rapid growth in dedicated spaces for innovative processes to take place. They represent a pragmatic response to intangible problems, such as the need to be more creative and future-oriented. (Lewis & Moultrie, 2005). Innovation Spaces are transforming the landscape in a critical way. (Wagner & Watch, 2017).

1.2 Background Framework

We are to restructure organizations to respond to an increasingly dynamic and uncertain future environment, as described in the problem setting. To understand how this restructuring should be done and what will be the impact, it is useful understanding what main drivers have led this process.

In the context of design of Innovation Spaces, there is a growing focus on two main concepts strictly linked one another: creativity and collaboration. They represent a key source for competitive advantage when it comes to face critical issues in dynamic environments (Magadley & Birdi 2009). During the years, many scholars have taken care in defining and interpreting the terms. Below, some introducing literature regarding these two elements is presented.

Creativity is considered by Moultrie et al. (2007) as "an ongoing process of problem finding, problem solving, and solution implementation activity', strongly determined by the organizational climate. Some dimensions of the latter presented by the authors include challenge, freedom, dynamism, trust, openness, playfulness, conflicts, and risk-taking. Thus, to support creative activities, the "environment must reflect and enable an organizational climate which supports creativity in addition to providing a physical reinforcement of desirable creative behaviors".

Collaboration is increasingly defined as an organizational 'meta-capability' and the absence of this capability can lead to a collaborative disadvantage (Miles, Snow & Miles, 2000). Today, learning in an organization requires acquisition of diverse information and the ability to share common understanding in the organization in order to exploit it (Haner, 2005). As Robinson and Stern (1997) state, "the age of the lone heroic inventor is over". Several studies found that innovation generated by teams are likely to be more successful than those by sole inventors (Wagner & Watch, 2017). The changing nature of our economy stands indeed in the concept of open innovation, term coined by Henry Chesbrough and defined as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively" (Chesbrough 2003).

Providing support for creative and collaborative innovation processes means facilitating the activities that are carried out, and this can have a spatial dimension. The managerial implication stands in the fact that organizations will need to purposefully address the issue of spatial support to embrace these two concepts (Moultrie et. al, 2007). The result of these forces is the creation of Innovation Spaces. They are considered "spaces that strengthen interactions, communication, and collaboration; and spaces that are open, transparent and contextually responsive." The changing nature of innovation has translated traditional offices into open, flexible spaces where separate professions meet and

interact. They vary from research institutes, to incubators, accelerators, innovation centers, co-working spaces and start-up spaces (Wagner & Watch, 2017).

The ability to develop new ideas and innovations is one of the priorities for organization in order to gain a sustainable competitive advantage. It is today required to innovate, not just occasionally, but on a relatively frequent basis and with a solid success rate. (Lawson & Samson, 2001). Thus, what is known for sure is that "as our global economy places greater value on innovation as a means to grow, the role of Innovation Spaces will equally rise" (Wagner & Watch, 2017).

Therefore, the study of Innovation Spaces appears to be very interesting and relevant in today's landscape and ecosystem. By observing different kinds of Innovation Spaces, it will be possible to gain insight in how they are transforming traditional ways of making business as well as new methods to face complex problems through participatory, creative and collaborative processes. Moreover, inquiring upon their impact will be very interesting to understand how they contribute to increase the development of sustainable solutions and how they affect innovation capabilities of the organizations.

1.3 Proposed Research Question

In my bachelor thesis, I have explored to which level disruptive innovations can play a key role in creating a sustainable development that is ecological, social and economic value. I concluded that these kinds of innovation have the power to change the dynamics and the existing standards of the reality we live in, creating new ones. The more radical the idea, the more outstanding the outturn can be, and attempting to pursue it in a sustainable direction will indeed be a key to sustainable development.

I now ask myself: "What is the space where these two concepts, innovation and sustainable development, can coexist and mutually grow?" In this context, Innovation Spaces play an important role. The only way to achieve a sustainable competitive advantage is by creating spaces that will foster the right conditions to develop new ideas and innovations (Liedtke et. al., 2012), (Lawson & Samson, 2001). Indeed, Innovation Spaces have the potential to enable interaction and collaboration, reinforce corporate values and support group creativity. They represent today a growing portfolio of workspaces cradling the process of innovation and every-day experimentation (Moultrie et. al, 2007).

Thus, the thesis has the objective to study the ability of Innovation Spaces to change current practices and rules of the game, by fostering the co-creation of participatory and sustainable innovative processes. First, the focus will be on analyzing different types of Innovation Spaces and understanding the key aspects and challenges of each one as well as their unique characteristics. Then,

the study will take a broader view and inquire on what these spaces entail for the society and ecosystem where they are located, as well as the role of people and technology inside. The primary research question will be the following:

- "How do Innovation Spaces contribute in shaping today's dynamic environment?"

The term *dynamic* has been chosen to describe today's environment due to the main three trends identified in the problem setting of the topic. Firstly, the pressures from the social, environmental and economic field push for need of business transformation and long-term sustainable solutions to survive. Sustainability is considered a prerequisite for any product and service. Secondly, there is an increasing emphasis on creativity and innovation as key source of competitive advantage. Thirdly, people are not bound to a certain place but there is an increasing mobility of workers and trends of smart working are emerging.

From these considerations of the primary research question, derives the title of the thesis. "Innovation Spaces for a Sustainable Survival" implies that these dedicated spaces represent the long-run solution that will allow the organization and people involved to survive to the above-mentioned *dynamic* environment.

Due to the broadness of the primary research question and for sake of simplicity, the following research sub questions have been developed:

1. "What mind-set and interaction processes are present inside an Innovation Space?"
2. "Do Innovation Spaces have implications for the society?"
3. "What is the role of technology and innovation inside an Innovation Space?"

Moreover, it is relevant to notice that I found myself writing a master thesis around Innovation Spaces in a very crucial moment where the spread of COVID-19 forces the society to practice social distancing and, in most cases, smart working. From this situation, it appeared logical and of substantial relevance, taking into consideration this aspect in my thesis project. Thus, a secondary research question followed from this reasoning:

- "What is the impact of remote/smart working on innovative practices that took place inside spaces built ad-hoc and around physical proximity?"

1.4 Research Contribution

There have been many studies demonstrating the relation between environment and its connection to social interaction and communication and about the direct link between place and creativity (Oksaken & Stalhe, 2013). Moreover, the issue regarding the impact of work environment on work performance and innovation has been discussed in many fields (Haner, 2005).

However, many issues remain today relatively unexplored, such as the capacities needed to develop innovative spaces as well as the careful study about the cultural context, the people and their beliefs and values (Wagner & Watch, 2017). There is also little evidence of their benefits and effects on innovation performance, and how this, in turn, matches the underlying strategic intentions of the organization (Moultrie et. al, 2007). Knowledge on how physical space enhances creativity and innovativeness is limited (Oksaken & Stalhe, 2013).

This thesis aims at filling this gap through close observation of users' and managers' perspectives in their Innovation Spaces, understanding innovative processes in the daily life. The relevance of this thesis stands in the analysis of opportunities and challenges of Innovation Spaces in order to truly understand their implication for the society. It can open a discussion on the role of spaces for innovation as a place where innovation and sustainability meet and provide long-run solutions. The peculiarity of the study also stands in the comparison between an Italian and Swedish scenario for Innovation Spaces, since both realities will be observed.

Moreover, it adds new knowledge in the area of innovation management, since physical spaces are considered a useful resource in order to innovate. A further field where a contribution is provided, is that of organizational change, by presenting a basis to design work environments that support innovative practices.

1.5 Research Boundaries and Limitations

This is not a study on architecture but on innovation management. The focus will be on understanding what kind of innovative activities take place in these spaces. In particular, how the decision to have a dedicated space for innovation will impact on the success of these activities. No physical design aspect will be taken in consideration, such as architectural characteristics. Rather, the emphasis will be more on the technologies adopted, the human facilitation processes applied and the role as a whole of these kind of places as well as their impact on the external environment.

1.6 Thesis Disposition

In order to provide guidance for the reader, the structure of the thesis is presented below.

1. Introduction: presents the research project to the reader through a problem setting, a background framework and the discussion of the proposed research questions. Moreover, the research contribution as well as the boundaries and limitations are outlined.
2. Theoretical Framework: describes the relevant literature for this study, including the description of different types of Innovation Spaces and the different spheres.
3. Methodology: outlines the choices of methodology used to conduct the research, regarding research strategy, research design, data collection and analysis, research quality and final reflections upon these decisions.
4. Results and Empirical Findings: presents the main findings from the primary data collection of semi-structured interviews.
5. Data Analysis: provides the connections between the empirical findings and the theoretical framework.
6. Conclusions and Recommendations: answers the research questions, presents practical implications and discusses recommendations for future areas of research.

2. Theoretical Framework

This chapter will present the theoretical foundation of the study. Firstly, a comprehensive presentation of Innovation Spaces will be provided, covering the definition, the relationship with creativity and the attributes and dimension of Innovation Spaces. Further, different types of spaces will be described, including innovation laboratories, future centers, living labs and smart working centers. In the third part of the theoretical framework, the impact of these spaces will be analyzed, in relation to the three main spheres of Innovation Spaces: mind-set & human interaction, impact on society & sustainability and innovation & technology.

2.1 Innovation Spaces

2.1.1 What are Innovation Spaces?

Innovation Spaces are considered "spaces that strengthen interactions, communication, and collaboration; and spaces that are open, transparent and contextually responsive." As stated by an architect: "Innovative spaces do not dictate or restrict process and creativity, but instead open new ways of communication and sharing and lead to new and exciting ideas" (Wagner & Watch, 2017). Innovation Spaces have transformed the modern landscape and represent an important part of the innovation process of an organization. The changing nature of innovation is transforming spaces into open, flexible spaces where separate professions and disciplines easily converge (Wagner & Watch, 2017).

Companies that use their space more diligently can generate better ideas and facilitate the creative process (Kristensen, 2004). The design of an effective workspace has the potential to create desirable interactions and outcomes, reinforcing innovation performance, corporate values, visualization and model making facilities and the ability to reconfigure for new projects. It can encourage consumer input and support group communication and creativity (Moultrie et al., 2007). These spaces are undergoing a period of considerable growth. They include research institutes, incubators, accelerators, innovation centers, co-working spaces and start-up spaces. The most effective spaces have moved away from style, revisiting core values and re-adapting earlier and imperfect models of design to strengthen "human-ness." The goals of modern architects and designers are that of redesigning spaces to create communities, facilitate collaboration and create serendipitous encounters (Wagner & Watch, 2017).

The innovation environment can be considered part of the overall innovation strategy. However, environments are rarely created with an underpinning strategic intent, which should provide the stimulus for designing a specific innovation environment. It is a starting point in order to understand how this environment links to the wider innovation process and the needs and types of people that will use the space (Moultrie et al., 2007). The following figure **(Figure 1)** presented by Moultrie et al. (2007) outlines some typical motivations for considering the innovation environment as a part of the overall innovation or business strategy.

	Strategic intent
Strategic goals	To support the firm's basis of competition
Symbolic goals	To symbolically reinforce the firm's innovation strategy or corporate values
Innovation efficiency	To reduce innovation costs, improve staff productivity, improve speed or lower facility costs
Innovation effectiveness	To improve the quality of innovation outputs, increase the quality and quantity of new ideas and improve the chances of new products succeeding
Teamwork	To enhance teamwork in innovation, encouraging better communication (physical or virtual), encourage formal and informal social interaction and motivate staff
Customer input	To enable customer input at any (or a specific) stage of the innovation process (from idea through to evaluation concepts and product demonstration to support sales)
Capabilities	Development of specific capabilities for enabling and renewal of dynamic capabilities

Figure 1 – Strategic Intent of Innovation Environments (Moultrie et al., 2007)

The presence of an underpinning strategic intent can prevent both dedicated facilities and everyday working environments becoming irrelevant spaces with an apparent but lacking purpose (Moultrie et al., 2007).

The environment itself can be a relevant part of the firms' innovation strategy and can in turn influence performance in innovation. Thus, the environment should be a conscious (rather than ad hoc) aspect of any innovation strategy. In addition, if a firm is to invest resources in the creation of a dedicated innovation environment, then it is essential that the strategic intentions underpinning this space are explicit (Moultrie et al., 2007).

Architects of Innovation Spaces are considered catch-all generalists. They are intellectually curious, exploring complex innovation processes to understand their physical implications. They combine intuitive insight as well as promoting ideas from workers that use that space day-to-day. They work across disciplines and hierarchies and this creates spaces that have blurred boundaries, offering a

range of activities that once were separate. The key is elevating the role of people and acknowledging them as a critical link between innovation and place (Wagner & Watch, 2017).

During the study of Wagner and Watch (2017), architects were asked how innovative spaces have changed over the last 10 years and they have made three broad observations. First, that technology is more pervasive, connecting people to ideas and to each other in new ways. Second, architects underlined that innovative spaces are more open, transparent and inviting. The third observation is that design no longer takes place in the mind of leaders of an organization. Rather, the process now includes all those people who will use the space. This idea supports the "democratization" of innovation, where workers are elevated and empowered to express their own idea on how a space should be molded to support their needs and ambitions. As our global economy places greater value on innovation as a means to grow, the role of Innovation Spaces will equally rise (Wagner & Watch, 2017).

2.1.2 Innovation Spaces and Creativity

Companies that use their space more diligently can generate better ideas and facilitate the creative process. Creative individuals are motivated by curiosity, show a risk-taking attitude and actively seek new knowledge (Kristensen, 2004).

Many models regarding creative processes have been introduced, but the most emblematic is Wallas Model (1926) and recognizes four phases: preparation, incubation, insight and elaboration & evaluation. Regarding the (1) Preparation Stage, the main issue is to facilitate data and information for the process. It is central for the stage to set the common goals and allow for as much information flow as possible. Then, the (2) incubation stage is the cognitive process of problem solving can be both an individual or team activity. The (3) insight or "illumination" stage is a flash that occurs when the winning concept comes up across the barriers of consciousness. (4) Elaboration and evaluation have value creation at its center, and through a thorough analysis, it is observed whether the desired goals are met.

Concepts of space are difficult to elaborate, but the most basic to deal with is that of place. "Place" must be established before space is, and it refers to the physical extent or territoriality, whether in the home or at work. "Space" is instead the built environment and includes shelter, confinement and protection. Architects and builders then create physical space and this represents the foundation of what we perceive. Physical space regards the objective aspects and the perceived space relates to the subjective aspects. Many emotions and experiences are attributed to space, resulting to the connection

between space and imagination. In turn, physical space is correlated with cognitive space. Cognition and emotion integrate body and mind, and this activity has to be considered together with the physical reality where it is "situated", where challenges are met and action is required (Kristensen, 2004).

Creativity is a process that brings new knowledge together, and this is synthetized to bring new insights through a mental process. According to Kristensen (2004), there seem to be four sub-processes, layered into each other and strongly interconnected and simultaneous. The processes are value-creation, scaffolding, imagination, and materialization processes. Each of these processes run though the four phases of the Wallas model, but not with the same intensity. (a) Value creation completely penetrates the creative process that takes place in close co-operation with the value chains of the company. (b) Scaffolding means that a creative process is designed within a context of space, tools, people and information. Any cognitive process goes on within a mediating cultural and physical context and is environmentally embedded (Clark, 2000). The context expresses the information and knowledge created in cognitive processes thus, any studio or laboratory supports its specific activities to match their ways of creative working. Shape and configuration are examples of spatial issues to consider. (c) Imagination is concerned with new insights coming from creative, free, open-ended activities by which we achieve new ways of experiencing and integrating knowledge. Imagination is the representation of what does not yet exist, to envision and to create. It seems to be a very visual activity and this can happen only in flexible spaces. Lastly, the (d) Materialization Process transforms concepts into material objects. Whenever possible an idea or concept should be materialized. Indeed, some cognitive processes are only possible when externalized and the environment facilitates this though space, surfaces and objects. In addition, memory is supported by using space. Creative people externalize mental constructions in order to work better with them (Kristensen, 2004).

Organizational climate plays a role in the expression of creativity (Moultrie et al., 2007). Dimensions of organizational climate include challenge, freedom, dynamism, trust, openness, playfulness, conflicts, debate, and risk-taking. In addition, six categories of environment are challenge/pressures, freedom, resources, work-group encouragement, organizational encouragement and supervisory encouragement. Regarding the physical space of creativity, rather than the cultural and managerial context, 'locality' can also act as catalysts for creativity. Thus, to support creative activities, the physical environment must reflect and enable an organizational climate, which supports creativity in addition to providing a physical reinforcement of desirable creative behaviors. In an organizational setting, creativity can be defined as 'an ongoing process of problem finding, problem solving, and solution implementation activity' (Moultrie et al., 2007).

2.1.3 Dimensions of Innovation Spaces

Knowledge on how physical space enhances creativity and innovativeness is limited (Oksaken & Stalhe, 2013). The study of Oksanen and Ståhle (2013) sheds light on this relationship recognizing dimensions of physical space that foster innovation.

Indeed, a physical space both supports innovation and reflects the changing features, representing the changing drivers of innovation such as openness, collaboration, sustainability and wellbeing. Five characteristics of innovative spaces that support innovation are the following: *Collaboration and Communication Enabling spaces, Modifiable space, Intellectual spaces, Attracting spaces and Value reflecting spaces.*

For what regards *collaboration and communication enabling spaces*, innovation is viewed as a social process consisting in an ideal working environment that enables fruitful interaction between different actors. *Modifiable spaces* imply that innovation requires flexibility in carrying out activities that allows that same space to change and serve very diverse purposes at different times. It should be designed to fulfil and respond to varying needs of users. According to the idea of *Intellectual spaces*, they should be linked to certain key technologies. These smart spaces enable co-operation of smart objects for interaction between users. An example is the equipment of visual and radio sensing systems or augmented reality. Moreover, these space should be *Attracting* since interesting spaces attract interesting people. Innovation Spaces must make people feel comfortable and willing to stay there. Lastly, *Value Reflecting spaces* suggest that Innovation Spaces can be viewed as a continuation of one's identity, providing a message or story about the organization. It should support the firm's values and company culture to inspire people (Oksaken & Stalhe, 2013).

Moreover, according to Wagner & Watch, (2017), there are some important insights provided by Innovation Spaces. These include the fact that "open" and collaborative nature of innovation is changing the nature of design. Innovation consists in a process aimed at achieving both incremental and disruptive innovation. Several studies found that innovation generated by teams are likely to be more successful than those by lone inventors are. Designers described some strategies to create a collaborative environment through design team mixing and flexible workplaces in design. A further trend is that the complexity of innovation is re-valuing face-to-face communication, as well as interactive sharing places. Moreover, the growing role of technology is driving firms to experiment in balancing organizational desires, technological power and human needs. Technology has re-established how, where and when people connect and communicate (Wagner & Watch, 2017).

2.2 Types of Innovation Spaces

Regarding the presentation of specific types of Innovation Spaces, the four most relevant ones for the study have been selected. These include *Innovation Laboratories, Future Centers, Living lab research infrastructure* and *Smart Working Centers*. Indeed, as will be noticeable further on with the research, the case studies selected mainly regard the first two types of Innovation Spaces. The other two types of Innovation Spaces appeared to be significant for the study since they are strictly connected to some research questions of the study. As observed in the following paragraphs, the *Living lab research infrastructure* relates much to the goal of finding long-run sustainable solutions (research sub-question 2) and the *Smart Working Centers* tackle the topic that is relevant to investigate over the impact of remote/smart working on innovative practices (secondary research question).

2.2.1 Innovation Laboratories

The fast pace in economic, social and technological changes have increased the emphasis on creativity and innovation as the key source for competitive advantage. One recent approach is the creation of Innovation Labs. They are defined "dedicated physical environments or facilities with collaborative workspaces in which groups and teams of employees can engage with each other in order to explore and extend their creative thinking beyond and above normal boundaries" (Magadley & Birdi, 2009). Their aim is to encourage creativity, generate out-of-the-box ideas and think about how these ideas can be implemented. There has been a rapid growth of innovation laboratories in the last two decades as a managerial response to various challenges associated with organization capability development and learning. They represent a pragmatic response to intangible problems, such as the need to be more creative and future-oriented (Lewis & Moultrie, 2005).

Crucial for innovation labs is the physical layout or the structural configuration. These have not been designed arbitrarily, but rather diligently purpose-built in order to create a space conducive to group creativity. In addition, also high-tech and low-tech supporting tools contribute to create the encouraging creative climate and facilitate group work. This may also have positive effects in group problem solving, productivity and effectiveness (Magadley & Birdi, 2009).

The conceptual ingredients of an innovation lab are time, space and technology. Firstly, it is commonly recognized that groups in organizations that are in early stages of an innovation process should be given time to get away from the usual workplace. Innovation labs provide this dedicated time of reflection and engagement in creative activities (West, 2002). Space also plays a role in helping employees clear their minds and focus on creative tasks (Moultrie et. al, 2007). Moreover,

idea generation techniques are at the heart of many innovation labs, such as electronic brainstorming software (Magadley & Birdi, 2009).

According to Lewis and Moultrie (2005), Innovation Laboratories have both structural and infrastructural dimensions. The former regards the physical research setting dedicated to conducting specific types of experiment, in this sense; architecture has a crucial influence upon the participant behavior. The infrastructure then regards the setting for an experiment comprising simple devices like writing spaces and materials for visualization as well as sophisticated ICT to support group brainstorming.

There are many evident benefits of Innovation Laboratories. The success of Innovation Labs can be traced back, in part, to facilitators. Great importance was given to their ability to facilitate group discussion and manage the mood and motivation of group members (Magadley & Birdi, 2009). Moreover, they provide a set of resources to be dynamically reconfigured dependent on the issue under consideration. That is allowing for the development of dynamic capabilities that evolve and adapt themselves to enable the creation of new value creating strategies. This results in a double-loop learning that starts from questioning the main values and norms of a company, challenging assumptions and aiming at re-framing the questions. The main advantage is that it prevents the organization from becoming too conservative. This double-loop learning may appear also as a disadvantage. Constant questioning of routines may lead to spending too much time "thinking rather than doing" and create instability due to over analysis and over response (Lewis & Moultrie, 2005).

Some challenges for the innovation lab have been recognized by the authors Magadley and Birdi (2009) and regard the implementation of ideas. Indeed, it appears to be simple to come up with a large number of ideas, but then this requires much effort in evaluating the feasibility of implementing them, due to practical and financial constraints. Nonetheless, what is witnessed in these centers is many times the idea generation stage but not the implementation stage, which often takes place in the traditional workplace. A further challenge regards the unwillingness of many people involved to abandon completely the traditional face-to-face brainstorming in favor of the electronic mode. The exclusive reliance on electronics modes could result in negative effects on creativity and motivation and rather, achieving a balance between technological and traditional modes could be the best way to achieve maximum results. A last concern is taken from a financial perspective. Innovation labs are commonly future oriented and need to be perpetually updated against the fast changing technological background. This implies an increasing financial strain on budgets and a difficulty to be continually renewed (Magadley & Birdi, 2009).

Assessing the effectiveness of innovation labs has been a common issue but research is limited. As Lewis and Moultrie (2005) reported, the main element in ensuring that centers work effectively is human facilitation. This can result in reinforcing corporate commitment of innovation and creativity. Other evaluation studies capture only idea generation relying on students under lab conditions and implying much interpretation and subjectivity. This method appeared to have many drawback and limitations. A further effectiveness evaluation of innovation labs is based entirely on a user perspective focus on different outcome criterion. The first is the impact on creativity, conceptualized as the generation of ideas on two dimensions, respectively quantity and quality. The second outcome criterion considers participants' attitudes towards the innovation lab as well as towards getting away from the workplace to engage in creative thinking activities (Magadley & Birdi, 2009).

Overall, the findings until now indicate that innovation lab have a positive impact on creativity and on participants' attitudes towards it. This is due to the key concepts of innovation labs such as time and place to engage in creative thinking and the technology needed to facilitate such process. However, a further important aspect is human facilitation of people. These four aspects interact with and complement one another (Magadley & Birdi, 2009). Main conclusions include the fact that the physical form of an innovation laboratory is much more than an aesthetic issue, but rather it is integral to the functionality of the facility. It is important to avoid creating structures that minimize the flexibility. Moreover, the presence of high and low tech is equally important in determining the effectiveness of an innovation lab (Lewis & Moultrie, 2005).

2.2.2 Future Centers

A future center can be considered an urban innovation engine for the knowledge city that is a "system which can trigger, generate, foster and catalyze innovation in a city" (Dvir et al., 2006). The Swedish company Skandia established the first future center in 1997 and from that moment, several others have been created with the scope to shape the transition of work and workplaces (Edvinsson, 2003). In practice, they take care of facilitating working environment providing new ways of thinking and doing and helping organizations prepare for the future in a proactive way. They are used to create collaborative and stimulating spaces, new methods and knowledge and finally develop practical innovations. They assume different forms in different organizations and can be broadly categorized into three groups: corporate business oriented future centers, public future centers and regional future centers (Dvir et al., 2006).

Another way of thinking of future centers is that of a systemic bridge to the future that is a complex system of multiple interlinked elements. Through networked interactions where agents connect with and adapt to each other, they can spontaneously create novelties. Future centers can provide the right enabling environment to bridge networked communities of people and the future they seek to create together (Dvir et al., 2006).

Despite, each future centers' uniqueness, Dvir et. al (2006) have identified 13 building blocks for a future center. The first is *time*, for which this type of system can provide people with the opportunity to dedicate some specific amount of time to thinking and preparing for the future. Secondly, *physical space* plays a fundamental role in determining how space can inspire creativity; indeed, the playful design of most future centers proves the fact that creative spaces can significantly result in innovative thinking and open mindedness. Thirdly, *teams and leadership* are essential to create the strong vision of these types of organization, which stress the need for renewal and take a systematic approach towards its achievement. Then, *tolerance of risk* allows for out-of-the-box thinking, breaking assumptions and pushing the boundaries of the unknown. The fifth building bleak of this innovative environment is s*trategy*. This has to be clearly communicates across all levels of the organization and has to be closely connected to the overall strategy of the organization to allow observing in practice the added value it provides to it. Moreover, a future center must leverage on its *virtual space*, meaning the supportive role of technology that can have benefits in many different ways, such as facilitating communication between distant members and catalyzing the flow of ideas. *Structured and spontaneous processes* must coexist in innovative companies, leaving space for possibilities of surprises as well as powerful process to capture the good ideas and turn them into value. Furthermore, *knowledge management* will play a key role in the creation of new knowledge. Indeed, most future centers are equipped with networked workstations to provide access to a virtual knowledge world. *Financial capital* and relevant investments are also main contributors in transforming ideas into viable products and services. Building block 10 regards *Diversity* as the basis to achieve fruitful discussions and multiple views and perspectives on the same topic which final result in general enrichment of the innovative space. Skandia future center is a clear example of how intra-generational levels as well as people with different backgrounds were grouped together to ensure multiple perspectives. Overall, a particular *attention to the future* has to be on top of the mind of people involved. Excellence in innovation derives from focusing on the long run rather than on day-to-day tasks. *Challenges* that are open-ended, non-structured and of critical importance represent another key assumption for future centers. They imply a higher degree of creativity and the opportunity to seek for sustainable and durable solutions. Finally yet importantly, *conversation* represents the unifying principle and core element for future centers (Dvir et al., 2006).

Summarizing, the 13 building blocks are time, physical space, teams & leadership, tolerance of risk, strategy, virtual space, structured and spontaneous processes, knowledge management, financial capital, diversity, attention to the future, challenges and conversation.

Future centers can be broadly categorized into three groups: corporate business-oriented future centers, public future centers and regional future centers. The figure below **(Figure 2)** presents a generic conceptual model for the implementation of a regional future center. It emphasizes the necessary ingredients that are elaborated in the section below (Dvir et al., 2006).

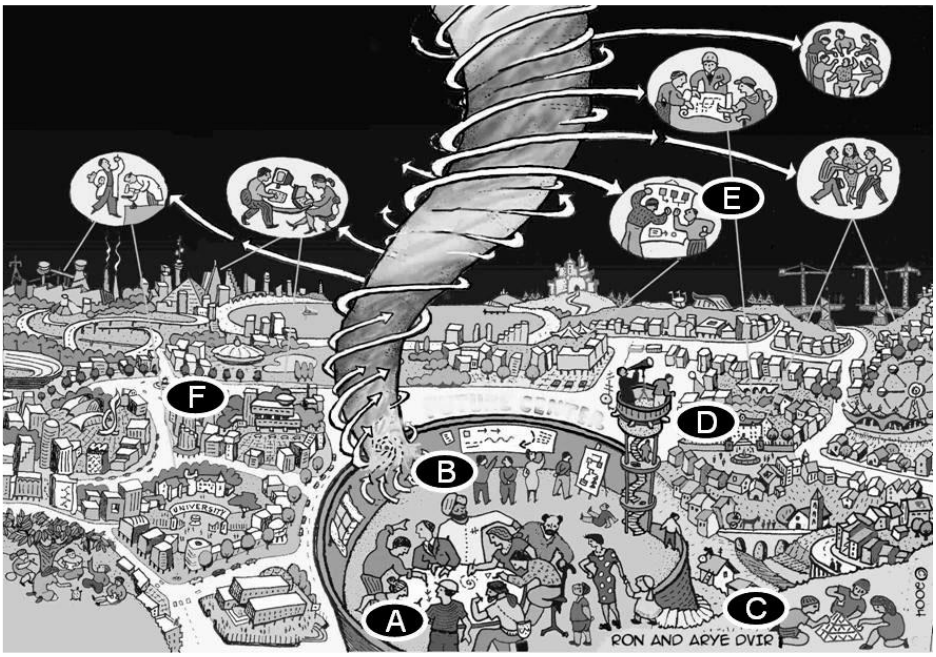

Figure 2 – Conceptual model for implementation of a regional future center (Dvir et al., 2006)

The number (A) indicates the community conversation that are core to address the future needs, challenges, trends and opportunities of the region or city. All stakeholders are involved as to represent different disciplines, ages and backgrounds. (B) refers to future images that are created from the community conversations which illustrate the possible future directions of the local and global society. (C) is the innovation laboratory where future images are translated into actual actions. They trigger invention and exploration of new concepts, methods and projects, which are experimented in this lab. (D) identifies the knowledge and intelligence center which provides the required information and tools that are useful for the other modules in order to encourage and generate future-oriented processes. Finally, (E) and (F) are the implementation projects that provide the city's inhabitants with the skills needed to handle the future and to achieve self-fulfillment. They are located in the picture both inside the future center as well as in other parts of the city to show that the realization of these programs can take place in both (Dvir et al., 2006).

2.2.3 Living Lab Research Infrastructure

An example of innovation space that is rapidly emerging in the last years is the Living Lab. This is mainly due to sustainability as being today a prerequisite for any product or service. Household consumption determines the larger part of all impacts of final consumption. There is the need to optimize the whole production-consumption system to solve future tasks and problems and this is possible only by collecting new knowledge and creating new test beds (Liedtke et. al., 2012). Living Labs represent the switch that allows to leave the current resource consumption path and undertake a new one (Baedeker et. al., 2014).

A Living Lab can be defined as "a user-centric innovation milieu built on every-day practice and research, with an approach that facilitates user influence in open and distributed innovation processes engaging all relevant partners in real-life contexts, aiming to create sustainable values" (Bergvall-Kåreborn et al., 2009, 3). It provides means to observe in the process of everyday use and it sheds light on experiences with potentially sustainable product-service-innovations in the key areas that often do not perform in the intended way (Liedtke et al. 2012).

Eco-design is a key principle for sustainable development and for economic and socio-cultural innovations. According to the European Commission (2009), an innovative design strengthens the competitive advantage of its company and of the economic system as a whole. The systematic approach of integrating all stakeholders of the value chain into the development processes requires new ecological services and adequate business models fitting the definition of eco-innovation as written in the final report of the EU Sectoral Innovation Watch Panel on eco-innovation:

"Eco-innovation means the creation of novel and competitively priced goods, processes, systems, services, and procedures that can satisfy human needs and bring quality of life to all people with a life-cycle-wide minimal use of natural resources (material including energy carriers and surface area) per unit output, and a minimal release of toxic substances" (Reid and Miedzinski, 2008).

Living Labs are crucial for fostering eco-innovations since they aim at exploring an approach that should lead to long-term effective sustainable innovations by engaging users rather than limiting them. Social innovations can be developed only by integrating emerging trend and consumer behavior (Liedtke et al. 2012).

Living lab is a combined lab/household system and this makes it unique, comprising two elements: a real home and a living laboratory. It is a research infrastructure that will be innovative since it will produce breakthrough innovations in sustainable domestic technologies using explorative, co-creation and open innovation approaches (Liedtke et al. 2012).

The living lab research agenda opens up an iterative process where the next step is the implementation of projects and research infrastructure. Then, research evaluation is necessary to analyze strengths and weaknesses that will lead again to a new research agenda, always updated and crucial in order to have successful and relevant research inside living lab (Liedtke et al. 2012). The figure below depicts the living lab research agenda **(Figure 3)**.

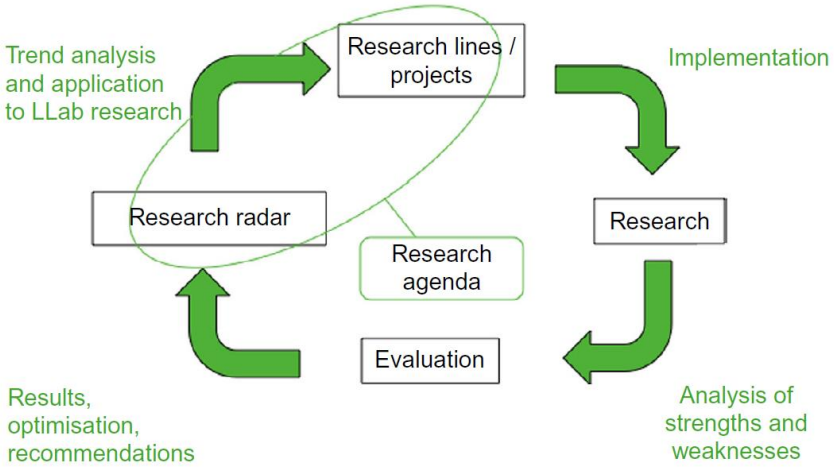

Figure 3 – The Living Lab research agenda (Liedtke et al. 2012)

2.2.4 Remote Work and Smart Working Centers

In the recent years, due to a rapid development in the field of information and communication technologies (ICTs), there has been a strong drive to transform traditional workplaces in order to allow employees to perform their work activities remotely. This means at a distance from the traditional office building and with substantial spatial-temporal flexibility in choosing where and when to carry out activities (Errichiello & Pianese, 2016).

Remote working is an example of a business transformation that works on different levels. "It serves the needs of individual employees, it provides businesses with new resilient and adaptive ways to engage with their ecosystem and deliver economic value, and it serves the larger community by addressing public health needs. With these mutually supportive returns, the rapid pivot to remote working demonstrates stakeholder capitalism in practice" (Stewart & Menon, 2020)

The term "Smart Working" corresponds to "non-conventional organizational models characterized by higher flexibility and autonomy in the choice of working spaces, time and tools, and that provides all employees of an organization with the best working conditions to accomplish their tasks" (Gastaldi, Corso, Raguseo, Neirotti, Paolucci & Martini, 2014). This flexible work arrangement can be viewed as a holistic approach in managing employees' flexibility able to overcome drawbacks

attributed to homeworking (Adamsone et al., 2013). According to Clapperton & Vanhoutte (2014), Smart Working stretches the principle of remote working emphasizing concepts like autonomy and empowerment.

In particular, "Smart Working Centers" (SWC) are considered a new form of shared and collaborative workplace where a variety of users can flexibly access and work, individually or in teams, at a distance from their organizations' office building. They do so by taking advantage of a wide range of communication and collaborations services (Errichiello & Pianese, 2016). The design of workspaces within SWC consists in open spaces with areas for collaboration, concentration, communication and relax (Adamsone et al., 2013). Smart Work Centers mark a significant shift to new work practices and can be considered a potential solution to the increasing demand for this spatial-temporal flexibility that can significantly promote a wider diffusion of remote work worldwide (Errichiello & Pianese, 2016).

Distinctive features of SWC are flexibility in access time and workspace, numerous beneficiaries, an emphasis on the human dimensions of interaction and communication, the availability of numerous and sophisticated ICT tools and a proactive role of institutional bodies that promote the realization of these spaces (Errichiello & Pianese, 2016). Potential users include professionals, entrepreneurs, small and micro-businesses and both private and public employees (Errichiello & Pianese, 2018).

Three elements constitute a SW model. The first element consists in the ICT-based solutions, especially the collaborative ones that allows the free sharing of information and ideas to have a real time update and interaction to fill in the "distance gap". Secondly, HR practices, such as change management actions like training programs, have to be introduced when a new organizational model is chosen. Lastly, an important element is the reconfiguration of the workplace and of the office layout. Indeed, it can lead to innovative ways of collaboration with others increasing the overall productivity and managing better work-life balance of employees (Gastaldi et. al, 2014).

According to Gastaldi et. al, (2014), the main reasons for which an organization decides to invest in SW can be divided as a means to achieve organizational efficiency (cost reduction and increased productivity), organizational effectiveness (establishing collaboration and innovative practices) or employees' engagement (creativity and better work-life balance).

These collaborative spaces create different economic, social and environmental benefits not only for employees and organizations but also for other stakeholders. Individual benefits include money savings, time optimization, stress reduction, increased autonomy and productivity and finally an improved work-family balance. Organizational benefits are improved performance, reduced

absenteeism, increased commitment, reduction of office costs and an expanded labor market. Finally, at a societal level, the creation of SWCs can lead to a reduction of environmental pollution, the increase of community involvement, the recovery of depressed areas and the reduction of unemployment and accidents related to home-office commuting (Errichiello & Pianese, 2016).

Moreover, SWCs can increase the propensity of managers to implement remote working in their organizations since they offer a solution for many key managerial issues in this topic. Indeed, these centers can enable effective supervision, control and communication management activities by facilitating the monitoring of distant employees. Overall, SWCs can encourage interaction, networking and promote a collaborative-oriented culture by changing employees' attitude towards intra-organizational communication (Errichiello & Pianese, 2016).

The authors Errichiello & Pianese (2018) also shed light on the positive relationship between remote working in SWCs and creativity. They assume that there is a direct influence of SWCs on workplace creativity; in particular, "specific space design and available technologies can directly affect smart workers' creativity, benefitting from interactions with others in physical and virtual environments." Moreover, they also consider that there is an indirect influence of SWCs on workplace creativity, for which "SWCs can indirectly affect smart workers' creativity by promoting a culture of openness and a climate of collaboration, ensuring physical and cognitive proximity, enhancing workers' autonomy and informal managerial styles" (Errichiello & Pianese, 2018).

2.3 Spheres of Innovation Spaces

As will be explained in further depth in the methodology chapter, the data collection was carried out following an iterative approach. This means that the literature review of the theoretical framework went in parallel along with the data collection from the semi-structured interviews. The data collected from the latter was categorized in three themes/spheres that are *Mind-set & Human Interaction*, *Impact on Society & Sustainability* and *Innovation & Technology*. In the following paragraphs, a brief description of the spheres of Innovation Spaces based on existing literature is presented. These represent the main areas in which the impact of Innovation Spaces can be observed. They differ from the dimensions of Innovation Spaces (paragraph 2.1.3) in the sense that they are not characteristics or features that are valid for all spaces, but rather represent some areas of impact where each Innovation Spaces has a unique and diverse influence.

2.3.1 Mind-set & Human Interaction

Many experiences and emotions are associated to space (Baldassare 1978). Any kind of innovation activity is built at its core on epistemological and cognitive processes. They are the basis for any social processes and interaction and for organizations dynamics (Peschl & Fundneider 2012).

The value that lies behind an approach to innovation is the enabling approach. It consists in acquiring virtues of openness, being able to reflect and to radically question ourselves. Moreover, it also includes learning to listen, closely observing and letting things change us and impress us. This means that it is essential to provide an ecosystem and environment of cultivation, facilitating and that enables innovation. Environmental structures thus become part of the knowledge creation process. (Peschl & Fundneider 2012).

In this context, the concept of "Enabling Spaces" appears to be relevant. According to Peschl & Fundneider (2012), it is generally conceived as a "space supporting, enabling, and facilitating processes of innovation and knowledge creation." The foundation of this space can be traced back on the concept of "ba", that is "a continuously created generative mechanism that explains the potentialities and tendencies that either hinder or stimulate knowledge creative activities (…) The knowledge-creating process is necessarily context-specific in terms of time, space, and relationship with others. Knowledge cannot be created in vacuum, and needs a place where information is given meaning through interpretation to become knowledge (…) Ba is an existential place where participants share their contexts and create new meanings through interactions" (Nonaka, Toyama, 2003: p. 6f). One key insight in the process of "enabling space approach to innovation" is that almost

any innovation process that intends to encourage the creation of innovation should start by observing, investigating and deeply understanding the object of innovation and its systemic environment (Peschl & Fundneider 2012).

Moreover, a key factor to achieve the right interaction and collaboration is facilitation. Indeed, an effective facilitation in group problem-solving may lead to group productivity and effectiveness (Offner, Kramer & Winter, 1996). They are responsible for tailoring sessions to the needs of the clients but their responsibility varies from center to center. They appeared to be "central to manage the moods and motivation of group members and steer discussions in the right direction in such complex and stimulating environment" (Magadley & Birdi 2009). Indeed, it is perceived as the most important element in ensuring the effectiveness of centers (Lewis & Moultrie, 2005).

2.3.2 Impact on Society and Sustainability

There are many definitions and interpretations of sustainable development. It is commonly presented as the pathway that leads to all that is good and desirable in society. However, the comprehensiveness and complexity if this interpretation render the term no longer useful in guiding policymaking and the danger of irrelevancy is triggering. (Holden, Linnerud, Banister 2014). The Brundtland commission in 1987 with the report "Our Common Future" of the World Commission on Environment and Development produced the first official definition of sustainable development. It referred to sustainable development as the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" and recognized the three spheres of economic, social and environmental sustainability (Brundtland, 1987). The dominant perspective of today separates these three sectors and views the environment as detached from humanity and its actions (Hopwood, Mellor & O'Brien 2005).

Sustainability is today a prerequisite for any product or service. We face the challenge to find new solutions and strategies to solve future challenges. The only way to achieve a sustainable competitive advantage is by creating spaces that will foster the right conditions to develop new ideas and innovations (Liedtke et. al., 2012), (Lawson & Samson, 2001).

Indeed, place is considered an essential aspect in shaping social identity, identification and cohesion. Design can be intended as a process to achieve change, embodying activism as a form of shifting to new paradigms and values. In particular, social design can support social innovations to foster social change towards sustainability (Calvo and De Rosa, 2017). It can also encourage achieving creative solutions beyond unconventional structures through a strategic and systemic approach (Mulgan,

2014). The focus is on social demands rather than on the market. Design is thus motivated by the environmental impact upon people's actions within co-design processes. Indeed, design activism can play a key role in enabling social change and in arising awareness about communal values and beliefs. The current context asks for the proactive involvement of people in community and interpersonal relationships are strongly connected to the development of the sense of community (Calvo and De Rosa, 2017).

In this context, the idea of co-design appears to be relevant and it consists in the approach of integrating people from different backgrounds and levels of expertise into the creative process (Sanders & Stappers, 2008). A key aspect of co-design is the process itself rather than the final outcome since "it provides inspiration to the design team for the development of concepts and innovations" (Calvo and De Rosa, 2017).

The design of community spaces through collaborative actions and the direct involvement of citizens contributes to the process of reinforcing the long-term relationship "between people and places." Moreover, the use of co-design becomes a "vehicle to engage citizenship towards the transformation of our environment (…) before a creative process starts, an individual needs to interact with a stimulating environment" (Calvo and De Rosa, 2017). "People make places, more than places make people" (Worpole & Knox, 2007, p.2).

2.3.3 Innovation and Technology

As mentioned earlier, in today's economy, innovation is always more generated in the form of open innovation. It involves opening up to external resources for the scope of fueling the innovation funnel within the company blurring the boundaries between the firm and the external environment (Chesbrough, 2003). More and more companies conceive the model of open innovation, made up of experiments and out-sourcing, as their path towards growth. They undersee its potential to keep up with the pace of competition in an uncertain and dynamic marketplace (Pancholi, Yigitcanlar & Guaralda 2014). The emphasis is not on the sole creator of technology but to the "orchestrator organizing the innovative bits from outside world to connect them with the internal bits affects the shaping up of social, cultural, and built environment (…) that nurture creativity and innovation (Pancholi, Yigitcanlar & Guaralda 2014). The figure below **(Figure 4)** depicts the open innovation model.

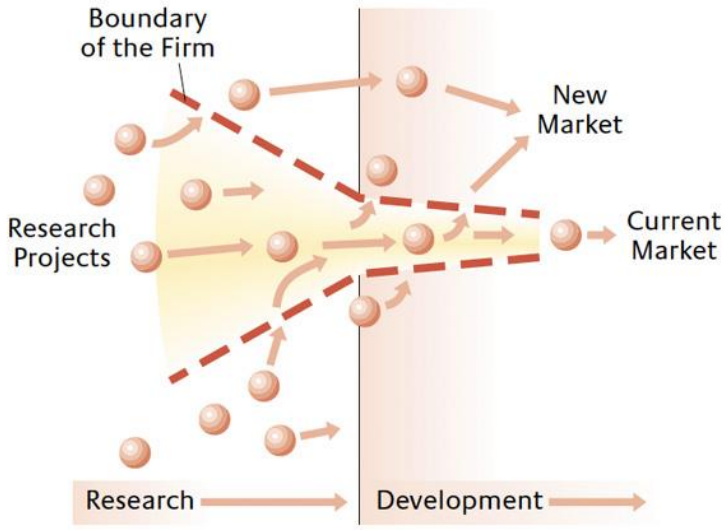

Figure 4 – The open innovation model (Chesbrough, 2003)

The new model of open innovation allows a company to commercialize internal as well as external ideas by deploying in-house and outside pathways to the market. The boundary between the company and its surrounding is represented by a dashed line, enabling innovation to move more easily between the two. Many companies have been defining new strategies for exploiting the principles of open innovation (Chesbrough, 2003).

Technology is one of the main sources and drivers of innovation, providing the "mechanism" that allows the functioning of the system (Arthur, 2007). It has acquired a pervasive and dominant role in Innovation Spaces. It is influencing office behavior and altering patterns of work rendering them less predictable. Indeed, technology has the potential to connect people across substantial distances allowing new forms of face-to-face communication. This has increased the mobility of workers from different locations that can be distant and at the same time still be continuously "plugged in" (Wagner & Watch, 2017).

However, despite the increasingly dominant role of technology, the total effectiveness can be achieved only with the strong consideration of facilitators. They are an integral part of the spaces and play a crucial role in achieving the pre-set goals by knowing and demonstrating how to utilize technologies. Indeed, with the presence of "cutting edge technologies", there is the risk to overlook the human role. Thus, a combination between technology and traditional modes appears to be the best strategy applicable (Magadley & Birdi 2009).

2.4 Summary Theoretical Framework

With the aim of rendering the reading process easy and clear to follow and to guide the reader towards the empirical findings of the study, a summary of the theoretical framework is provided. The main points are depicted in this paragraph.

The theoretical framework was divided in three main parts. The first part aimed at understanding what Innovation Spaces are by understanding its relationship with creativity and by analyzing the main dimensions. Indeed, Innovation Spaces are open, flexible and contextually responsive environments. They aim at strengthening interactions, communication and collaboration, opening up new ways of sharing and expressing new ideas. They represent an important part of the innovation process of an organization and indeed, they reinforce innovation performance and corporate values of that organization. Moreover, much literature found that having dedicated spaces for innovation can increase the ability to generate ideas and can facilitate the creative process. In addition, some dimensions of Innovation Spaces that support the innovative process are the following: *Collaboration and Communication Enabling spaces, Modifiable space, Intellectual spaces, Attracting spaces and Value reflecting spaces.*

In the second part, the four different types of Innovation Spaces that appeared more relevant for the study were descried in detail. *Innovation laboratories* are purpose-built physical environments with collaborative workspaces in which groups of employees can engage with each other in order to explore and extend their creative thinking beyond and above normal boundaries. *Future centers* are considered an urban innovation engine of the city and aim at facilitating the working environment and helping organizations prepare for the future in a proactive way. The *Living lab research infrastructure* is a user-centric innovation environment built on every-day practice and research which goal is to create sustainable value. They are crucial for fostering eco-innovations since they aim at exploring an approach that should lead to long-term effective sustainable innovations by engaging users rather than limiting them. *Smart Working Centers* consist in shared and collaborative workplace where a variety of users can flexibly access and work, individually or in teams, at a distance from their organizations' office building.

In the last part of the theoretical framework, the three main spheres of Innovation Spaces have been presented, analyzing the impact that the spaces have in each. The first sphere is the *Mind-set & Human Interaction* that focuses on the role of people. The are two key issues in this sphere. The first is the enabling approach, consisting in acquiring virtues of openness, the ability to radically question ourselves, learning to listen, closely observe and let things change us and impress us. The second issue lies in the importance of facilitation as the key factor to achieve the right interaction and

collaborations that ensure the effectiveness of Innovation Spaces. The second sphere is the *Impact on Society & Sustainability*, which regards the relationship with the external environment. Sustainability is a prerequisite for any product or service and "place" is considered an essential aspect in shaping social identity, identification and cohesion. The last sphere of *Innovation & Technology* regards two pillars; the model of open innovation developed by Chesbrough that considers both inflows and outflows of knowledge in the innovation funnel, and the idea that technology is always more pervasive and dominant inside Innovation Spaces.

In the following table **(table 1),** a summary of the theoretical framework is presented.

What are Innovation Spaces

- Open, flexible and contextually responsive environments which aim at strengthening communication and collaboration and reinforcing innovation performance and corporate values of that organization
- Increase the ability to generate ideas and can facilitate the creative process
- Dimensions of Innovation Spaces also support innovative activities

Types of Innovation Spaces

- Innovation Laboratories
- Future centers
- Living Lab Research Infrastrucuture
- Smart Working Centers

Spheres of Innovation Spaces

- *Mind-set & Human Interaction*
  - Enabling approach and facilitation process
- *Impact on Society & Sustainability*
  - Sustainability as a prerequisite and place to shape social identity
- *Innovation & Technology*
  - Open innovation and pervasiveness of technology

Table 1 – Summary of Theoretical Framework. Source: Produced by the author

3. Methodology

This chapter will present an overview of how the study has been conducted, including the methods chosen to conduct the research, the reasoning behind the choice and the advantages and disadvantages that are entailed. First, the research strategy will be presented, followed by the research design and then the method for data collection and analysis is explained. Lastly, a discussion on the quality of the research is presented.

3.1 Research Strategy

The main objective of this research is to understand role of Innovation Spaces and observe how they contribute in shaping today's dynamic environment. Thus, the focus is on understanding how the spaces selected for the study operate within the ecosystem, what is the role of people inside and the impact on the society. Moreover, a further aim is to understand how smart working has affected innovative process that took place in Innovation Spaces.

A research strategy design presents the steps that will be taken to conduct the research in the business context that is a general orientation to the conduct of the research (Bryman & Bell, 2011).

The first step consists in defining whether a deductive or inductive approach should be taken. A deductive approach consists in building a theoretical framework that is used as the foundation for the collection and analysis of empirical findings. Instead, the inductive approach seeks to create a theory based on empirical findings that are not anchored to a theoretical framework (Bryman & Bell, 2011).

Given that the research has an *exploratory* nature, meaning that it aims at finding knowledge in areas relatively unfamiliar, an *inductive* approach seems more appropriate. Rather than testing existing theories through deducing hypothesis, the aim is to observe new phenomena and draw conclusions. Thus, the process is the opposite: from the findings, new theory is created. Moreover, it would have been difficult to apply the deductive approach since there is not much research already present around this topic. However, it is worth noticing that the inductive approach could imply some limitations, such as the risk of developing no clear and significant theory (Bryman & Bell, 2011).

Moreover, when choosing what kind of research strategy to conduct, two are the main paths: qualitative or quantitative method. The choice depends on the research questions set for the study and the overall aim (Bryman & Bell, 2011). In the case of this study, a *qualitative* research method seems more appropriate to answer the research question. Differently from a quantitative, the focus is on

words and on informal social relationships. It allows having a more profound understanding on a specific topic that is based on real-life settings. Moreover, it implies viewing the world from different perspectives and thus, requires much interpretation of data (Bryman & Bell, 2011). This study implies understanding the role of Innovation Spaces that comprehends people, culture, innovative practices and societal challenges entailed. Thus, a qualitative approach focusing on words is more suited.

The benefits of using this method stand in the flexibility entailed to explore such specific context and in the possibility to closely observe respondents and capture subjective opinions. Since the focus will be much on perceptions and human behavior, much subjectivity is included. This may represent a double-edged weapon resulting in possible inconsistencies in the research (Bryman & Bell, 2011). My scope will be that of applying reliable analysis tools and minimize potential bias. Moreover, a further critical aspect that has to be taken into consideration is that qualitative research is not simple to replicate and results cannot be generalized. (Bryman & Bell, 2011). However, since the aim of this research is to gain insight on the topic rather than developing general theory, this aspect was not considered an issue.

3.2 Research Design

Bryman and Bell (2011) refer to research design as the framework that will guide the process of collecting and analyzing data during a research. The choice of research design included two main considerations: the exploratory approach and the multiple case study.

An exploratory case study approach is suited for this kind of study that seeks to find links and connections between existing theory and a multiple case studies. It is an approach mostly used in studies that deal with a rather emerging topic for which not enough knowledge already exists (Bryman & Bell, 2011). Since there has been a great deal of attention towards Innovation Spaces only in recent years, there is not sufficient pre-existing literature.

The authors recognize five different types of research designs: experimental design, cross-sectional design, longitudinal design, case study design and comparative design (Bryman & Bell, 2011). To frame this kind of inductive qualitative research, the case study design seems more suited. It allows for in-depth investigation into a complex context through a detailed and intensive analysis. Moreover, it is often chosen in business research when there is a qualitative type of study and with a high degree of complexity (Bryman & Bell, 2011).

Benefits of a case study approach are several. Indeed, applying this approach often favors qualitative research methods through a strong participant observation and interviews (Bryman & Bell, 2011). In

particular, a multiple case study will be adopted to compare different findings and link insights across different cases of the same investigated topic. This involves the comparison among various cases that eventually will allow a rather clear identification of common patterns (Yin, 2011). Moreover, the case study approach is suited in research that seeks to answer questions with "why" and "how" (Yin, 2011). Considering the research questions of this study intended to truly understand the complex mechanism that lies behind Innovation Spaces, the approach appears particularly appropriate.

For what regards the multiple case study, the criteria adopted for the selection of respondents will be presented in detail in the following paragraph (3.3.2.2).

3.3 Research Method and Data Collection

Data collection represents one of the crucial parts of the research and consists in the process of collecting and analyzing data for the purpose of the research question (Bryman & Bell, 2011). The research contains two different sources of data, a primary and a secondary data collection, which are presented in this section. The initial data was collected though a narrative literature review, which represents the basis to understand the focus of the primary data collection, such as semi-structured interviews.

The data collection followed an *iterative process*. It started with the secondary data collection of literature review, followed by a first round of data collected through interviews, then a further literature review took place and a final round of interviews terminated the data collection process.

3.3.1 Secondary Data Collection: Literature Review

Different approaches can be chosen in order to review the literature. Bryman & Bell (2011) distinguish between a systematic literature review, a detailed plan to be followed in order to reduce the bias of the researcher through a thorough analysis of existing literature, and a narrative review, which goal is to obtain a general idea of the topic that needs to be explored. For this qualitative research, a narrative method seems more suited since it meets the need for flexibility to change the scope and boundaries of the study as the process goes along. (Bryman & Bell, 2011).

The secondary data collection was carried out as a first step in order to gain more knowledge on the subject before proceeding with the primary data collection phase. The aim was to provide a comprehensive theoretical background concerning the topic of the master thesis. The main focus was the creation of Innovation Spaces, their characteristics and dimensions as well as the relationship

between innovation space and creativity. Furthermore, different types of Innovation Spaces were analyzed, respectively Innovation Laboratories, Future Centers, Living Labs and smart working centers. After sufficient information was collected, the first round of primary data collection, such as semi-structured interviews, was conducted. Some interesting issues emerged that needed further investigation through more literature review. This gave rise to a second literature review with a particular focus on the issues emerged, such as the three spheres of Innovation Spaces: *Mind-set & Human Interaction, Impact on Society & Sustainability* and *Innovation & Technology*.

Relevant existing literature consist in academic papers, journal articles, reports, magazine articles and books. The main databases consulted for the research are Scopus, Web of Science, Google Scholar as well as on-line libraries of the University of Gothenburg and LUISS University. Given the huge amount of information provided by these search engines, all inputs were critically analyzed so to keep only reliable results. Indeed, a particular attention was given to the presence of peer-reviewed source, the number of citations and the most recent year of publish. Moreover, the keywords used for the study have been: *Innovation Spaces, organizational creativity, dimensions of Innovation Spaces, innovation capability, innovation laboratory, participatory processes, design of physical spaces, social innovation, sustainable design, living lab*. More keywords have been added at a later stage. These include s*mart working, remote working, Smart Work Centers, social distancing, facilitation, interaction, collaboration, society, sustainability, innovation, technology.*

Other than databases, other sources were selected using the so-called snowball effect. This consists in the use of references and citations of relevant papers found as additional sources to gather data.

Overall, the secondary data collection has been essential for the researcher in the data analysis process to compare and relate the information collected through interviews with relevant existing literature.

3.3.2 Primary Data Collection: Semi-structured Interviews

The primary source of data in this study will be semi-structured interviews. Indeed, the study extensively relies on primary data that is collected through interviews and presented in the empirical findings chapter (chapter 4), further analyzed in the data analysis chapter (chapter 5). They allow extracting the desired detailed information regarding the respondents' view following a flexible interview guide. Interviews are the most suitable option for exploratory nature since the scope is to understating the respondents' opinion through their eyes. Moreover, the choice of selecting semi-structured interviews lies in the fact that these represent a good middle point between focus and flexibility (Bryman & Bell, 2011).

In particular, for this type of multiple case study where more interviewees are selected, having a pre-set structure of questions will allow easy comparison between them. In addition, the interview guide allows to be sure to cover some specific topics. At the same time, semi-structured interviews expect to remain flexible and go ahead with follow-ups on topics that require more attention (Bryman & Bell, 2011).

Structured or completely unstructured interviews could represent substitutes, as well as shifting to other kind of data used in case studies, such as internal documents or actual observations by participating in meetings. However, semi-structured interviews appear to be the most suited to this kind of explorative study for the reason stated above.

Some negative aspects of semi-structured interviews lie in the fact that this process entails a degree of subjectivity that is interpreting the data collected (Bryman & Bell, 2011). Thus, a careful data analysis will have to be carried out. There will be particular attention in this process in order to minimize every possible bias in observing data.

3.3.2.1 Interview Process

Due to the critical pandemic situation during which the thesis was written, all interviews were made through Microsoft Teams, Skype or Zoom. Probably not having the possibility to meet face to face with the interviews represents a limit to the possible interpretations that take place through a computer screen. However, all information gathered is complete and all interviews appeared to be useful for the sake of the study.

Before the actual interviews, the questions were sent to the respondents so that they were available before hand and the answers would not be out of focus. This appeared to be useful since respondents knew what to expect. The questions then were not strictly followed and when it was necessary, a follow-up question would be made. All interviews took place in quiet environments where no distractions arose. The interviews were then recorded after the authorization to do so was given and during the interview, some notes of the most important parts were taken so to keep track of the answers and have some insights for further questions. Then all interviews were transcribed manually. Although it was a time consuming process, it was a necessary activity in order to fully understand the answers and to minimize possible misunderstandings and lost information. Moreover, it rendered the data analysis process easier since it allowed for a simpler comparison across data and to finally have a comprehensive view of the overall data. In cases of interviews carried out in languages other than

English, such as Italian, they were then carefully translated to English. All transcribed interviews were then sent back to the respondents via email so that they could read through and spot any part that needed to be edited or modified.

The interview process was an iterative activity together with the literature review. The first round of interview data collection gave insight for further secondary data collection, and this iterative went on until a last round of interviews. In particular, a follow-up via email was made to the respondents of the first round (see appendix 2).

3.3.2.2 Selection of Respondents

The research study draws upon a purposive sampling since the participants were selected considering their ability to provide knowledge in order to address the research questions. It is a non-probability technique that appears to be suitable for qualitative studies (Bryman & Bell, 2011). Although it does not allow for generalization of the findings, it still appears the most suited sampling method, since, as stated earlier; generalization is not the scope of the thesis. Nonetheless, the aim of the research is to explore the role of Innovation Spaces and the impact they have in today's innovative business environment. Although purposive sampling can happen to be biased, it is still considered the most appropriate for this kind of study since it enables to select respondents based on the specific information required (Etikan, Musa & Alkassim, 2016). Moreover, the reliability of the respondents has been evaluated and to ensure a high quality and trustworthiness of the findings.

As the project was carried out in collaboration with First to Know Scandinavia (FTK), Swedish consulting company, the sample was chosen by the researcher taking into consideration FTK's network. Indeed, the company supported and assisted the researcher in identifying potential respondents that would be relevant for the case of the sample. FTK played a bridge role between the researcher and most of the experts. All respondents had a profound experience in the field of Innovation Spaces, ranging from Innovation Labs to Future Centers to Innovation Hubs. All had a particular knowledge regarding the role of these spaces and the opportunities, challenges and innovative activities that these spaces entail and this could lead to fruitful discussions. The extensive experience in the field allowed for the author to have insightful sources from which to draw conclusions and to link one another.

In the table below **(Table 2)**, the respondents are presented in chronological order. They have experience with a particular type of Innovation Space. In particular, the first two respondents (Paolo

Martinez and Leif Edvinsson) have been both involved in the creation of a Future Center. They were both intended to be agile, prototyping spaces that dealt, in different ways with complex challenges. The third respondent (Paolo Merialdo) took care in creating an Innovation Lab (InnovAction Lab). This is a space where students could network, train and develop entrepreneurial skills to eventually prototype a business idea. The fourth respondent (Niclas Ingeström) was the only one to be related to a virtual Innovation Space of Castellum. This was a very interesting and unique point of view compared to the other respondents. Lastly in the first round of interviews, the fifth respondent (Magnus Björsne) dealt with an Innovation Hub (BioVentureHub) that had the scope to gather SMEs and share the human capital and infrastructure of AstraZeneca.

Two are the aspects that deserve to be mentioned. First, what renders the interview sample suited for this study is the uniqueness of each Innovation Spaces to which the respondents refer to and at the same time the commonalities that can be identified. Indeed, as will be observed in detail in the data analysis, each space has specific goals and processes but some common traits resulted from each interview. Secondly, since the study was carried out in two countries and with supervisors from two different university (University of Gothenburg and LUISS University of Rome), it seemed relevant to consider the reality of Innovation Spaces in both countries. Thus, the scope was to select respondents that could depict the situation with a broader scope for Italy and Sweden. However, time limits and the choice of a qualitative study allow for a limited comparison between these two realities.

Case company	Nationality	Interviewee	Role	Date	Method	Length
Futour	Italian	Paolo Martinez	Partner & Facilitator	10/3/2020	Skype	40 min
Skandia FutureCenter	Swedish	Leif Edvinsson	Founder & Skandia Vice President	19/3/2020	Skype	52 min
InnovAction Lab	Italian	Paolo Merialdo	Founder & Director	24/3/2020	Skype	51 min
Castellum	Swedish	Niclas Ingeström	Chief Digital Officer	30/3/2020	Microsoft Teams	25 min
BioVentureHub (AstraZeneca)	Swedish	Magnus Björsne	CEO	30/3/2020	Microsoft Teams	45 min
Learning Lab (Akademiska Hus)	Swedish	Jonaz Björk	Digital Scenographer	28/4/2020	Zoom	57 min

Table 2 – Sample of interview respondents. Source: Produced by the author

3.3.2.3 Interview guide

The first approach used to contact the respondents has been through email or through Linkedin messages (Appendix 3). The text was purposively short and direct so to quickly engage the respondents. The main information was presented, such as the topic of the research and the field of study.

An interview guide's purpose is to be helpful in guiding the interview presenting the topics and issues that will be addressed. It is prepared so to assure that specific topics are covered and at the same time it allows for flexibility (Bryman & Bell, 2011).

The interview guide remained the same for all interviews so to allow comparability, but was adapted to each interview's need. Specifically, during the interview, different follow-ups were made regarding topics of interest in order to acquire a deeper knowledge on areas of interest. There were two rounds of questions for each respondent, the first made via Skype/Microsoft Teams/Zoom and the second through written mail. The reason behind a double interview to the same respondents was for the topic behind. Indeed, the first round had the objective to understand the role of different types of Innovation Spaces, including future centers, living labs and innovation laboratories, and to analyze their potential to change current practices by fostering the co-creation of radical and sustainable innovations. The need for a second round of interviews emerged from the forced smart working due to COVID-19 and a resulting secondary research question. It appeared to be relevant in this situation to understand the impact of remote/smart working on innovative practices that took place inside spaces built ad-hoc and around physical proximity.

The first interview guide was structured following five main parts, as can be observed in Appendix 1, which are Introduction; specific Innovation Space; Role of Innovation Spaces in general; Impact on Society; Conclusion. The first part of the introduction was intended to get to know the respondent and to have a broad focus on the topic at hand. The second part regarded the particular innovation space that the respondent had experience with. The goal was to understand the process of creation, together with the opportunities and challenges implied. The third part aimed at getting an overall depiction of the role of Innovation Spaces and their characteristics, narrowing down the issue to the role of facilitators and technology. The fourth part took in consideration the impact on society assessing whether the space could be considered a supporter in finding sustainable solutions. Lastly, the conclusive part of the interview consisted in a question with a futuristic view of the innovation space, as to see aspirations and hopes for the future, and a last question intended to collect an opinion of each respondent about what innovation is.

The second round of interviews took place, for the majority of the respondents, through written email since the information needed was not excessive and for time advantage reasons (see Appendix 2). Firstly, a definition of Smart Working was provided so that all respondents had a common parameter to which to refer. Then, the questions were presented and for sake of simplicity were divided with a focus on smart working before Covid-19 (Past), during (Present) and after (Future). This was made in order to set a structure that respondents could follow in answering and to depict a broad picture on the topic. Four out of six respondents answered to the follow-up questions, one via Zoom, one with a phone call, and the remaining two by written mail. The quantity of information was deemed insufficient to proceed with the same analysis as the data from the first round of interviews. However, since the aim of this second round of interviews was to answer the secondary research question, so of minor importance for the sake of the study, it did not constitute an issue for the conduction of the research.

3.4 Data Analysis

Once data is collected, it is then a critical process to analyze it. As the research entails a qualitative method, thematic analysis appears to be a very useful and common method, especially for what regards interview data. Moreover, it appears to be a rather flexible method and less time-consuming compared to others suggested for qualitative analysis (Bryman & Bell, 2011).

Thematic analysis allows identifying patterns of themes across data and focus on the relevant parts. The aim is to find similar patterns across interviews (first order concepts), group them into major *themes* and then aggregate them in turn into Aggregate Constructs. Once this process is made, then it should be much simpler to draw major conclusions and link them to an exploratory theory. The steps consist in firstly familiarizing with data, and this is easily achievable through the transcription of the interviews, then the second step is a long process of coding the interviews according to similar content. The next part is to compare these codes in order to find similar *themes* and the last step is to group them again and name them accordingly (Bryman & Bell, 2011).

For what regards the first round of data collection, the thematic analysis approach was applied and adapted to the needs of the master thesis, elaborating an Aspect-Thematic Analysis. This means that the first three steps, such as transcription, coding, and *theme* identification, took place. Indeed, after having transcribed the interviews, the data was manually color-coded based on similar content. These codes were then grouped together into themes that are *Mind-set & Human Interaction*, *Impact on Society & Sustainability* and *Innovation & Technology*. It is important to notice that these three

themes are also the spheres that have then been described in the theoretical framework. In Chapter 4 (Empirical Findings), these three themes are presented and reported for each case company. Since the author did not consider it essential for the sake of the analysis to group these themes into Aggregate Constructs, the three themes were carefully analyzed into their main "aspects" that are reported in Chapter 5 (Data Analysis). In particular, the "aspects" are those main points that emerged from the analysis of each theme/sphere and were mainly touched by the respondents. They have been identified by observing in depth each theme. Moreover, in this chapter, the primary interview data was put in relation to the secondary data, such as the theoretical framework.

One critical aspect in thematic analysis of interview data is the risk of missing important parts due to the long lengths of the data. In addition, the challenge to remain unbiased while going through data has to be monitored (Bryman & Bell, 2011). Of course, as every qualitative analysis, the interpretation of data is a subjective process. This means that each author will adopt its own key and lenses to read the data and it is implied in this type of study. However, the utility of this rigorous analysis allowed carefully comprehending in depth each part of the data, without leaving out important information. The meticulous manual transcription and color-coding appeared to be useful to familiarize with the data, and allowed the subsequent steps to smoothly follow.

The figure below **(Figure 5)** describes the process of data analysis, outlined into the five main steps.

Figure 5 – Aspect-Thematic analysis process. Source: Produced by the author

For what regards the second round of data collection to address the secondary research question on the topic of remote/smart working, the data analysis process followed a different approach. Due to limited amount of data collected, it was impracticable to apply the same analysis method. Moreover, for the sake of a secondary research question, it also appeared not so relevant for the sake of the research. Thus, the data was collected, interpreted and used then in the conclusions to answer the secondary research question (Chapter 6 – paragraph 6.2).

3.5 Research Quality

When evaluating the quality of a social science research study, the most commonly adopted method is using the three dimensions of reliability, replicability and validity (Bryman & Bell, 2011). The authors Bryman & Bell (2011) respectively refer to these criteria as the evaluation of the reproducibility of the research and consistency of the measures adopted (reliability), the replicability of the research by following in detail the explanation of all the procedures (replicability) and lastly the rightness of the conclusions built though the research process (validity). However, these dimensions appear to be more suitable for a quality assessment of a quantitative research, rather than a qualitative one. Indeed, according to Thornhill et al. (2012), these criteria cannot be applied to exploratory studies. Lincoln & Guba (1895) have suggested an alternative method to evaluate a qualitative study. The criteria used are authenticity and trustworthiness, where the latter can be divided in four categories, namely credibility, transferability, dependability and confirmability. As noticed by different scholars (Bryman & Bell, 2011), (Lincoln & Guba 1895), (Guba & Lincoln, 1994), this last criteria seem more suited for a qualitative and exploratory research and thus, will be adopted to evaluate the quality of this study.

3.5.1 Authenticity

Authenticity refers to the researcher's ability to demonstrate a range of different realities in a fair and complete way and that overall the research conducted was plausible (Connelly, 2016). It can be assessed through five different criteria that include Fairness, Ontological authenticity, Educative authenticity, Catalytic authenticity and Tactical authenticity (Bryman & Bell, 2011). For the purpose of the study, these will not be analyzed in depth. The authenticity of this study can be observed in the fairness of semi-structured interviews. Indeed, respondents were selected in order to provide heterogeneity of Innovation Spaces and different positions inside these providing diverse perspectives.

3.5.2 Trustworthiness

Trustworthiness is composed of four different sub-criteria, which correspond and replace those used most commonly in quantitative research.

Credibility corresponds to internal validity and can be ensured by performing research according to good practice, using criteria that are commonly applied in qualitative studies. It refers to the degree to which the conclusions drawn are credible. (Bryman & Bell, 2011). All the relevant steps in

qualitative research have been followed. Additionally some particular considerations to ensure the credibility of the study were taken. These include a scrupulous and thorough literature review has taken place to have an overall knowledge of the topic at hand. Moreover, the interview guides allowed to have clear expectations from the interview for both the researcher and the respondent. Indeed, if interviewees preferred so, the questions were sent in advance. Moreover, the topic of the discussion was always presented at the beginning of the interview together with a brief introduction of the researcher. The interviews were then carefully transcribed and translated in the case of interviews in Italian. The transcription was then sent back to the interviewees so to avoid possible misinterpretations and misconceptions and allow for editing or modifications.

Transferability is the second criterion and is referred to external validity in quantitative research. It concerns to what extent the findings of a study are generalizable independently from the context in which it is done and can therefore apply to other contexts (Bryman & Bell, 2011). However, differently from quantitative study that aim at applying the findings to a broader population, transferability in qualitative studies presents some limitations since findings often appear to be oriented to the unique context to which the study refers (Lincoln & Guba 1895). To meet this criterion, the researcher has chosen to adopt a multiple case study that allows to consider different types of Innovation Spaces and to draw relevant conclusions that could apply to all. Moreover, all information regarding the case selection, the respondents, the context and the gathered data was presented in order to allow the reader to have a clear picture of the study. However, it is important to remember that generalizability is not inside the narrow scope of the research, and thus transferability does not represent an issue.

Dependability replaces the quantitative criteria of reliability of the findings. It regards the consistency over time of the data and conditions of a study together with the application of an "auditing" approach to ensure that complete records of all the phases of the research process have been kept (Lincoln & Guba 1895). To fulfil this criterion, a detailed description of the method chosen and used to collect and analyze data has been presented. Each step has been explained during the phases of the research. In addition, the transcribed interviews allow for a complete transparency of the research conducted and thus, increase the dependability of the study.

Confirmability is the last criterion presented by Lincoln & Guba (1895), and replaces the quantitative dimension of objectivity. It concerns the good faith of the researcher while conducting the research and the ability to exclude personal values and judgement during the interpretation of data (Bryman & Bell, 2011). It is important to notice that a qualitative research always implies a degree of subjectivity. Nonetheless, the researcher attempted to maintain the highest degree possible of objectivity. Indeed,

the construction of the interview guide followed an in-depth literature review, and no leading questions were implied. This means that enough space was left for the respondents to express their own point of view without being affected by the researchers' one. Moreover, as stated before, all interview transcripts were double-checked so to avoid potential bias in the collection and analysis of data.

3.6 Reflections

The research was conducted during a very critical pandemic situation due to the spread of COVID-19. This has substantially influenced and limited the data collection process. There were two main implying complications. Firstly, the time span between the first contact with respondents and the actual interview was quite long. Indeed, the transition to remote working made email inboxes more full and thus, resulting in late replies. Moreover, the initial plan to conduct face-to-face interviews obviously had to switch to virtual interviews via Skype/Zoom/Microsoft Teams. This was a time advantage but also a higher risk of bias and misinterpretation.

Although the underlying difficulties with the data collection process, fortunately, the explorative nature of the study allowed adopting a flexible and adaptable approach. The research was carried on in an iterative manner that permitted steering the study towards directions that seemed more suitable. Moreover, the subject of the study, such as Innovation Spaces, appeared to be very relevant in this current attempt of coexistence with remote working and smart working. Therefore, a new viewpoint for the research question was taken in consideration.

4. Empirical Findings

This chapter will present the empirical findings gathered from the primary data collection of interviews with respondents. The data collection will be reported following a respondent order and then divided into 3 themes: Mind-set & Human Interaction, Impact on Society & Sustainability, Innovation & Technology. All the empirical findings are proceeded by a small company description. Finally, a summary table will be provided.

4.1 Futour

Futour is a design and innovation consulting firm that helps people and public and private organizations grow, innovate, change, develop capabilities and co-create the future. It is a particular type of future center that uses human centered designed approaches through which current challenging problems are faced and transformed into creative ideas and solutions. It has involved over the years hundreds of thousands of key stakeholders. (Futour, 2020, *Futour is,* on-line website). It was initially created as a spinoff, so a start-up company in Spain and then it became a start-up in Italy at the end of 2008 with its headquarter located in Pisa (Martinez P., personal communication, 2020).

The company is specialized in rapid prototyping of future products, processes and services as well as problem solving and decision-making. It is the first global mobile and nomad Future Center that facilitates people and organizations with an extensive network of consultants and facilitators as well as with participatory workshops. Moreover, Futour's approach integrates aspects of innovative methodology to solve problems, relations that promote interaction and collaboration, consulting for dedicated Innovation Spaces and technologies supporting co-creative innovation workshops (Futour, 2020, *Futour is,* on-line website).

4.1.1 Mind-set & Human Interaction

From the interview with Paolo Martinez, two important points emerged regarding the mind-set and human interaction implied inside Futour: the requirement of accountability and ownership of the problem and the facilitation and participatory processes that take place.

The first aspect regards the competence required to manage these places properly. Martinez underlined the accountability and empowerment responsibilities of both who is managing the process and of the client. Innovation Spaces should be coherent with the company organization strategy, thus

strongly connected to the decision-making processes and problem solving capacity of the organization. The respondent stated that whoever demands for some kind of change should show real commitment to it. Moreover, he emphasized again the engagement requirement of all stakeholders involved in facing the challenge "If you want something to have an impact, you need to make sure that whoever is inviting and supporting the creation of an innovation space also directly takes a lot of ownership of it (…) Innovation cannot be done through someone else. You have to be yourself engaged, you are one of the stakeholders, you are one of the parts of the problem so you have to be in it and cannot be delegated outside" (Martinez P., personal communication, 2020). Furthermore, Martinez expressed some common questions for the clients, such as "if you really want to do this, ask yourself why? What is long-term purpose? Where do you want to go? Why are you starting this?" (Martinez P., personal communication, 2020).

The second issue concerns the facilitation processes to deal with interaction among people inside future centers. He referred to the power of facilitation as crucial and critical, and therefore the professional capacity of facilitators should be fundamental. Martinez explained the aim of facilitators as trying to solve complex problems by "helping people to discuss, so that they take better decisions, helping people to communicate and guiding the process of change" (Martinez P., personal communication, 2020). He believes that participatory and co-creative processes are a principle inside future centers. He explains the processes as follows: "You first identify who has and wants to have ownership for the challenge, and only after that you start designing the innovation and design thinking process. Once the design thinking or innovation and facilitation process is done, there are prototypes that are implemented in 6 weeks/months/year time and there is a continuity" (Martinez P., personal communication, 2020). However, he also underlined the recent "fashion" in participatory processes, but "unless you do it properly you are creating populism" together with a waste of time and money. It has to be handled carefully and thus, the capacity of having good facilitators is key to design processes that are perceived as "independent and not manipulative when something is being performed" (Martinez P., personal communication, 2020).

Overall, Martinez considered the mind-set, competences and human interactions as fundamental for the correct progress of Future Centers. He indeed stated that "future centers are not just physical or facilitator spaces, they are part of a philosophy and a mind-set" (Martinez P., personal communication, 2020).

4.1.2 Impact on Society & Sustainability

Regarding the sphere of the society and sustainability efforts, Futour takes care of addressing societal complex innovation projects and processes for public and private clients through several methods, techniques and approaches. “We have been working lately on projects that relate to societal impacts and challenges such as sustainability, migration, and climate change” (Martinez P., personal communication, 2020).

Moreover, he identified the need to engage with different stakeholders, create partnerships and identify alliances together in order to achieve long-run sustainable solutions. He considers the involvement of different levels of society as a key to have an impact, together with the involvement of whoever has the decision-making. “I believe that the future of future centers is that they become mainstream, that there can be different levels, there can happen also in classrooms, universities and so on” (Martinez P., personal communication, 2020).

4.1.3 Innovation & Technology

Martinez defined future centers as agile and adaptive “innovation engines for the organization (…) created as part of the organizational change process” (Martinez P., personal communication, 2020). The idea expressed by Martinez is to have “nomadic” future centers focused on the idea of mobility and agility.

He talked about different kinds of technologies and tools exploring possible advantages and disadvantages and referred to technology as a “very useful and empowering tool that can leverage knowledge, can accelerate and improve communication. It depends very much on who is using it and for what purpose (…) Technology is not a solution per se, it is a means to a possible end, but it requires competence and choice of the right technology for the right setting” (Martinez P., personal communication, 2020).

Lastly, Martinez talked about innovation as “finding challenges and putting together creative solutions to those challenges (…) having an impact on improving the quality of life and the environment. It is a mind-set and it is the capacity of taking risks, of accepting to make mistakes and to experiment, to prototype, to include different perceptions and perspectives and it is the ability to listen and live with people that express the needs that you want to express through innovation. It is many things, it is what I love” (Martinez P., personal communication, 2020).

4.2 Skandia Future Center

Skandia is one of Sweden's oldest companies founded in 1855 and has its headquarter in Stockholm. It offers occupational pension with preventive health insurance together with mortgages and savings. (Skandia, 2020, *We are Skandia*, on-line website). It was the first company to fund a modern Future Center in 1996 at Vaxholm, Sweden by professor Leif Edvinsson. It is a prototyping space which mission is to "build on intellectual capital in order to turn the future into an asset:

- To be a meeting place for future work;
- To build bridges between organizations, functions and cultures;
- To increase knowledge-exchange" (Future Center Alliance, 2015, *The Pioneer – Skandia Future Center*, on-line website).

Skandia Future Center soon became a reference point and source of inspiration for many private and public companies that learned how to apply its principles to their own organizations (Future Center Alliance, 2015, *The Pioneer – Skandia Future Center*, on-line website). There are today more than 50 different forms of future centers in Europe and more than 50 in Asia (Edvinsson L., personal communication, 2020).

4.2.1 Mind-set & Human Interaction

The respondent Edvinsson recognized the importance of the innovation environment so to trigger the thinking. In particular, he described two aspects of the mind-set: *"smelling capability"* and *"anticipatory learning"* (Edvinsson L., personal communication, 2020).

The smelling capability is essential to "learn to smell the future" and thus, inside the future center they have worked on different senses and learned by experimenting on them. Edvinsson explained that a future center is a tool rather than a space, nonetheless, it has many dimensions in the space. Thus, the question is how to design it so that it triggers your mind, taking in consideration all senses.

Anticipation is about "seeing the signal before the signal hits you" and to be able to do it, you need new types of navigational tools. These allow observing and learning what is around the corner. In this context, Edvinsson states, "when the bullet is hitting you, it is too late. It is not about defending; it is about moving forward based on your anticipatory thinking" (Edvinsson L., personal communication, 2020). Facilitators will help to get around the corner, helping to think in untraditional ways and seeing things from new perspectives. Their role is to deal with the fear of people and counterbalance it with trust and fun. "Fun is important because we have to counterbalance the fear and the fear has to be handled with balance of trust. The trust is based on that you see that you can work, sail, or navigate for, instead of being caught by the tide" (Edvinsson L., personal communication, 2020).

4.2.2 Impact on Society & Sustainability

Edvinsson recognizes the need for future centers today to address the "most important focus for today: societal innovation" (Edvinsson L., personal communication, 2020). Indeed, future centers represent where you find the "experiments and prototyping of the society of tomorrow" in order to meet demands and requirements, such as ecology to speed of innovation of law making.

Future centers imply navigating in complex global dynamics of the society. Therefore, new types of navigation systems are required, and this is why there is the need for Innovation Spaces. The question to ask is "how can you increase the transparency and visibility of what is around the corner?" Regarding sustainability in particular, Edvinsson stated, "it might be that it is not sustainable at all. It is increasing your navigational skill, which is changing every second, so the sustainability is a paradox or illusory trust." To have an impact on society, future centers require the ability to constantly readapt to the surrounding environment and to think for future generations, maybe also "seven generations down the road". Otherwise, the risk is to become obsolete. "Some people say that the recipe for a future center has a life length of roughly 5 years and then it has to readapt. It is very interesting that we have that kind of expectations that once you have done it, it is fixed, and that causes many problems" (Edvinsson L., personal communication, 2020).

4.2.3 Innovation & Technology

Skandia Future Center is a prototyping and experimenting that allows taking risks without hurting the whole organization. You are able to develop the capacity to change in a "laboratory or innovation space where you can test with lower degree of disturbances and lower degree of risk" (Edvinsson L., personal communication, 2020). Moreover, it is also the place external knowledge can be incorporated, and you can distinguish between relevant and irrelevant knowledge by experimenting. Nevertheless, this requires "High speed, high intelligence and a lot of fun." Technology within the future center is essential to help to get signals from the outside environment as well as the internal one of the enterprise. It allows navigating in a better way, getting to know what kind of navigational signals are around the corner. Moreover, Edvinsson believes that innovation is the way to "be on the edge, looking around the corner to the benefit of future generations that is "futurizing" for me." It is about challenging the present information and stretching it in order to look for new angles (Edvinsson L., personal communication, 2020).

4.3 InnovAction Lab

The initiative InnovAction Lab was a university program which first well-structured edition took place in 2011 and went on until 2015 (Merialdo P., personal communication 2020). Their goal was to "bring young people closer to the world of innovative entrepreneurship and investor community" and indeed, they founded 40 startups and involved more than 800 alumni (InnovAction Lab, 2020, *about us,* on-line website). The program helped university students evaluate the potential of a business idea and learn how to pitch it to private investors through effective untraditional teaching methods, such as dealing with real entrepreneurial problems. It was completely free and open to any university student or graduate with any academic background as well as who had not attended university. After signing up, heterogeneous teams were built and a mentor was assigned to each team (InnovAction Lab, 2020, *InnovAction Lab – How it works,* on-line website).

4.3.1 Mind-set & Human Interaction

Professor Merialdo emphasized two important points concerning the mind-set that was essential inside InnovAction Lab: the *complete commitment* and an *entrepreneurial mind-set.* Firstly, Merialdo recognizes the importance of having a complete commitment to an Innovation Space to make it successful. Excitement about it is not enough, there has to be a strong incentive to run it. Regarding the creation of a spin-off that was not successful Merialdo stated: "one thing that it certainly made me understand was that to make a company you have to be completely committed and present" (Merialdo P., personal communication 2020).

The second aspect regards the lack of entrepreneurial culture that Merialdo recognized especially in technical or scientific schools, and the resulting need for its promotion. "In my opinion this aspect is missing a lot, the aspect of pushing students to have a more entrepreneurial mentality" (Merialdo P., personal communication 2020). It is very inconvenient since engineers or scientist always have the skills and the possibility to make innovation at a very low investment cost. In this regards, Merialdo stated "We need to push our students and open up to the idea that if they have a minimum of entrepreneurial skills, they should actually think in these terms as well. Innovation can hardly be achieved without technical knowledge. (…) It's someone who can make things that brings innovation. In addition, my students were the ones who could somehow potentially know how to do things concretely. However, at the same time I thought it was necessary for our students to be somehow contaminated by even more business ideas". He identified a great inertia linked to a cultural limit of the country as a whole to think differently and there is the need to "work precisely to try to overcome it, since it makes everything extremely difficult" (Merialdo P., personal communication 2020).

4.3.2 Impact on Society & Sustainability

Merialdo believes that Innovation Spaces must have an impact on society to exist; otherwise, they have no purpose and are self-referential. He thinks that the only way to achieve it is by creating a "fit into an overall ecosystem where there are more actors participating in some way and if it manages to get out of your context" (Merialdo P., personal communication 2020). Thus, the idea behind InnovAction Lab is to create a strong link with the external environment, involving entrepreneurs, investors and managers. However, he considers the impact as something long-term, since it takes a lot of time to change the culture of a country and this process implies much patience. Moreover, InnovAction Lab encouraged the disciplinary heterogeneity of the groups.

A further aspect that Merialdo recognized regards the provinciality of these initiatives. He stated the following: "everyone does his own little thing and thinks only about that, while the reasoning has to be done much more at a system level. (…) Thinking about the self-referential garden is no solution. The idea is of trying to make it grow as much as possible and more and more to network with other similar initiatives" (Merialdo P., personal communication 2020).

4.3.3 Innovation & Technology

InnovAction Lab is conceived as the physical space where groups get together, follow a training path, and end up with an investor pitch. However, the main need and final goal was to end up with a prototype of something concrete but this appeared to be difficult. This is because the challenge of innovation takes place when the risk gets higher, therefore he states that "you have to take away some fear of making mistakes, because then you can actually try something that doesn't work" (Merialdo P., personal communication 2020). This was the idea behind the creation of the space InnovAction Lab.

A winning aspect of the program was "to start from the assumption that we were building on skills that the university had already given to the students in some way. We had to inject only small but fundamental extra things that are the basis of a start-up, (…) These were the fundamental elements, in fact the number of seminars was extremely small but was able to give those pills that then built on skills that people already had" (Merialdo P., personal communication 2020). Indeed, students already had the capabilities required in order to make the program successful, it was just a matter of pulling them out. "You just had to leverage and bring out things that someone had already seen but maybe had not been able to focus so well on" (Merialdo P., personal communication 2020).

4.4 Castellum Innovation Lab

Castellum was founded in 1993 and has its headquarter is located in Gothenburg. It is one of Sweden's largest real estate companies listed on the stock exchange with more than 250.000 employees. It owns 700 buildings and is present in 20 cities in Sweden and in Copenhagen and Helsinki (Castellum, 2020, *about Castellum*, on-line website).

Castellum's ambition was to become the industry leader in digitalization by 2020 and this is why in 2017 it established the industry's first Innovation Lab. The idea was to "proactively pursue technology-based business development and to adapt the service offering in accordance with changing conditions" (Castellum, 2020, *About Castellum - Digitalization*, on-line website). In the Innovation Lab, Castellum operates collaborating with external business developers as well as consulting start-ups. The goal is "to develop Castellum through people-centric digital innovation. Our focus is on developing innovative solutions that support developing the customer offering and Castellum's own operations in the project development process, everyday management and operations" (Castellum, 2020, *About Castellum - Digitalization*, on-line website).

4.4.1 Mind-set & Human Interaction

Ingeström considers a critical aspect for a successful innovation place to have a clear purpose. It should address a good question and theme, not too broad and not too specific or else it is going to be hard for people to understand what is going on. In this matter, the respondent affirmed, "I think that everyone who comes there needs to know what you want to happen when you're in the space. (…) I think it's important to have these kind of themes. If it's too wide, it's going be hard it's going to be hard for people to get really good ideas. It is better to get it smaller and to have a theme" (Ingeström N., personal communication 2020).

A further aspect that is essential in the creation of Innovation Spaces is to render the space open for everyone. Innovation spirit comes out when people dare to be open-minded and actually dedicate time to it. "The biggest problem is to get time from people actually. Some companies have Innovation Spaces where they have dedicated people to work in this space. When you have that, however, the innovation spirit does not come outside these walls. (…) Therefore, I think the challenge is to open up this space for everyone" (Ingeström N., personal communication 2020).

4.4.2 Impact on Society & Sustainability

Ingeström recognized three main needs that an Innovation Space should meet in order to have an impact on society: the *need to balance long run and short run goals*, the *need to collaborate and involve all the community* and lastly the *support of the government* to build smarter cities.

Firstly, the need to look into the future and to think about the "big picture" is essential. However, Ingeström also considers that "we need to spend most of the time on things where we can get money actually in a near future. Many Innovation Spaces look on this big picture and on future things but then you need to be able to take small parts of that to create something you can do already now" (Ingeström N., personal communication 2020).

The second aspect that Ingeström takes into account is the need to collaborate with all different people of the community. In particular, he recognizes the importance to consider all group ages, including kids of 12-15 years old as well as older people. "The biggest problem that companies face today is that if they just try to do the innovation by themselves they will never get good innovations. You need to collaborate with a lot of different other people (…) what do they want from the future?" (Ingeström N., personal communication 2020).

A last point regards the support from the government in order to build smart communities and these, future smarter cities. Governments have the monetary resources to create common Innovation Spaces in order to make better cities, however they don't have the knowledge to create them. Thus, it is the companies' responsibility to push for this and contribute in making better cities for future generations. On this matter, Ingeström said, "I would like to have more government driven Innovation Spaces in bigger cities so we can get together all these companies and actually innovate about how we should build a smart community. That is difficult though, and it is a hard question" (Ingeström N., personal communication 2020).

4.4.3 Innovation & Technology

Castellum decided to create a virtual innovation space in order to have as many people involved, although he believes that the physicality of a place would be important. Indeed, he stated "you need some kind of space, obviously, the best way is if you can go into room and have other people there and meet people, but if you can have it digital as well, it is really good" (Ingeström N., personal communication 2020).

For what regards the technology used, Ingeström assumes that the "most important thing is to make all the people understand the technology" (Ingeström N., personal communication 2020). He believes

that the real issue when it comes to technology is to make sure that the people involved understand it and make a wise use of it. Thus, it is fundamental to stay updated on the latest technologies and to train on their use. He refers to this as "digital fitness" and thinks, "technology is moving so fast you need to read about it every week and that is the tricky part. Moreover, most of the time people are afraid of the technology and they shouldn't be because it's easier to repair data than to repair humans" (Ingeström N., personal communication 2020).

Moreover, he conceives innovation as an "implemented creative idea which creates new values for your company" (Ingeström N., personal communication 2020). The main idea is that it should be new in the business where it is created and has to add value in some way. It should also be a fun process that gets everyone involved. In this matter, the respondent affirmed, "If people when getting coffee talked about new ideas they came up with, instead of talking about problems, then innovation would be much stronger (…) if everyone started to talk like that then you get a really good company and it's much more fun as well. Innovation should be fun" (Ingeström N., personal communication 2020).

4.5 BioVentureHub

AstraZeneca is a British-Swedish multinational science-led biopharmaceutical business with its headquarter situated in Cambridge (AstraZeneca, 2020, *Our company*, On-line website). AstraZeneca's BioVentureHub was established in 2014 as an innovative ecosystem to strengthen life science industry in Scandinavia. It is located in Gothenburg at the heart of AstraZeneca's R&D site and is conceived as an "innovative way to access big pharma know-how and infrastructure" (BioVentureHub, 2020, on-line website). The CEO of BioVentureHub Magnus Björsne describes it as a model where SMEs "take part of human capital and infrastructure that sits within industry as a means to strengthen the ecosystem as a whole" (Björsne M., personal communication 2020).

It is an example of open innovation including 30 emerging life science companies and academic groups where everyone can access infrastructure and resources with no physical barriers. They have done it though a public-private partnership model with the region, the city of Gothenburg and external private investors (Björsne M., personal communication 2020). It is open to companies from many sectors and is a growth catalyst for companies "whether you are biotech, medtech, e-health, academia... the core principle permeating throughout the BioVentureHub is that you share a collaborative and open attitude built on mutual respect, innovation and scientific curiosity" (BioVentureHub, 2020, on-line website).

4.5.1 Mind-set & Human Interaction

Björsne discussed about the facilitating processes and human interaction that take place inside BioVentureHub. He depicted three levels: *informal contacts* taking place in the canteen, coffee shops and common work environments, through the respective *contact person* within AstraZeneca and lastly through the *regular meetings* between the companies where interesting collaborations are motivated. There is no specific HR in charge and the underlying idea is to use all people inside AstraZeneca (Björsne M., personal communication 2020).

The respondent described the environment inside BioVentureHub as a learning opportunity based on "curiosity about technology and science that drives progress rather than expected monetary returns. (…) If you believe in it then you think there is something you should try and test. Don't try to anticipate and believe that you know everything because I don't think that's not how we evolve as mankind" (Björsne M., personal communication 2020). Moreover, he also expressed the importance of being open-minded although "you need to create an environment where people dare to be open-minded" (Björsne M., personal communication 2020). He believes that proximity has been a key success factor. The openness of BioVentureHub can be observed in the fact that it is located right at the heart of AstraZeneca R&D site. In this regard, Björsne stated "these people have the same access to the R&D as I have and as every employee, there is no physical barrier" (Björsne M., personal communication 2020).

Furthermore, Björsne considers that the creation of an innovation space can be "totally independent of industry but I don't think it can be independent of culture (…) so it is really a cultural experiment rather than a tech experiment" (Björsne M., personal communication 2020). He recognized the possibility of a cultural risk of falling back in traditional ways of doing business, but also the total independence and freedom in the creation of BioVentureHub. There were no plans but only a strong vision of what would be achieved. "If you are stuck to the norms of the culture you sit in, it's very difficult to change it, but we built it from scratch. We had no idea how to do it, we didn't have a product plan of how to do it. We only had a vision of what we wanted to achieve" (Björsne M., personal communication 2020). In this context, Björsne identified the willingness to try new things as a key success factor.

4.5.2 Impact on Society & Sustainability

For what regards the impact on society and sustainability aspects, Björsne described two main issues: the *goal of strengthening the ecosystem* and the underlying idea of *sharing economy and circular economy*.

The main goal of BioVentureHub is to strengthen the ecosystem as a whole by implementing a model where SMEs take part of human capital and infrastructure that lies within the industry. They have the financial support of the Swedish government and thus it has been a private-public partnership with the region, the city of Gothenburg and other external private investors, including AstraZeneca. He used the expression to "go from an ego system to an ecosystem". Moreover, Björsne affirmed that the impact on society is not an objective per se, rather "the result of more successful companies in life science will have a societal impact in itself. More work opportunities is also societal impact, but that's not the key driver but rather it's a result of what's happening (…) If we can contribute to strengthen life science in Sweden we benefit from that, because we're all dependent on competence and we are dependent on the innovation to take place. One thing is strengthening the ecosystem as a whole is a win-win for everybody who is in it" (Björsne M., personal communication 2020).

The core idea is to use existing resources in an alternative way and take advantage of the great amount of existing capacity that AstraZeneca did not use. The respondent described it as a "circular economy applied to industry or the sharing economy (…) it's about using existing resources in alternative ways. If I have a pen and I don't use it seven days a week and I borrow it to you, that is sustainability rather than you are buying your own pen" (Björsne M., personal communication 2020). He recognized the need to spare instruments, labs and other resources since "industry sits on so much resources that in some periods of time" (Björsne M., personal communication 2020).

4.5.3 Innovation & Technology

The whole concepts on which BioVentureHub's Innovation is based on consists of *"non-competitive complementarity"*. It is the idea that different competences and technologies are combined in order to co-develop innovation together. The aim is to build a non-competitive environment where the "blend of different technologies can lead to new types of innovation, either between the companies themselves or between them and AstraZeneca" (Björsne M., personal communication 2020).

All companies involved are different and originate from different sectors. Regarding this issue, Björsne stated, "diversity drives innovation and we need to define or redefine what we mean with diversity. It's not only passports and gender, it is culture, ideas, background and everything. The more diverse you are, the more likely it is that you we come up with new ways of thinking" Björsne M., personal communication 2020). Thus, the respondent recognizes the need to find new ways of innovating where the business logic doesn't match. The diverse business ideas results in no

competition between them and “they can all use each other skills to become better themselves without jeopardizing commercial interests” (Björsne M., personal communication 2020).

There are different requirements for the companies involved. The first is the need to be capitalized and financed. Then they look at what type of help they need as well as what that company can provide into the ecosystem, such as possible synergies. The third requirement is the robustness of the technology and science and lastly, they do due diligence on the people to know people that will potentially enter the company (Björsne M., personal communication 2020).

An important aspect of the companies involved is the mix of four different value chains and technologies in the same environment. There are ICT companies, tech companies, diagnostic companies and pharma companies. The reason is that the future will demand for a combination of all these technologies and thus, the idea to gather companies, which have technologies that are relevant for the innovation that is needed in the future. On this matter Björsne stated “we are about to redefine what we mean with innovation basically, and we want to catalyse innovation across these different sectors (…) Normally, when you sit in an environment like this you get help with business plans and commercialization plans but don't get help with the hard core technology that is what you are trying to develop. So that is what we have focused on, to give them access to science knowledge and development knowledge.” (Björsne M., personal communication 2020).

Moreover, when thinking about the future of BioVentureHub, Björsne believes it will even more focused about complementarity and about doing innovation and product development by blending different industry competencies. He states the future will be “where they need our competence and our understanding of the market and we need their skills in order to jointly innovate” (Björsne M., personal communication 2020).

4.6 Learning Lab

Akademiska Hus is a Swedish government enterprise established in 1993 and one of the country’s largest property companies. Their mission is to strengthen Sweden as a knowledge nation by building, developing and managing environments for education, research and innovation. It has different sites all over Sweden and approximately 300.000 people study and work in their properties every day (Akademiska Hus, 2020, *about Akademiska Hus*, on-line website).

Akademiska Hus created a new concept called *A Working Lab* that consists in a co-working space offering flexible innovative environments for learning and working. There are three initiatives in

progress, respectively located in Solna, Umeå and Gothenburg. (Akademiska Hus, 2020, *a working lab*, on-line website)

Learning Lab is part of the innovation work that is conducted in *A Working Lab* in Gothenburg, built in the area of Chalmers. It represents a meeting place for innovation, collaboration, and a creative studio where innovation projects and realization of ideas take place. Learning Lab offers an environment that can be adapted to different situations in order to create the right conditions for any scenario (Akademiska Hus, 2018, *Learning Lab*, on-line website)

4.6.1 Mind-set & Human Interaction

The functioning of the Learning Lab is that participants and visitors need to have a clear picture of what they want to achieve inside those rooms and then they will be staged in order to reach the goal. The rooms will be empty from the beginning and participants are welcome to do whatever they want with them. The main idea is to encourage people to change the way workshops, presentations and exhibitions are done and start thinking from new perspectives. The challenge will be to find people that are brave and open-minded enough to try different ways. In this matter, Björk stated "we want to ask our customers if they are brave enough to try something new and see what happens. We all know what will happen in the traditional way. But when they step inside the room they immediately feel that this is something different, something non-traditional" (Björk J., personal communication 2020).

Björk recognizes that for the creation of the Learning Lab it was necessary to find people very different backgrounds and that can add something different to the space. He affirms "We have something else that we bring into these rooms (…) I think we bring a creative and pedagogical aspect that hasn't been here before because so far it's almost being just engineering and building" (Björk J., personal communication 2020).

The respondent believes that this process involves also challenging new senses, instead of being used to the same. "I know there is the audio sense, listening, maybe visual sense but that's basically it, we're not very physical, we don't move around, we don't taste, we don't smell things". Thus, the environment from the very beginning will challenge you "to start to think of what kind of decisions do you take and what factors do you bring with you or do you expect" (Björk J., personal communication 2020).

According to Björk, the future of the Learning Lab might involve much more people willing get an insight on new thoughts and seeking for a thrill. "You go to amusement park to be shaken around a

bit (…) you really get some weird perspectives. I would like those people to come here and ask for the same experience but in a scheduled meeting setting. (Björk J., personal communication 2020).

4.6.2 Impact on Society & Sustainability

Björk made two considerations regarding the impact on society and sustainability of the Learning Lab. The first regards the fact that the material inside the lab is not that sustainable since much technique and electricity is involved in the rooms. However, there is the idea of reusing material and finding a second use. The second aspect regards the idea of bringing the entire house together providing value for all the locals living around the lab. Thus, including people from all parts of the society, such as politicians, teachers and entrepreneurs. The respondent states "every one of them that does something special that hasn't been done before will give us more experience and will give us some learning and we will grow from it" (Björk J., personal communication 2020).

4.6.3 Innovation & Technology

The Learning Lab is perceived as a place to "investigate, explore, and try to foresee what the learning environments now and in the future could look like" (Björk J., personal communication 2020). Björk considers it a prototype environment where "everybody needs to go in and start to identify their own thinking and then go out and be fantastic in the ordinary world" (Björk J., personal communication 2020).

For the creation of the Learning Lab, Björk believes that they recognized their existing limits and the lack of specific competences in order to bring these ideas alive. They realized that there was a need for a different kind of person, someone that possessed those skills. He added "I think when they started to realize what was going on, what you would end up with, I think that's when they started to also look around to see what kind of people do we need" (Björk J., personal communication 2020).

In the future, the respondent also conceives it as an "experimental room where you really try out stuff, sort of prototyping brand new techniques and see what's working and what the experiences are. That's one picture, but in that picture it's still only for a small group. It's for the researchers or the early adopters" (Björk J., personal communication 2020).

4.7 Summary Table of Empirical Findings

The following table **(Table 3)** summarizes the empirical findings from the primary data collection, such as semi-structured interviews. It shows the case companies and the respective respondents in relation to the three *themes*.

Themes / Cases	**Mind-set & Human Interaction**	**Impact on Society & Sustainability**	**Innovation & Technology**
Paolo Martinez **Futour**	- Accountability & ownership - Facilitation and participatory processes	- Societal impacts and challenges - Partnerships and alliances to have impact	- Future centers as agile and adaptive innovation engines - Tech competence - Innovation as mind-set
Leif Edvinsson **Skandia Future Center**	- Smelling capability - Anticipatory learning - Facilitators to reduce fear of people	- Focus on societal innovation - Navigation in complex global dynamics - Need to readapt	- Prototyping & experimenting space - Technology to get external signals - Innovative "futurizing"
Paolo Merialdo **InnovAction Lab**	- Complete commitment and presence - Entrepreneurial mind-set	- Long-term impact by fitting in ecosystem - Need to network with similar initiatives	- Need to prototype something more concrete - Build on existing capabilities
Niclas Ingeström **Castellum Innovation Lab**	- Clear themes and big questions - Open-mind & dedication	- Balance short and long run goals - Involvement of all community - Support of government	- Virtual innovation space - Digital fitness - Involving and fun innovation process
Magnus Björsne **BioVentureHub**	- Facilitating processes - Learning & open environment - Culture experiment & clear vision	- Goal to strengthen ecosystem is a win-win - Circular economy & Sharing economy	- Non-competitive complementarity - Blend technologies across different sectors
Jonaz Björk **Learning Lab**	- Purpose to do things untraditionally - New perspectives - People with different backgrounds	- Bring entire house together - Material not sustainable idea of reusing	- Prototyping and explorative learning environment - Specific competences needed

Table 3 – Summary table of empirical findings. Source: Produced by the author

5. Data Analysis

This chapter will present the empirical findings analyzed following the themes order. Each theme will be discussed in detail explaining the most important "aspects" of each of them. First, the Mind-Set & Human Interaction among the Innovation Spaces will be taken in consideration and compared through the different cases. Then, the focus will be on the Impact on Society & Sustainability throughout the companies. Lastly, the emphasis will shift to the level of Innovation & Technology. Each theme, and in detail each "aspect", will be related to the theoretical framework, such as the secondary data collection.

5.1 Mind-set & Human Interaction

The human sphere about the interaction among individuals and the mind-set and approaches engaged inside the Innovation Spaces appears to be very relevant also for what concerns existing literature that is the secondary data collection. Indeed, as Wagner & Watch (2017) acknowledged, in the last years the focus of effective Innovation Spaces has mainly been on strengthening "human-ness." The role of people is elevated as a critical link between innovation and place (Wagner & Watch, 2017). Innovation is increasingly viewed as a social process that takes place in an ideal working environment, which enables fruitful interaction between different actors (Oksaken & Stalhe, 2013). The concept of "ba" refers to the place where participants can interact and create new meanings and knowledge. It becomes context-specific in terms of time, space, and relationship with others (Nonaka, Toyama, 2003: p. 6f).

Any kind of innovation activity finds its basis on cognitive processes of interaction and social processes (Peschl & Fundneider 2012). Many emotions and experiences are attributed to space, resulting to the connection between space and imagination. In turn, physical space is correlated with cognitive space. Cognition and emotion integrate body and mind, and this activity has to be considered together with the physical reality where it is "situated", where challenges are met and action is required (Kristensen, 2004).

From the primary data collection, such as semi-structured interviews, some common points have been found. Indeed, regarding the sphere of *mind-set and human interaction*, the respondents have touched four main "aspects". These are presented below and are respectively:

1. *Accountability and commitment* of the ownership of Innovation Spaces,
2. The *facilitation processes* that take place,
3. The presence of a *clear theme and purpose*,
4. *Learning and open* environment of the innovation space.

Although all four "aspects" were discussed in almost all interviews, the table **(Table 4)** depicts in which case interviews the "aspects" have been mainly explored.

Aspects / Cases	**Accountability & commitment**	**Facilitation process**	**Clear theme & purpose**	**Learning & open environment**
Futour (IT)	✓	✓		
Skandia Future Center (SE)		✓		✓
InnovAction Lab (IT)	✓			✓
Castellum Innovation Lab (SE)			✓	✓
BioVentureHub (SE)		✓	✓	✓
Learning Lab (SE)			✓	✓

Table 4 – "Aspects" of *Mind-set & Human Interaction*. Source: Produced by the author

Accountability & commitment

The first aspect of accountability and commitment of who is managing the innovation space was substantially underlined both in Futour's case as well as in InnovAction lab, the two Italian case companies. In the former case study, the accountability responsibilities of both the owner and the client that receives a service are stressed by the respondent. They both have to be in first place engaged if they want innovation to take place. This also means that there should be coherence and a strong connection with the decision-making processes of the organization. (Martinez P., personal communication, 2020). This last aspect was found also in literature as one of the 13 building blocks of future centers identified by the authors Dvir et. al (2006). Indeed, strategy has to be clearly communicated across all levels of the organization and has to be closely connected to the overall strategy of the organization. The innovation environment can be considered part of the overall innovation strategy (Moultrie et. al, 2007). The authors Oksaken & Stalhe (2013) also consider *Value Reflecting* as a characteristic of Innovation Spaces suggesting that they should be viewed as a continuation of one's identity, supporting the firm's values and company culture to inspire people.

For what regards InnovAction Lab, the respondent also agrees on the complete commitment dedicated for the development of any effective and successful innovation space. Indeed, Innovation labs provide this dedicated time of reflection and engagement in creative activities (West, 2002). As Lewis and Moultrie (2005) reported, innovation laboratories can offer real benefits to the organizations, and this includes reinforcing corporate commitment to innovation.

Facilitation process

The facilitation process proved to be crucial in many Innovation Spaces investigated, in particular in Futour, Skandia Future Center and in BioVentureHub.

In Futour's case, the facilitation process was described as the participatory and co-creative process of solving complex problems by "helping people to discuss, so that they take better decisions, helping people to communicate and guiding the process of change" (Martinez P., personal communication, 2020). The respondent Edvinson of Skandia Future Center referred to the role of facilitators as helping to think in untraditional ways by dealing with the fear of people (Edvinsson L., personal communication, 2020). In BioVentureHub, instead, the facilitating process is mainly on three levels of interaction: informal contacts, through the contact person and by regular meetings. There is no specific HR or certified facilitator but instead the team of five people, which solely work with the hub, carries on the facilitating interaction processes (Björsne M., personal communication 2020).

As explained also in the theoretical framework, facilitation processes are crucial to achieve the right interaction, communication and effectiveness inside an innovation space (Lewis & Moultrie, 2005), (Offner, Kramer & Winter, 1996). Magadley & Birdi (2009) suggested their central role to "manage the moods and motivation of group members and steer discussions in the right direction in such complex and stimulating environment".

Clear theme and purpose

One further critical feature of Innovation Spaces appeared to be the presence of a specific theme and purpose clear to all stakeholders involved. This characteristic emerged from the interviews with Castellum Innovation Lab, BioVentureHub and the Learning Lab.

Castellum Innovation Lab's respondent Ingeström considers it essential for a successful innovation place to have a clear theme. The space should address a good question that can be understandable by whoever enters inside. It should be something to which everyone can relate to and that addresses big

"global" issues (Ingeström N., personal communication 2020). In the case of the creation of BioVentureHub, although there was complete independence and freedom in the functioning of the space, there was a clear vision of what would be achieved. The respondents considers this crucial. (Björsne M., personal communication 2020). For what concerns the Learning Lab, the main idea behind its functioning is that whoever wants to participate needs to have a clear picture of what to achieve inside those rooms (Björk J., personal communication 2020).

Moultrie et al. (2007) consider the underpinning strategic intent of a space as the starting point for the creation of any innovation space. Its presence can prevent dedicated environments becoming irrelevant spaces with an apparent but lacking purpose.

Learning & open environment

Almost all respondents have underlined the existence of an open and learning environment inside the various Innovation Spaces. Edvinsson underlined the importance of having a learning environment inside Skandia Future Center that triggers the smelling capability of observing and learning what is around the corner. It implies observing carefully the signals that may arrive and anticipate them. (Edvinsson L., personal communication, 2020). The program InnovAction Lab was open to anyone who had interest in participating, students, graduates or non-students, and was free of cost. Moreover, the program allowed forming mixed and heterogeneous teams that could exchange knowledge, build on existing capabilities and learn from others. The goal was to have an environment "contaminated by even more business ideas" (Merialdo P., personal communication 2020). A similar case is Castellum Innovation Lab which main challenge is to open up the space for everyone and create an open environment. From this concern, comes the idea to create a virtual space that can host as many people as possible (Ingeström N., personal communication 2020). Björsne describes BioVentureHub as a learning opportunity where people need to dare to be open-minded and experimental. Indeed, the site is located at the heart of AstraZeneca R&D department and thus all people have the same access to it, with no physical barrier (Björsne M., personal communication 2020). Also the Learning Lab's main challenge, as described by the respondent Björk, is to find people that are brave and open-minded enough to try something new and start to think from different perspectives. A key aspect in the creation of the space can be traced back to the different people with diverse backgrounds that were essential in adding something new to the space (Björk J., personal communication 2020).

Physical spaces can foster innovation and creativity by representing the drivers of innovation, such as openness, collaboration, sustainability and wellbeing (Oksaken & Stalhe, 2013). According to

Wagner & Watch, (2017), the increasingly "open" and collaborative nature of innovation is changing the design of Innovation Spaces. Indeed, architects underlined that innovative spaces are more open, transparent and inviting. The process of innovation includes all people that will use the space, following the idea of the "democratization" of innovation. Moreover, innovation in today's dynamic business environment commonly takes the form of "open innovation", which involves opening up to the external world (Chesbrough, 2003). For what regards the specific types of Innovation Spaces, openness appears to be a key aspect of future centers (Dvir et al., 2006), living labs (Bergvall-Kåreborn et al., 2009) and of Smart Working Centers (Errichiello & Pianese, 2018). Furthermore, Innovation Labs are characterized by a process of double-loop learning that starts from questioning the main values and norms of a company, challenging assumptions and aiming at re-framing the questions (Lewis & Moultrie, 2005).

Summary of sphere *Mind-set & Human Interaction*

The evidences found in the primary data collection through the respondents appear to be aligned to the existing literature. Indeed, according to the latter, the focus of Innovation Spaces has been mainly on strengthening the humanness and encouraging interaction between different actors.

The first "aspect" of accountability & commitment was looked at by the two Italian firms, such as Futour and InnovAction Lab, and implies for a complete dedication of who is managing the innovation space. Moreover, as noticed both in interviews and literature, it entails that the commitment to innovative practices should be aligned and coherent to the overall strategy of the organization. The second "aspect" of facilitation processes was mainly observed in the two future centers (Futour and Skandia Future Center) as well as in the Hub (BioVentureHub). All underlined the importance to manage the social interactions and communication inside the space, in line with theory that emphasizes the central role of facilitation processes. The third "aspect" of the existence of a clear theme and purpose of the innovation space was argued by three Swedish case companies. Having an underpinning strategic intent is considered a starting point for the creation of any innovation space. The fourth "aspect" of the learning and open environment inside an innovation space was the one that was emphasized by most respondents. Almost any space is open to whoever wants to participate, made exception for those places that are open only to those specifically involved in the innovative activities of the firm. The learning attitude implies that the spaces represent an opportunity to train, learn from others and think from new perspectives. In accordance to the theory, openness is a driver for innovation and is influencing the way Innovation Spaces are designed. The aspect of learning environment was not specifically found in existing literature.

5.2 Impact on Society & Sustainability

This sphere regards the relationship of Innovation Spaces with the external environment, their potential to create an impact on the society and to achieve sustainable solutions. There has been an increasing attention towards sustainable products and services and today's challenge to achieve a sustainable competitive advantage in order to meet future demands appears implement (Liedtke et. al., 2012), (Lawson & Samson, 2001).

The design of Innovation Spaces can represent an essential aspect in realizing change towards sustainability and encourage creative solutions through a systemic approach (Mulgan, 2014). "Before a creative process starts, an individual needs to interact with a stimulating environment" (Calvo and De Rosa, 2017). The idea of "design activism" can play a key role in in enabling social change and in arising awareness about communal values and beliefs (Calvo and De Rosa, 2017).

During the interviews, the respondents tackled four main "aspects" of this theme, *Impact on Society & Sustainability*. They are presented below as:

1. The focus on *societal challenges*, impacts and innovations,
2. The *involvement of all stakeholders* in the innovation space,
3. The need to *fit with ecosystem*,
4. The concept of *circular economy*, sharing economy and reusing material.

The table **(Table 5)** depicts which respondents emphasized more in detail which aspects.

Aspects / Cases	**Societal challenges**	**Involvement of stakeholders**	**Fit with ecosystem**	**Circular economy**
Futour (IT)	✓	✓		
Skandia Future Center (SE)	✓		✓	
InnovAction Lab (IT)	✓	✓	✓	
Castellum Innovation Lab (SE)	✓	✓		
BioVentureHub (SE)	✓		✓	✓
Learning Lab (SE)		✓		✓

Table 5 – "Aspects" of *Impact on Society & Sustainability*. Source: Produced by the author

Societal challenges

Almost all respondents touched this aspect and recognized its importance. Futour stated that the aim of a future center is to address societal complex innovation projects, including sustainability, migration and climate change (Martinez P., personal communication, 2020). Similarly, Edvinsson from Skandia Future Center agreed that the need for future centers today comes from the current most important focus that is societal innovation. They offer the opportunity to experiment and prototype the society of tomorrow to meet demands and requirement of future generations (Edvinsson L., personal communication, 2020). Professor Merialdo, respondent from InnovAction Lab, believes that Innovation Spaces *must* have an impact on society to exist, otherwise they end up being self-referential and with no purpose (Merialdo P., personal communication 2020). For what regards Castellum Innovation Lab, the respondent recognized the need to look into the future, think about the "big picture", and at the same time balance it with the ability to achieve short run goals (Ingeström N., personal communication 2020). BioVentureHub's respondent Björsne does not consider the impact on society as an objective per se of the hub, but rather as a result, by strengthening life science and creating more work opportunities (Björsne M., personal communication 2020).

From most Innovation Spaces of the case study, emerged the importance of societal innovation. Also from the secondary data collection, it can be noticed that today's pressure from the economic, social and environmental fields calls for a greater emphasis on collaborative, long-term sustainable solutions (Magadley & Birdi 2009). Several types of Innovation Spaces aim at creating the conditions that foster these innovations, in particular "Eco-innovations." These consist in the creation of "novel and competitively priced goods, processes, systems, services, and procedures that can satisfy human needs and bring quality of life to all people with a life-cycle-wide minimal use of natural resources" (Reid and Miedzinski, 2008). The managerial response to today's context resulted in a rapid growth of dedicated spaces for innovative processes. They represent a pragmatic response to intangible problems, such as the need to be more future-oriented (Lewis & Moultrie, 2005).

Involvement of stakeholders

The involvement of all stakeholders interested in the innovation space, including the community and government is also deemed a key aspect. Firstly, Martinez identified Futour's need to engage in partnerships and alliances with all stakeholders, in order to involve the different levels of society that contribute to the decision-making. This is crucial to have an impact and achieve long-run solutions. (Martinez P., personal communication, 2020). Moreover, the idea behind InnovAction lab is to create

a strong link with the external environment and involve entrepreneurs, investors and managers. Each program ended up with a "grand final" event where many important investors were invited. (Merialdo P., personal communication 2020). Ingeström considers it necessary for Castellum Innovation Lab to collaborate with all levels of the community, taking into consideration all group ages, including kids and elderlies (Ingeström N., personal communication 2020). This point was stressed also by the respondent Björk in the Learning Lab, with the idea of bringing the entire house together and generating value for the community as a whole. The Learning Lab is open to all parts of the society, from politicians to teachers to entrepreneurs (Björk J., personal communication 2020).

The idea of involving all the societal stakeholders inside the innovation space can be traced back to various authors. First, an emblematic consideration is the following statement: "People make places, more than places make people" (Worpole & Knox, 2007, p.2). This re-underlines the importance of the human factor inside Innovation Spaces. Calvo and De Rosa (2017) argue that the proactive involvement of citizens in the design of a space contributes to the reinforcement of the long-term relationship between people and places. This can be considered "co-design", such as the approach of integrating people from different backgrounds and levels of expertise into the creative process (Sanders & Stappers, 2008). The idea of co-design becomes a "vehicle to engage citizenship towards the transformation of our environment" (Calvo and De Rosa, 2017).

Fit with ecosystem

The aspect to fit with the ecosystem was underlined by Professor Merialdo from InnovAction Lab, stating that the only way to achieve an impact on society is by creating a fit into an overall ecosystem. He stressed the importance to operate a system level, where each idea can grow by networking with similar initiatives. In this regard, he stated, "the self-referential garden is no solution" (Merialdo P., personal communication 2020). In addition, Björsne from BioVentureHub stated that the main goal of the hub is to strengthen the ecosystem as a whole. He uses the expression to "go from an ego system to an ecosystem". This will be a win-win solution for everybody who is in the ecosystem (Björsne M., personal communication 2020). Skandia Future Center's respondent expressed the implication of navigating in complex global dynamics that constantly change. This requires navigational skills and the ability to readapt to the surrounding environment. The concept of a future center has to be constantly challenged and rethought; otherwise, it becomes obsolete (Edvinsson L., personal communication, 2020).

As Peschl & Fundneider (2012) discuss, it is essential to provide an ecosystem and environment that enables the creation of innovation. These "Enabling spaces" finds its foundation on the concept of "ba" that explains how creative activities can be either hindered or stimulated (Nonaka, Toyama, 2003: p. 6f). The key idea of the "enabling space approach" is that almost any innovation process that intends to encourage the creation of innovation should start by observing, investigating and deeply understanding the object of innovation and its systemic environment (Peschl & Fundneider 2012).

Circular economy

The core idea of BioVentureHub is to use existing resources in an alternative way by leveraging on the existing capacity of AstraZeneca, in terms of both financial and human resources. This includes sharing capabilities and instruments. It is described as a circular economy applied to the industry (Björsne M., personal communication 2020). Also the Learning Lab focuses on the idea of reusing material and finding a second use, although the material inside the lab is not considered to sustainable in terms of techniques and electricity utilized (Björk J., personal communication 2020).

Summary of sphere *Impact on Society & Sustainability*

For the majority of the "aspects" of this theme, there is accordance with relevant literature. Different authors consider the role of Innovation Spaces as essential in finding systemic solutions encouraging social change. The first "aspect" consists in the focus of Innovation Spaces on societal challenges and innovation, to finally realize an impact on society. It was observed as a key feature of most spaces, and almost all recognized the necessity to have an impact on society by solving societal challenges. The concept of societal innovation was not exactly found in literature about Innovation Spaces, but similar notions of collaborative and sustainable solutions as well as eco-innovations appeared relevant relating to what emerged from the interviews. The second "aspect" concerns the involvement of all stakeholders, including most importantly the community, and regarded most Innovation Spaces of the case study. Existing literature finds that the proactive involvement of citizens can reinforce the relationship between people and places and finally transform our environment. The third "aspect" is the fit with the ecosystem. It refers to the need to operate at a system level, to encourage networking and adapt to the evolving and dynamic external environment. A similar concept found in literature is the one of "enabling spaces" that provide an ecosystem and environment that fosters the creation of innovation. The last "aspect" of the idea of circular and sharing economy inside Innovation Spaces was observed only in two Swedish cases and has not been found in existing theory of the topic.

5.3 Innovation & Technology

The last sphere of *innovation and technology* is fundamental inside Innovation Spaces. The latest trends acknowledged also in existing literature regarding this theme are mainly two. The first is that innovation is always more conceived and generated in the form of open innovation. Chesbrough (2003) defines this as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively." It implies that innovation takes place though experiments and out-sourcing. Furthermore, a second trend is the growing pervasiveness of technology that is driving firms to experiment in balancing organizational desires, technological power and human needs. Technology has re-established how, where and when people connect and communicate. (Wagner & Watch, 2017).

In this context, many authors have also emphasized how the dominant role of technology and the significance of innovation in our society entail the risk to overlook the human role (Magadley & Birdi 2009). Despite this, firms managed to retain the value of human-ness (Wagner & Watch, 2017)

Three main "aspects" regarding this sphere emerged from the interviews with respondents. These are:

1. The need to *prototype and experiment,*
2. The *competence* required to deal with innovation
3. *Creativity and fun* involved in the innovation process

The following table **(Table 6)** presents these above mentioned "aspects" underlining by which respondents they have been mainly discussed.

Aspects / Cases	**Prototype & experiment**	**Specific competence**	**Creative & fun innovation**
Futour (IT)	✓	✓	✓
Skandia Future Center (SE)	✓	✓	✓
InnovAction Lab (IT)	✓	✓	
Castellum Innovation Lab (SE)		✓	✓
BioVentureHub (SE)		✓	
Learning Lab (SE)	✓	✓	✓

Table 6 – "Aspects" of *Innovation & Technology*. Source: Produced by the author

Prototype & experiment

Different respondents mentioned the characteristic of innovation as a prototyping and experimenting activity. Indeed, Martinez (Futour) regards innovation as being a mind-set that allows the capacity of taking risks, of accepting mistakes, and most importantly, of experimenting and prototyping. It includes embracing different perspectives, listening to people's needs and aim at expressing those same needs through innovation. Inside Futour, once the design thinking and participatory processes take place, then prototypes are implemented (Martinez P., personal communication, 2020). Moreover, Edvinsson considers Skandia Future Center as a prototyping and experimenting space where "you can test with lower degree of disturbances and lower degree of risk". It is where you can develop the capacity to change and external knowledge can be incorporate in order to anticipate what is around the corner, being ready to anticipate before "the signal hits you" (Edvinsson L., personal communication, 2020). The final goal of InnovAction Lab is to end up with a concrete prototype of the business project that is the most challenging part due to the common fear of making mistakes (Merialdo P., personal communication 2020). In addition, the Learning Lab is a prototyping space, which aims at investigating, exploring and foreseeing future learning environments. It pushes to think untraditionally and identify new paths (Björk J., personal communication 2020).

According to the secondary data collection, the explorative, experimental and prototyping nature can be identified in many Innovation Spaces. Innovation labs are commonly dedicated to conduct specific types of experiments in which "teams of employees can engage with each other in order to explore and extend their creative thinking beyond and above normal boundaries" (Magadley & Birdi, 2009), (Lewis & Moultrie, 2005). Future Centers provide new ways of thinking in order to prepare for the future in a proactive way. One building block recognized by Dvir et. al (2006) is the tolerance of risk, that allows for out-of-the-box thinking, breaking assumptions and pushing the boundaries of the unknown.

Specific competence

All respondents tackled the topic of the necessity of a specific competence in order to successfully run an innovation space. Martinez talked about the technology inside Futour as a very empowering tool that can substantially leverage knowledge and improve communication. However, he underlines that it requires competence and the choice for the right technology and for the right setting. Sometimes it is good to go back to traditional technologies (Martinez P., personal communication, 2020). Edvinsson referred to the capability necessary inside Skandia Future Center as the ability to "look

around the corner" and the role of technology is to catch signals from the outside as well as from the inside of an enterprise (Edvinsson L., personal communication, 2020).

One of the winning aspects of InnovAction Lab was to build on existing skills that students already had. With the program, they only had to add few elements, but it was mainly a matter of focusing, leveraging and pulling out those capabilities (Merialdo P., personal communication 2020). Lewis and Moultrie (2005) argue that innovation labs provide a set of resources to be dynamically reconfigured dependent on the issue under consideration. This allows the development of dynamic capabilities that evolve and adapt themselves to enable the creation of new value creating strategies.

Ingeström from Castellum Innovation Lab exposed the concept of "digital fitness", meaning that it is important for the people involved to understand the latest technologies and stay updated on their use. He emphasized the rapid pace at which new technological developments take place (Ingeström N., personal communication 2020). In parallel with existing literature, innovation labs are commonly future oriented and need to be perpetually updated against the fast changing technological background. This is not an easy challenge and implies an increasing financial strain on budgets to be continually renewed (Magadley & Birdi, 2009).

BioVentureHub is centered on the combination of different competences and technologies. They blend to co-create new types of innovation and build an overall non-competitive environment. This is the idea that different competences and technologies are combined and can take advantage of each other's skills without jeopardizing commercial interests. This diversity drives innovation. (Björsne M., personal communication 2020). The Learning Lab was built though the collaboration of people from different backgrounds and with specific competences (Björk J., personal communication 2020). Several studies found that innovation generated by teams are likely to be more successful than those by lone inventors are. Designers described some strategies to create a collaborative environment through design team mixing, flexible workplaces in design (Wagner & Watch, 2017).

Creative & fun innovation

Many respondents underlined the creative, fun and engaging aspect of innovative activities. Martinez emphasized the need to find creative solutions to the impelling challenges of our society. Regarding the role of innovation, he said the following statement: "It is many things, it is what I love" (Martinez P., personal communication, 2020). Edvinsson from Skandia Future Center argued that the future of future centers will involve high speed, high intelligence and mostly much fun. He accentuated the importance of fun and trust to counterbalance fear of the unknown (Edvinsson L., personal

communication, 2020). Ingeström conceives innovation as a fun and creative process that adds new value for the company and gets everyone involved (Ingeström N., personal communication 2020). The Learning Lab is intended to challenge and thrill people, to shake them around as if it was a roller coaster and turn the reality upside down (Björk J., personal communication 2020).

Much attention in the last years has been devoted to the creation of spaces to encourage the creative processes and generate innovative ideas. Many emotions and experiences are attributed to space, resulting to the connection between space and imagination (Kristensen, 2004). Other than the physical space, also the organizational climate plays a role in the expression of creativity (Moultrie et al., 2007). Dimensions of organizational climate include challenge, freedom, dynamism, trust, openness, playfulness, conflicts, debate, and risk-taking. Thus, to support creative activities, the physical environment must reflect and enable an organizational climate, which supports creativity. In an organizational setting, creativity can be defined as 'an ongoing process of problem finding, problem solving, and solution implementation activity' (Moultrie et al., 2007).

Summary of sphere *Innovation & Technology*

The last sphere of Innovation Spaces regards the role of innovation and technology inside them. They are acquiring today an ever-increasing dominant and fundamental role in the society. Three main "aspects" emerged in the sphere and found much alignment with the theoretical framework. The first is the need to prototype and experiment inside an Innovation Space. Indeed, most Innovation Spaces appeared to be a testing bed for innovation to take place, where the risk is lower. They imply the ability to accept making mistakes and the capacity to change and anticipate what is around the corner. This experimental and prototyping nature of Innovation Spaces is in accordance with existing theory. A second "aspect" regards having specific competences to run a successful innovation space and manage the technological processes. Indeed, each respondent referred to a precise capability or skill that appeared to be key for the realization of the space. Many referred to a technological competence, to choose the right tools and stay updated. Some denoted the crucial ability necessary in future centers to catch the signals from the external environment and anticipate them. Others talked about the combination of different competences and technologies that can co-create new value together. The last "aspect" is the fun and engaging side of innovative activities. All respondents emphasized the importance of trust, fun and creativity in order to get everyone involved in the innovation process as well as the significance to find new solutions. Much literature has been found about the relationship between innovation and creativity.

5.4 Summary of Data Analysis

The figure below **(Figure 6)** illustrates the three spheres of Innovation Spaces that emerged from the data collection. Each sphere has been presented looking in depth into the "aspects" that appeared most relevant across the case companies. It is important to notice that all respondents touched almost all "aspects" of the sphere. However, the tables of chapter 5 representing the "aspects" **(Table 4, Table 5 and Table 6)** show where the latter have been mainly explored. This does not imply that for sure some "aspects" are not present in one innovation space, but rather that for sake of time limits or due to the construction of the questions and follow-ups, the respondent did not elaborate on that specific aspect that much. Not all "aspects" deemed central for all Innovation Spaces, however, each was investigated in depth by at least two respondents.

The analysis of these "aspects" allowed thoroughly investigating each theme and understanding the different impacts that each case company can have on the respective spheres. The intent was not to score a winner among the different types of Innovation Spaces, but rather to explore the opportunities, challenges and impacts that they entail. It was relevant to identify these "aspects" and analyze which relates more to which space in order to show the uniqueness of each space and at the same time observe some common traits that can be generalized for the spheres.

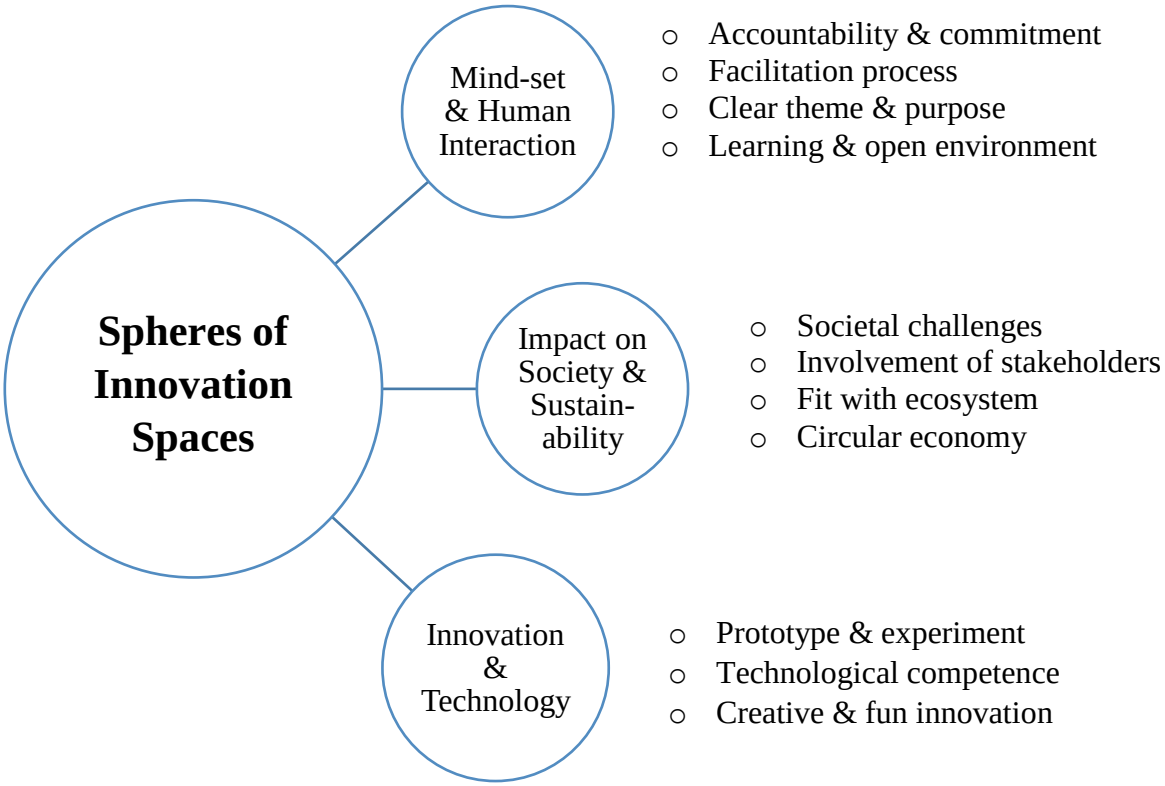

Figure 6 – Summary of Data Analysis. Source: Produced by the author

6. Conclusions and Recommendations

This final chapter will present the conclusion of the research thesis. Once the aim of the study is recalled, the research question is answered. Following, practical implications and suggestions for future researches are reported.

6.1 Answering the Primary Research Question

As described in the introduction (Chapter 1), the uncertain and dynamic environment forces us to face and respond to impelling challenges coming from the social, environmental and economic field. There is the need to find new courses of action (Baedeker et. al., 2014). A pragmatic response is the creation of Innovation Spaces. (Wagner & Watch, 2017).

The primary research question of this thesis is to explore how Innovation Spaces contribute in shaping today's dynamic environment. The goal is to provide implications regarding the opportunities and the challenges that they entail. Due to the broadness of the research question, some further sub-questions have been identified and are constructed as follows:

1. "What mind-set and interaction processes are present inside an Innovation Space?"
2. "Do Innovation Spaces have implications for the society?"
3. "What is the role of technology and innovation inside an Innovation Space?"

In order to answer the research questions stated above, an explorative qualitative type of study was applied. The data collection was made through two sources: semi-structured interviews to different respondents of six case companies of Innovation Spaces and a narrative literature review. Subsequently, the analysis of the primary data collection of interviews followed an Aspect-Thematic Analysis. After having identified three *themes,* a careful analysis of the main "aspects" of each *theme* has been carried on. The themes coincide with the three spheres that were also explored in the literature review. Lastly, the "aspects" have been put in relation to the theoretical framework.

Firstly, conclusions to each sub-research question will be presented through the key findings of the data analysis. Indeed, each research sub-question relates to a specific theme/sphere, respectively to *Mind-set & Human Interaction, Impact on Society & Sustainability* and *Innovation & Technology*. Next, the primary research will be answered.

Sub-question 1: What mind-set and interaction processes are present inside an Innovation Space?

A crucial focus of Innovation Spaces is increasingly considered to be the human factor. This means that much effort and attention has been placed in managing the interaction and communication between the people involved in the activities of an innovation place as well as reaching the ideal mind-set. The emphasis is on the experiences and emotions associated to spaces and on the cognitive processes that result from any innovative activity inside these. In this context, facilitation acquires a key role. It is central to deal with social interaction, steer discussions and ensure the effectiveness of these spaces. Facilitation has this power. Indeed, it is possible to achieve the desired outcomes of collaboration and communication in order to guide decision-making and manage the moods and motivation of members.

Moreover, for the success of any innovation space, participants should have an open and learning attitude that reflects the environment of the space. It should be possible to learn from others and exchange knowledge in order to adopt new perspectives. Only by thinking out-of-the-box, seeking alternative solutions and engaging with others, it can be possible to have an impact on the external environment.

There should also be an accountable and committed mind-set of who manages the innovation space. As Innovation Spaces grow, the more people are involved, the less the single person feels responsible for what is going on. To avoid this, there should be a strong connection to the overall strategy of the organization that has to be clearly communicated to all people. This goes along with a clear scope, objective and purpose of an innovation space that has to be understandable in order to be a source of inspiration. The mind-set of participants and managers of the space as well as the interactions between these cannot be given for granted, but rather have to be carefully guided and monitored.

Sub-question 2: Do Innovation Spaces have implications for the society?

Differently from what expected, not always Innovation Spaces aim at having an impact on the society. In some cases, it is not a priority and in others, it can happen as a result rather than an objective per se. It varies much according to the type of Innovation Spaces. The future centers relevantly focus on societal innovations and innovation labs place much effort to address societal challenges. However, this is not the rule for all.

It is necessary to notice that having an implication for the society implies a broad meaning and interpretation. Some examples, as observed in the data analysis of the case companies, include facing societal challenges, involving all the stakeholders in the activities of an innovation space, the need to fit with the ecosystem and partner with similar initiatives and the application of circular economy and sharing economy. Each respondent of the Innovation Spaces taken in consideration tackled at least two of these "aspects". This means that the answer to the research sub-question is yes. As observed by Professor Merialdo, Innovation Spaces *must* have an impact on society to exist, otherwise they end up being self-referential and with no purpose (Merialdo P., personal communication 2020). Nonetheless, the role of Innovation Spaces is crucial in order to find sustainable systemic solutions that foster a social change.

Sub-question 3: What is the role of technology and innovation inside an Innovation Space?

Innovation Spaces often represent experimental and prototyping spaces where technology has a dominant role and innovation is the key to identify new paths. The combination of traditional and novel technologies can be crucial to the well-functioning of an innovation space. Technology and innovation are the tools that, if leveraged with the right and suited competences, can allow improving the communication and interaction between the people involved and finally find value-creating solutions. It is an aspect that cannot be ignored since the fast pace of technological development implies the need to constantly stay updated on the latest innovations. It requires judgement in the choice of the tool as well as efforts to train on their use.

However, other than being the tools and means necessary for the activities inside these spaces, innovation and technology also have an engaging aspect. They are the basis for creative, fun and involving activities that push to have trust in the generation of new and unknown ideas.

Primary research question: How do Innovation Spaces contribute in shaping today's dynamic environment?

Before answering the primary research question, it is significant to resume the meaning of the *dynamic* environment. The reasoning behind this term stands in the impellent need of long-term sustainable solutions, the increasing emphasis on creativity and innovation as key source of competitive advantage and the mobility of workers due to smart working trends.

Innovation Spaces represent the pragmatic solution to these issues by creating an enabling environment where value is generated through collaboration and communication. It is the place where the three spheres of *Mind-set & Human Interaction*, *Impact on Society & Sustainability* and *Innovation & Technology* simultaneously meet.

As can be observed in the figure below **(figure 7),** where the spheres are presented as overlapped, and as concluded in the previous sub-questions, each one is essential for the effectiveness of the space. The desired outcome is to have a positive *impact on society* by involving the community, creating a network that strengthens the eco-system or by applying concepts of circular and sharing economy. The tools necessary to achieve this goal can be traced back to the sphere of *innovation & technology*, and this requires competence and trust. Lastly, the focus should be on people, their *mind-set and the interactions* that take place. It is crucial for the connection of all spheres. Indeed, in figure 7, it can be noticed how the sphere of *Mind-set & Human Interaction* is in between the other two spheres and is where they interface. For the moment, no name has been given to the two intersections between the spheres.

The success of an innovation space in shaping today's dynamic environment lies in the ability of who manages it to achieve the mind-set and interaction necessary to have an impact on society by leveraging effectively on innovation and technology.

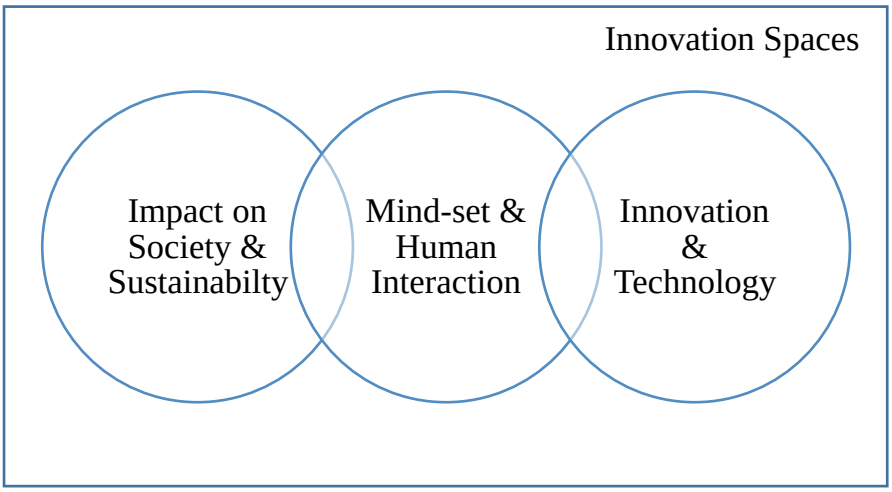

Figure 7 – Three overlapping spheres of Innovation Spaces. Source: Produced by the author

6.2 Answering the Secondary Research Question

For the relevancy of this topic in a crucial moment where the spread of COVID-19 forces the society to practice social distancing and, in most cases, smart working, a further secondary research question was elaborated as follows:

- "What is the impact of remote/smart working on innovative practices that took place inside spaces built ad-hoc and around physical proximity?"

For the sake of a secondary research question, that was not the main purpose of the research, and due to limited amount of data collected, the analysis was carried out in a different manner than the primary research question. Indeed, the answers were collected, interpreted and then presented in the conclusions divided with a specific focus on the situation before, during and after Covid-19. This allowed having a complete view in the process of transition to remote working.

Before Covid-19

A small part of these Innovation Spaces were used to smart working as a daily practice before this moment, some to a larger extent by employing virtual and digital tools for facilitation and for online workshops. Other Innovation Spaces already had a form of technological support platform as a preparatory tool before starting the activities inside the space. However, respondents commonly recognized that the clients and stakeholders involved were not familiar with remote working, and found difficulty in shifting to online practices.

During Covid-19

During this transition, the goal of managers of Innovation Spaces has been to reassure the clients and participants and adapt the activities to the need of the moment. One of the first issues was to reflect on how the spaces relying substantially on the physical context could be rendered relevant in this social distancing context. Some realized that the C19 situation brought along, together with some logistical challenges, also some insights for creative ideas and solutions to perform remotely. This, in some way, managed to raise the general enthusiasm and motivation that was key to overcome the common fear of uncertainty. After the initial limbo, most organization appeared open and aware of the advantages of remote/smart working and many clients loved the forms of virtual facilitation. The key appeared to show that there is still contact, relation and co-creation. However, in many practices that normally would involve much collaboration, the level of difficulty to adapt was higher. In addition, the pervasiveness and rising number of online meetings/seminars/activities increased the dullness and tiredness of the online transition as a whole.

After Covid-19

For the future, the hope is that virtual and smart working will remain a relevant part of organizational processes by leveraging on digital tools and productive facilitation. The issue is to identify what could be kept and still be used, and how to encourage it. The idea is that this epidemic situation has trained people into a new mind-set for which the argument that everything is possible holds. It is a matter of seeing things from new perspectives and questioning, "how could it be possible?" instead of "it is not possible". The need for Innovation Spaces arises for this reason. It is where new types of navigation systems allow the anticipation of the future and then to take actions based on that. If simulation of Covid-19 had been done earlier, instead of along the line of reality, maybe anticipation could have been possible but this implies the existence of dedicated Innovation Spaces.

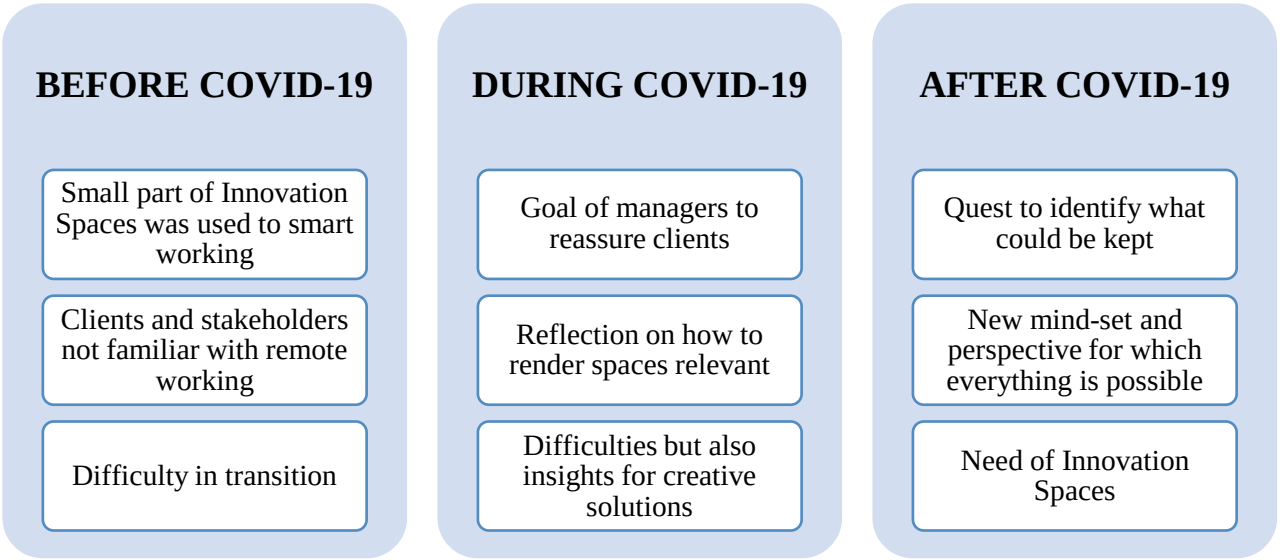

Figure 8 – Summary of Secondary Research Question. Source: Produced by the author

6.3 Practical Implications for Ideal Innovation Space

In this context, what would the innovation space of the future look like? Since the thesis did not have the objective to score a winner among the different types of Innovation Spaces, but rather to explore the different opportunities and challenges that they entail, some winning factors and key features in the creation of the various Innovation Spaces have been established. Thus, it deems relevant to present some guidance in the realization of an *ideal* innovation space.

The covid-19 emergency has given rise to the application of infinite technological possibilities inside workplaces. Smart working is the new trend. However, this pandemic situation has proved that we

need human interaction and face-to-face communication more than anything else. The priority is on people and the social interactions, thus the first sphere. The key words for the after-Covid situation is *flexibility* for the people and *adaptability* of the space. This means that the spaces will have to guarantee an easy redesign and reassemble of the space to meet the unique and changing needs of people according to the situation. However, the purpose for the space has to be clear and understandable to all for it to make sense and the commitment and accountability of who manages the innovation process is essential. Moreover, flexibility in the collaborative and open environment will allow communication across different backgrounds, ages, nationalities etc.

The connection to the external environment has to be carefully thought and monitored. The community and all relevant stakeholders have to be included in the activities as far as possible, kept updated and their needs have to be considered. The same stands for similar spaces and initiatives. As mentioned in earlier chapters (paragraph 4.5.2, paragraph 5.2), the idea is to go "from an ego-system to an eco-system" to strengthen the latter as a whole. Concepts of circular economy and sharing economy will appear to be a great competitive advantage if applied correctly.

Innovation and technology represent the key drivers for the space. The fast pace of development implies the need to continuously train on these aspects. They allow to reason in untraditional ways and push the boundaries of common norms. Also in this case, flexibility and adaptability appear key features to respond effectively to the external environment by leveraging on tools and knowledge. The goal is to finally foster creative and fun innovative activities and find long-run sustainable solutions to the challenges of a dynamic environment.

Ten guidelines that summarize what described above as the ideal Innovation Spaces are:

1. Focus on flexibility for people and adaptability of the space;
2. Find long-run sustainable solutions to the challenges of the dynamic environment;
3. Render the purpose clear and understandable to all;
4. Show commitment and accountability of who manages the space;
5. Engage in creative and fun innovative activities;
6. Encourage a collaborative and open environment;
7. Include the community and relevant stakeholders in the activities as far as possible;
8. Network with similar initiatives of the ecosystem;
9. Train and stay updated on latest technology;
10. Leverage on circular economy and sharing economy.

6.3 Future Research

Innovation Spaces are at their early stages of development and are not yet part of common knowledge. The future for them is to become mainstream and be more commonly applied. For it to happen, further research and exploration of the topic is necessary. Some suggestions on potential future lines of research are reported.

Firstly, the present study has led to the identification of three spheres, where one overlaps with the other two. Further research could investigate over the intersection between these and understand the relationship and dynamics that take place.

Moreover, there are not some specific guidelines on how to proceed with the creation of a particular innovation space. It could be feasible to investigate over only one type of innovation space and finally produce some evidence of winning features that enabled its advancement. It would be interesting also to understand which specific capacities are needed in order to develop an innovation space.

Thirdly, the present thesis was focused on Swedish and Italian-based companies. Due to the limited data collection and for the explorative scope of the research, it was challenging to make a reliable comparison between the two countries. It could be useful for future research to narrow the research question and aim at comparing these two realities. In particular, it would also be interesting to consider expanding geographical boundaries. Since the level of innovative capability varies substantially from country to country, it could be relevant to collect enough global information in order to draw some universal conclusions. In that case, due to the implied complexity, the scope of the study must be redefined.

Moreover, a qualitative analysis is an adequate basis for an exploratory study on the role of Innovation Spaces. However, a following quantitative study taking into consideration some numerical metrics regarding the performance of the spaces could be initiated. It would lead to more objective results, although much more narrow in the scope. Some exemplifying measurements could strictly relate to the physical design of the space, such as the number of windows, doors, lights, seating arrangements that contribute to the comfort of the participants and to the climate of the place.

Lastly, most Innovation Spaces that served as cases for this research are at their early stages of development and some were just taking their first steps. Others have instead substantially matured. It would be interesting to replicate the study over the same Innovation Spaces in the future and observe their implications over time and how they have evolved.

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8. Appendix

8.1 Appendix 1: Interview Guide

Introduction

1. Can you briefly introduce yourself? Your job and what you take care of at the moment?
2. Can you talk more in detail about you experience with the innovation space xxx?

Innovation Space xxx

3. What was essential in the creation of xxx (innovation space)?
4. What were the main challenges you had to face in the creation of xxx?

Role and Impact of Innovation Spaces

5. What is the role of these types of Innovation Spaces today and what are characteristics that define it?
6. What do you think is the role of facilitators inside it?
7. And what about the role of technology?
8. For the thesis, I am studying many types of Innovation Spaces, such as innovation labs, innovation centers, living labs and many more. What do you think about having dedicated spaces for innovation?
9. Do you believe the main concepts of xxx could be realized in many normal workplaces/universities/schools? If yes, how?

Impact on Society

10. I am also interested in studying how these spaces can create a sustainable impact for the society, what do you think this type of innovation space entails for the society? Does it have an impact? How can it create it?
11. What is the greatest benefits and positive impact that xxx create?
12. Do you think xxx can be also considered a sustainability platform?
13. Sustainable development can be of an economic, social and environmental sphere. Which aspect touched by xxx do you think is the most important?
14. How important is it to achieve sustainable solutions?

Conclusion

15. What do you think is the future of xxx?
16. What does innovation mean to you?

8.2 Appendix 2: Interview Guide Follow-up

Good Evening,

I hope everything is going well since the last interview we had.

Since I find myself writing a thesis around Innovation Spaces in a very crucial moment where social distancing forces us to practice smart working due to the spread of COVID-19, I thought it would be very relevant to consider also this aspect in my thesis project. In particular, the goal is to understand what is the impact of remote/smart working on innovative practices that took place inside spaces built ad-hoc and around physical proximity in many cases.

I would kindly like to make a follow-up with you regarding this topic and it would be very much appreciated if you could take some minutes to read the questions and answer by written mail, or if you prefer making a skype/zoom call.

The questions are divided with a specific focus on the situation before, during and after COVID-19 in order to have a complete view in the process of transition to remote working. They are presented in order to provide some guidance and do not have to be strictly answered. For sake of clarity, I will provide below a definition of Smart Working.

The term “Smart Working” corresponds to “non-conventional organizational models characterized by higher flexibility and autonomy in the choice of working spaces, time and tools, and that provides all employees of an organization with the best working conditions to accomplish their tasks” (Gastaldi, Corso, Raguseo, Neirotti, Paolucci & Martini, 2014)

- PAST: Were you practicing Smart Working in the innovation space before the emergence of COVID-19? Were you ready to implement changes of smart/remote working as a daily activity? Did you have the tools, structures and processes to implement such switch and skills to manage it?
- PRESENT: How did you reorganize the activities in order to manage the transition to remote working? In particular, how did you cope with the motivation, uncertainty and spirit of remote workers? (online training opportunities, wellness tutorials) What about the challenge of achieving team collaboration and enabling an open and inclusive business culture surrounding this transition?
- FUTURE: In your opinion, what will be learnings and knowledge gained after this forced remote/smart working? What will be kept and what will be discarded?

Thankyou very much for your help, time and insightful answers for my thesis project,

Best regards,

Lavinia Carrese

P.S. The questions have been developed after consulting the following articles:

Gastaldi, L., Corso, M., Raguseo, E., Neirotti, P., Paolucci, E., & Martini, A. (2014). Smart working: Rethinking work practices to leverage employees' innovation potential. In Proceedings of the 15th International CINet Conference (Vol. 100).

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8.3 Appendix 3: Introductory Email Text Sent to Respondents

Good Morning,

I'm Lavinia Carrese, an Innovation Management student from the University of Gothenburg. I am currently writing my thesis at "The ( ) Space".

Per Östling told me that you would be available to help me with my Master Thesis on Innovation Spaces and their relationship with Sustainable Development. I would kindly like to have an interview with you.

Thankyou in advance.

Best regards,

Lavinia Carrese

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List of Abbreviations

CEO: Chief Executive Officer

EU: European Union

HR: Human Resources

ICT: Information and Communication Technology

R&D: Research & Development

SME: Small and Medium-sized Enterprise

SWC: Smart Working Centers

UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

GM0461 Master Degree Project in Innovation and Industrial Management

LUISS Guido Carli
LIBERA UNIVERSITÀ INTERNAZIONALE DEGLI STUDI SOCIALI

Master Degree Project in Management

Innovation Spaces for a Sustainable Survival

An exploratory multiple case study on the role of Innovation Spaces in shaping today's dynamic environment

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GRADUATE SCHOOL

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Academic Year: 2019/2020

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Master Thesis Summary

Introduction

In my bachelor thesis, I have explored to which level disruptive innovations can play a key role in creating a sustainable development that is ecological, social and economic value. I concluded that these kinds of innovation have the power to change the dynamics and the existing standards of the reality we live in, creating new ones. The more radical the idea, the more outstanding the outturn can be, and attempting to pursue it in a sustainable direction will indeed be a key to sustainable development.

I now ask myself: "What is the space where these two concepts, innovation and sustainable development, can coexist and mutually grow?" In this context, Innovation Spaces play an important role. The only way to achieve a sustainable competitive advantage is by creating spaces that will foster the right conditions to develop new ideas and innovations (Liedtke et. al., 2012), (Lawson & Samson, 2001). Indeed, Innovation Spaces have the potential to enable interaction and collaboration, reinforce corporate values and support group creativity. They represent today a growing portfolio of workspaces cradling the process of innovation and every-day experimentation (Moultrie et. al, 2007).

Thus, the thesis has the objective to study the ability of Innovation Spaces to change current practices and rules of the game, by fostering the co-creation of participatory and sustainable innovative processes. First, the focus will be on analyzing different types of Innovation Spaces and understanding the key aspects and challenges of each one as well as their unique characteristics. Then, the study will take a broader view and inquire on what these spaces entail for the society and ecosystem where they are located, as well as the role of people and technology inside. The primary research question will be the following:

- "How do Innovation Spaces contribute in shaping today's dynamic environment?"

The term *dynamic* has been chosen to describe today's environment due to the main three trends identified in the problem setting of the topic. Firstly, the pressures from the social, environmental and economic field push for need of business transformation and long-term sustainable solutions to survive. Sustainability is considered a prerequisite for any product and service. Secondly, there is an increasing emphasis on creativity and innovation as key source of competitive advantage. Thirdly, people are not bound to a certain place but there is an increasing mobility of workers and trends of smart working are emerging.

From these considerations of the primary research question, derives the title of the thesis. “Innovation Spaces for a Sustainable Survival” implies that these dedicated spaces represent the long-run solution that will allow the organization and people involved to survive to the above-mentioned *dynamic* environment.

Due to the broadness of the primary research question and for sake of simplicity, the following research sub questions have been developed:

1. “What mind-set and interaction processes are present inside an Innovation Space?”
2. “Do Innovation Spaces have implications for the society?”
3. “What is the role of technology and innovation inside an Innovation Space?”

Moreover, it is relevant to notice that I found myself writing a master thesis around Innovation Spaces in a very crucial moment where the spread of COVID-19 forces the society to practice social distancing and, in most cases, smart working. From this situation, it appeared logical and of substantial relevance, taking into consideration this aspect in my thesis project. Thus, a secondary research question followed from this reasoning:

- “What is the impact of remote/smart working on innovative practices that took place inside spaces built ad-hoc and around physical proximity?”

Theoretical Framework

The theoretical framework was divided in three main parts. The first part aimed at understanding what Innovation Spaces are by understanding its relationship with creativity and by analyzing the main dimensions. Indeed, Innovation Spaces are open, flexible and contextually responsive environments. They aim at strengthening interactions, communication and collaboration, opening up new ways of sharing and expressing new ideas. They represent an important part of the innovation process of an organization and indeed, they reinforce innovation performance and corporate values of that organization. Moreover, much literature found that having dedicated spaces for innovation can increase the ability to generate ideas and can facilitate the creative process. In addition, some dimensions of Innovation Spaces that support the innovative process are the following: *Collaboration and Communication Enabling spaces, Modifiable space, Intellectual spaces, Attracting spaces and Value reflecting spaces.*

In the second part, the four different types of Innovation Spaces that appeared more relevant for the study were descried in detail. *Innovation laboratories* are purpose-built physical environments with

collaborative workspaces in which groups of employees can engage with each other in order to explore and extend their creative thinking beyond and above normal boundaries. *Future centers* are considered an urban innovation engine of the city and aim at facilitating the working environment and helping organizations prepare for the future in a proactive way. The *Living lab research infrastructure* is a user-centric innovation environment built on every-day practice and research which goal is to create sustainable value. They are crucial for fostering eco-innovations since they aim at exploring an approach that should lead to long-term effective sustainable innovations by engaging users rather than limiting them. *Smart Working Centers* consist in shared and collaborative workplace where a variety of users can flexibly access and work, individually or in teams, at a distance from their organizations' office building.

In the last part of the theoretical framework, the three main spheres of Innovation Spaces have been presented, analyzing the impact that the spaces have in each. The first sphere is the *Mind-set & Human Interaction* that focuses on the role of people. The are two key issues in this sphere. The first is the enabling approach, consisting in acquiring virtues of openness, the ability to radically question ourselves, learning to listen, closely observe and let things change us and impress us. The second issue lies in the importance of facilitation as the key factor to achieve the right interaction and collaborations that ensure the effectiveness of Innovation Spaces. The second sphere is the *Impact on Society & Sustainability*, which regards the relationship with the external environment. Sustainability is a prerequisite for any product or service and "place" is considered an essential aspect in shaping social identity, identification and cohesion. The last sphere of *Innovation & Technology* regards two pillars; the model of open innovation developed by Chesbrough that considers both inflows and outflows of knowledge in the innovation funnel, and the idea that technology is always more pervasive and dominant inside Innovation Spaces.

Methodology

The methods chosen to conduct this study consist in a qualitative multiple-case study with an inductive approach for what regards the research strategy. An inductive approach will seek to create a theory based on empirical findings. The qualitative study is better suited to answer the research question in order to have a more in-depth understanding on the topic from more point of views. The research design is an exploratory multiple case study where different cases are investigated and compared in an area that is relatively unexplored.

The research contains two different sources of data, a primary and a secondary data collection. The initial data was collected though a narrative literature review, which represents the basis to understand the focus of the primary data collection, such as semi-structured interviews. The data collection followed an *iterative process*. It started with the secondary data collection of literature review, followed by a first round of data collected through interviews, then a further literature review took place and a final round of interviews terminated the data collection process. The sake of the two rounds of interviews can be traced back to the need to address a primary and a secondary research question. Indeed, each round was focused to answer each one.

The analysis of the data collected for the primary research question followed an aspect-thematic analysis. The figure below **(Figure 5)** describes the process outlined into the five main steps.

Figure 1 – Aspect-Thematic analysis process. Source: Produced by the author

For what regards the second round of data collection to address the secondary research question on the topic of remote/smart working, the data analysis process followed a different approach. Due to limited amount of data collected, it was impracticable to apply the same analysis method. Moreover, for the sake of a secondary research question, it also appeared not so relevant for the sake of the research. Thus, the data was collected, interpreted and used then in the conclusions to answer the secondary research question (Chapter 6 – paragraph 6.2).

Empirical Findings and Data Analysis

The figure below **(Figure 6)** illustrates the three spheres/themes of Innovation Spaces that emerged from the data collection. Each sphere has been presented looking in depth into the “aspects” that appeared most relevant across the case companies. Not all “aspects” deemed central for all Innovation Spaces, however, each was investigated in depth by at least two respondents. The analysis of these “aspects” allowed thoroughly investigating each theme and understanding the different impacts that each case company can have on the respective spheres. The intent was not to score a winner among the different types of Innovation Spaces, but rather to explore the opportunities, challenges and impacts that they entail. It was relevant to identify these “aspects” in order to show the uniqueness of each space and at the same time observe some common traits that can be generalized for the spheres.

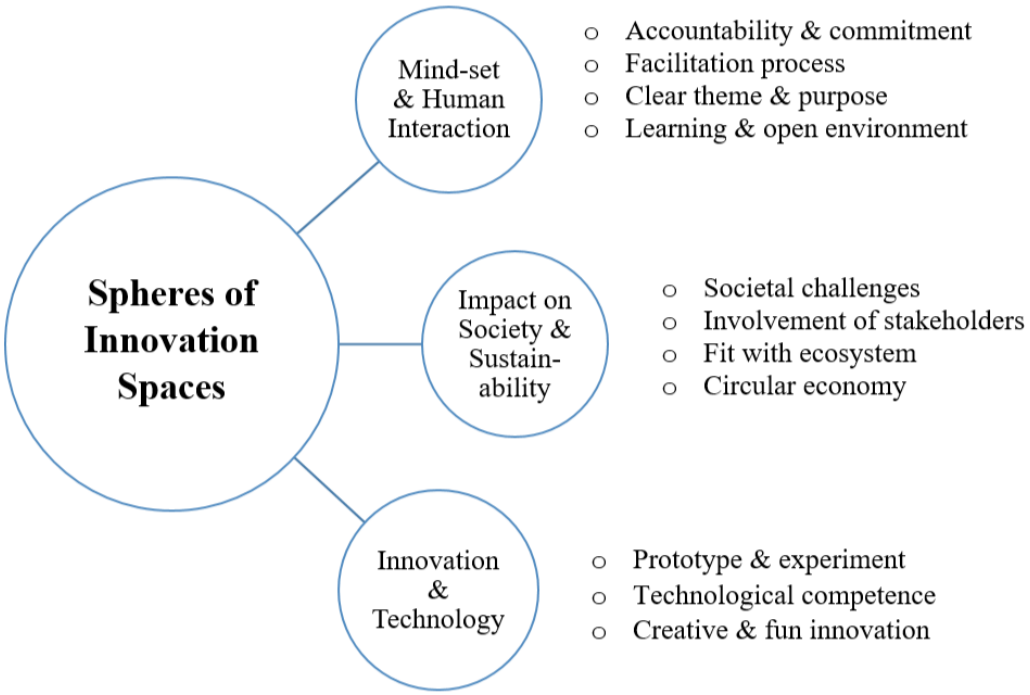

Figure 2 – Summary of Data Analysis. Source: Produced by the author

Sphere Mind-set & Human Interaction

The evidences found in the primary data collection through the respondents appear to be aligned to the existing literature. Indeed, according to the latter, the focus of Innovation Spaces has been mainly on strengthening the humanness and encouraging interaction between different actors.

The first "aspect" of accountability & commitment was looked at by the two Italian firms, such as Futour and InnovAction Lab, and implies for a complete dedication of who is managing the innovation space. Moreover, as noticed both in interviews and literature, it entails that the commitment to innovative practices should be aligned and coherent to the overall strategy of the organization. The second "aspect" of facilitation processes was mainly observed in the two future centers (Futour and Skandia Future Center) as well as in the Hub (BioVentureHub). All underlined the importance to manage the social interactions and communication inside the space, in line with theory that emphasizes the central role of facilitation processes. The third "aspect" of the existence of a clear theme and purpose of the innovation space was argued by three Swedish case companies. Having an underpinning strategic intent is considered a starting point for the creation of any innovation space. The fourth "aspect" of the learning and open environment inside an innovation space was the one that was emphasized by most respondents. Almost any space is open to whoever wants to participate, made exception for those places that are open only to those specifically involved in the innovative activities of the firm. The learning attitude implies that the spaces represent an opportunity to train, learn from others and think from new perspectives. In accordance to the theory,

openness is a driver for innovation and is influencing the way Innovation Spaces are designed. The aspect of learning environment was not specifically found in existing literature.

Sphere Impact on Society & Sustainability

For the majority of the "aspects" of this theme, there is accordance with relevant literature. Different authors consider the role of Innovation Spaces as essential in finding systemic solutions encouraging social change. The first "aspect" consists in the focus of Innovation Spaces on societal challenges and innovation, to finally realize an impact on society. It was observed as a key feature of most spaces, and almost all recognized the necessity to have an impact on society by solving societal challenges. The concept of societal innovation was not exactly found in literature about Innovation Spaces, but similar notions of collaborative and sustainable solutions as well as eco-innovations appeared relevant relating to what emerged from the interviews. The second "aspect" concerns the involvement of all stakeholders, including most importantly the community, and regarded most Innovation Spaces of the case study. Existing literature finds that the proactive involvement of citizens can reinforce the relationship between people and places and finally transform our environment. The third "aspect" is the fit with the ecosystem. It refers to the need to operate at a system level, to encourage networking and adapt to the evolving and dynamic external environment. A similar concept found in literature is the one of "enabling spaces" that provide an ecosystem and environment that fosters the creation of innovation. The last "aspect" of the idea of circular and sharing economy inside Innovation Spaces was observed only in two Swedish cases and has not been found in existing theory of the topic.

Sphere Innovation & Technology

The last sphere of Innovation Spaces regards the role of innovation and technology inside them. They are acquiring today an ever-increasing dominant and fundamental role in the society. Three main "aspects" emerged in the sphere and found much alignment with the theoretical framework. The first is the need to prototype and experiment inside an Innovation Space. Indeed, most Innovation Spaces appeared to be a testing bed for innovation to take place, where the risk is lower. They imply the ability to accept making mistakes and the capacity to change and anticipate what is around the corner. This experimental and prototyping nature of Innovation Spaces is in accordance with existing theory. A second "aspect" regards having specific competences to run a successful innovation space and manage the technological processes. Indeed, each respondent referred to a precise capability or skill that appeared to be key for the realization of the space. Many referred to a technological competence, to choose the right tools and stay updated. Some denoted the crucial ability necessary in future centers to catch the signals from the external environment and anticipate them. Others talked about the combination of different competences and technologies that can co-create new value together. The

last “aspect” is the fun and engaging side of innovative activities. All respondents emphasized the importance of trust, fun and creativity in order to get everyone involved in the innovation process as well as the significance to find new solutions.

Conclusions

Answering the Primary Research Question

Conclusions to each sub-research question will be presented through the key findings of the data analysis. Indeed, each research sub-question relates to a specific theme/sphere, respectively to *Mind-set & Human Interaction, Impact on Society & Sustainability* and *Innovation & Technology*. Next, the primary research will be answered.

Sub-question 1: What mind-set and interaction processes are present inside an Innovation Space?

A crucial focus of Innovation Spaces is increasingly considered to be the human factor. This means that much effort and attention has been placed in managing the interaction and communication between the people involved in the activities of an innovation place as well as reaching the ideal mind-set. The emphasis is on the experiences and emotions associated to spaces and on the cognitive processes that result from any innovative activity inside these. In this context, facilitation acquires a key role. It is central to deal with social interaction, steer discussions and ensure the effectiveness of these spaces. Facilitation has this power. Indeed, it is possible to achieve the desired outcomes of collaboration and communication in order to guide decision-making and manage the moods and motivation of members.

Moreover, for the success of any innovation space, participants should have an open and learning attitude that reflects the environment of the space. It should be possible to learn from others and exchange knowledge in order to adopt new perspectives. Only by thinking out-of-the-box, seeking alternative solutions and engaging with others, it can be possible to have an impact on the external environment.

There should also be an accountable and committed mind-set of who manages the innovation space. As Innovation Spaces grow, the more people are involved, the less the single person feels responsible for what is going on. To avoid this, there should be a strong connection to the overall strategy of the organization that has to be clearly communicated to all people. This goes along with a clear scope, objective and purpose of an innovation space that has to be understandable in order to be a source of

inspiration. The mind-set of participants and managers of the space as well as the interactions between these cannot be given for granted, but rather have to be carefully guided and monitored.

Sub-question 2: Do Innovation Spaces have implications for the society?

Differently from what expected, not always Innovation Spaces aim at having an impact on the society. In some cases, it is not a priority and in others, it can happen as a result rather than an objective per se. It varies much according to the type of Innovation Spaces. The future centers relevantly focus on societal innovations and innovation labs place much effort to address societal challenges. However, this is not the rule for all.

It is necessary to notice that having an implication for the society implies a broad meaning and interpretation. Some examples, as observed in the data analysis of the case companies, include facing societal challenges, involving all the stakeholders in the activities of an innovation space, the need to fit with the ecosystem and partner with similar initiatives and the application of circular economy and sharing economy. Each respondent of the Innovation Spaces taken in consideration tackled at least two of these "aspects". This means that the answer to the research sub-question is yes. As observed by Professor Merialdo, Innovation Spaces *must* have an impact on society to exist, otherwise they end up being self-referential and with no purpose (Merialdo P., personal communication 2020). Nonetheless, the role of Innovation Spaces is crucial in order to find sustainable systemic solutions that foster a social change.

Sub-question 3: What is the role of technology and innovation inside an Innovation Space?

Innovation Spaces often represent experimental and prototyping spaces where technology has a dominant role and innovation is the key to identify new paths. The combination of traditional and novel technologies can be crucial to the well-functioning of an innovation space. Technology and innovation are the tools that, if leveraged with the right and suited competences, can allow improving the communication and interaction between the people involved and finally find value-creating solutions. It is an aspect that cannot be ignored since the fast pace of technological development implies the need to constantly stay updated on the latest innovations. It requires judgement in the choice of the tool as well as efforts to train on their use.

However, other than being the tools and means necessary for the activities inside these spaces, innovation and technology also have an engaging aspect. They are the basis for creative, fun and involving activities that push to have trust in the generation of new and unknown ideas.

Primary research question: How do Innovation Spaces contribute in shaping today's dynamic environment?

Before answering the primary research question, it is significant to resume the meaning of the *dynamic* environment. The reasoning behind this term stands in the impellent need of long-term sustainable solutions, the increasing emphasis on creativity and innovation as key source of competitive advantage and the mobility of workers due to smart working trends.

Innovation Spaces represent the pragmatic solution to these issues by creating an enabling environment where value is generated through collaboration and communication. It is the place where the three spheres of *Mind-set & Human Interaction*, *Impact on Society & Sustainability* and *Innovation & Technology* simultaneously meet.

As can be observed in the figure below **(figure 7),** where the spheres are presented as overlapped, and as concluded in the previous sub-questions, each one is essential for the effectiveness of the space. The desired outcome is to have a positive *impact on society* by involving the community, creating a network that strengthens the eco-system or by applying concepts of circular and sharing economy. The tools necessary to achieve this goal can be traced back to the sphere of *innovation & technology*, and this requires competence and trust. Lastly, the focus should be on people, their *mind-set and the interactions* that take place. It is crucial for the connection of all spheres. Indeed, in figure 7, it can be noticed how the sphere of *Mind-set & Human Interaction* is in between the other two spheres and is where they interface. For the moment, no name has been given to the two intersections between the spheres. The success of an innovation space in shaping today's dynamic environment lies in the ability of who manages it to achieve the mind-set and interaction necessary to have an impact on society by leveraging effectively on innovation and technology.

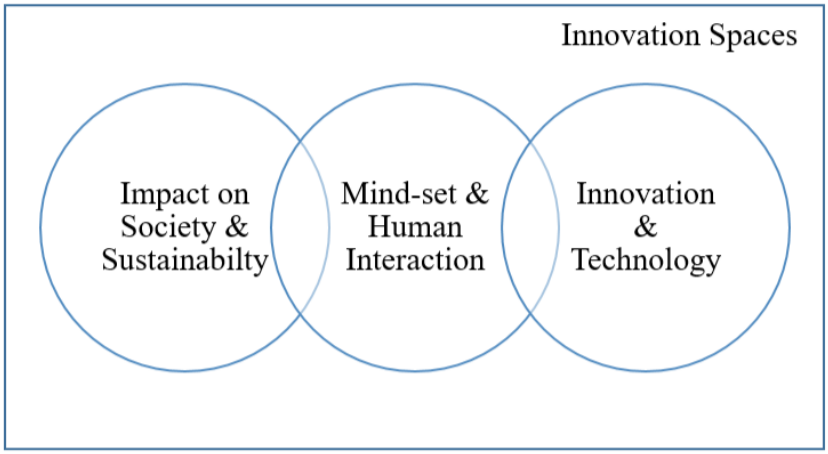

Figure 3 – Three overlapping spheres of Innovation Spaces. Source: Produced by the author

Answering the Secondary Research Question

For the relevancy of this topic in a crucial moment where the spread of COVID-19 forces the society to practice social distancing and, in most cases, smart working, a further secondary research question was elaborated as follows:

- "What is the impact of remote/smart working on innovative practices that took place inside spaces built ad-hoc and around physical proximity?"

For the sake of a secondary research question, that was not the main purpose of the research, and due to limited amount of data collected, the analysis was carried out in a different manner than the primary research question. Indeed, the answers were collected, interpreted and then presented in the conclusions divided with a specific focus on the situation before, during and after Covid-19. This allowed having a complete view in the process of transition to remote working.

Before Covid-19

A small part of these Innovation Spaces were used to smart working as a daily practice before this moment, some to a larger extent by employing virtual and digital tools for facilitation and for online workshops. Other Innovation Spaces already had a form of technological support platform as a preparatory tool before starting the activities inside the space. However, respondents commonly recognized that the clients and stakeholders involved were not familiar with remote working, and found difficulty in shifting to online practices.

During Covid-19

During this transition, the goal of managers of Innovation Spaces has been to reassure the clients and participants and adapt the activities to the need of the moment. One of the first issues was to reflect on how the spaces relying substantially on the physical context could be rendered relevant in this social distancing context. Some realized that the C19 situation brought along, together with some logistical challenges, also some insights for creative ideas and solutions to perform remotely. This, in some way, managed to raise the general enthusiasm and motivation that was key to overcome the common fear of uncertainty. After the initial limbo, most organization appeared open and aware of the advantages of remote/smart working and many clients loved the forms of virtual facilitation. The key appeared to show that there is still contact, relation and co-creation. However, in many practices that normally would involve much collaboration, the level of difficulty to adapt was higher. In addition, the pervasiveness and rising number of online meetings/seminars/activities increased the dullness and tiredness of the online transition as a whole.

After Covid-19

For the future, the hope is that virtual and smart working will remain a relevant part of organizational processes by leveraging on digital tools and productive facilitation. The issue is to identify what could be kept and still be used, and how to encourage it. The idea is that this epidemic situation has trained people into a new mind-set for which the argument that everything is possible holds. It is a matter of seeing things from new perspectives and questioning, "how could it be possible?" instead of "it is not possible". The need for Innovation Spaces arises for this reason. It is where new types of navigation systems allow the anticipation of the future and then to take actions based on that. If simulation of Covid-19 had been done earlier, instead of along the line of reality, maybe anticipation could have been possible but this implies the existence of dedicated Innovation Spaces.

Practical Implications for Ideal Innovation Space

In this context, what would the innovation space of the future look like? Guidance regarding the realization of an *ideal* innovation space will be provided.

The covid-19 emergency has given rise to the application of infinite technological possibilities inside workplaces. However, this pandemic situation has proved that we need human interaction and face-to-face communication more than anything else. The priority is on people and the social interactions, thus the first sphere. The key words for the after-Covid situation is *flexibility* for the people and *adaptability* of the space. This means that the spaces will have to guarantee an easy redesign and reassemble of the space to meet the unique and changing needs of people according to the situation.

Ten guidelines that summarize the creation of the ideal Innovation Spaces are:

1. Focus on flexibility for people and adaptability of the space;
2. Find long-run sustainable solutions to the challenges of the dynamic environment;
3. Render the purpose clear and understandable to all;
4. Show commitment and accountability of who manages the space;
5. Engage in creative and fun innovative activities;
6. Encourage a collaborative and open environment;
7. Include the community and relevant stakeholders in the activities as far as possible;
8. Network with similar initiatives of the ecosystem;
9. Train and stay updated on latest technology;
10. Leverage on circular economy and sharing economy.

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