UNIVERSITÉ DU QUÉBEC À MONTRÉAL

THE SPACE FOR INNOVATION

A COMPREHENSIVE REVIEW

THESIS

PRESENTED

AS PARTIAL REQUIREMENT FOR

THE MASTERS IN ENVIRONMENTAL DESIGN

BY

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FOREWORD

The study of space typologies cannot be approached without a full understanding of what innovation is, what are its fundamental characteristics and how research and literature about it are advancing.

We live in a time of accelerated change, which facilitates the integration of new parties to the innovation ecosystem. Today innovation has become a popular term and a common word, and its processes, methods and meanings are being re-evaluated.

As mentioned by Wang (2009), researchers are increasingly adopting interdisciplinary approaches to address complex problems, so that solutions do not come from a single source.

Science has evolved, so have the technology and research that come from scientific and technological labs, complementing each other.

Today an emerging trend of new business models, entrepreneurs, services and, of course, new inventions are trying to reach the market. Thus, countless disciplines and stakeholders have started redefining space functions, making them bigger and offering new possibilities by reconfiguring their existing limits.

That is how, researchers like Amabile, Conti, Heather, Lazenby and Herron (1996) have developed instruments like "keys" to stimulate and evaluate barriers for creativity at the workplace, understanding that all innovation begins with creative ideas, but at the same time that it is important to consider what are the tools needed to promote the successful implementation of an idea.

It is feasible to think that the environment in organization and space can influence innovation, and they are becoming elements that may trigger, generate or affect innovation potential.

Innovation that develops in a spatial context where proximity, contact, support and the "capture of value" experience exists is important, as is the geographic adjacency and territorial space mentioned as the learning regions by Healy and Morgan (2012).

LIST OF FIGURES

LIST OF ABBREVIATIONS, SYMBOLS AND ACRONYMS

CETEC	Centro De Tecnología Avanzada Para La Producción
CIC	Cambridge Collaborative Innovation Center
CRC	Corporate Research Centers
DF	Design Factory
DIY	Do It Yourself
FAB-LAB	Fabrication Laboratory
GBPF	Government Buildings and Public Facilities
HI	Harvard Innovation Lab
I-lab	Innovation Laboratories
I-ROOM	Innovation Room
IDIT	El Instituto De Diseño E Innovación Tecnológica
JCIT	The Jockey Club Innovation Tower
LSCI	Local Spaces of Collaborative Innovation
MIT	Massachusetts Institute of Technology
NIBS	National Institute of Building Sciences
OECD	The Organization for Economic Co-operation and Development
SSFI	Reduced Spaces for Innovation
RSTP	Research Science Technology Bio Parks and Technopolis
SLEI	Specialized Learning Environments of Innovation
OSCI	Open Social and Cultural Spaces for Innovation
SFI	Space for Innovation
SME	Small and Medium Enterprises
SNI	The National Innovation System
TEC	Instituto Tecnológico de Monterrey
TED	Technology, Entertainment, Design Talks
URCS	University Research Centers/innovation centers and campus

TABLE OF CONTENTS

RÉSUMÉ

Il s'agit d'une liste complète et d'une revue de la littérature qui propose une classification des espaces considérés pour l'innovation, fonde sur l'hypothèse que la conception d'espaces innovateurs n'est pas la même chose que le design des environnements pour développer l'innovation

Au cours des 25 dernières années, les lieux créés spécifiquement pour favoriser le processus d'innovation ont vu leur nombre augmenter de façon exponentielle. En plus des régions ou des zones « créatives », est apparue une grande variété d'incubateurs, de laboratoires, des centres d'apprentissage, d'espaces de co-working etc., dont la fonction première est de stimuler l'innovation.

Si ces espaces spécialisés ont certes déjà fait l'objet de travaux examinant leurs particularités, il ne semble pas encore y avoir d'étude permettant de les saisir de façon globale.

L'objectif est double : il vise d'abord à identifier et classer ces divers types de lieux et il vise ensuite à analyser leurs caractéristiques fondamentales en vue de formuler quelques propositions sur la conception d'espaces pour l'innovation.

MOTS-CLÉS: spaces for innovation, innovation & space, space fostering innovation

ABSTRACT

This is a comprehensive list and a review of the literature that proposes a classification of spaces considered for innovation. It is based on the assumption that the design of innovative spaces is not the same as the design of environments to develop innovation.

Over the last 25 years, the number of places created specifically for the innovation process has increased exponentially. In addition to "creative" regions or zones, there has been a wide variety of incubators, laboratories, learning centers and co-working spaces among others. Whose primary function is to stimulate innovation.

While these specialized spaces have already been the subject of studies examining their particularities, there does not seem to be any study yet to grasp them in a global way.

The objective is twofold: first, to identify and classify these various types of places and then to analyze their fundamental characteristics in order to formulate some proposals on the design of spaces for innovation

KEYWORDS: spaces for innovation, innovation and space, space fostering innovation

INTRODUCTION

In addition to traditional spaces, laboratories and technology centers, a countless number of promoted opportunities exist, thanks to the development of new communication technologies, materials, tools and cooperative processes along with many other aspects.

Several researchers (mentioned in this document) have focused on studying the environment and how architecture affects and promotes innovation development.

Clearly, the past few years witnessed significant growth and interest in this topic

I have identified how some common characteristics of spaces are beginning to emerge, become famous, evolve and consolidate, then becoming market standards, having their dissemination encouraged thanks to the ease of communication and tools to share information available today.

In the past two years alone, the number of scientific papers related to the design of physical spaces for innovation has risen significantly.

It is also remarkable to observe the existence of some elements that are still considered useless from the standpoint of researchers, architects, designers and critics, who sometimes ignore them or do not focus enough on the design and configuration of the spaces they project.

Also, the purpose of this research is to synthesize the literature that up to now is shown to be the most relevant to the interdisciplinary study of spaces to develop innovation. I have included those spaces referring to collaborative processes, from the most conventional to the most original. My premise is that architects and designers have a

greater opportunity to intervene, transform and configure a place that can promote innovative processes.

Based on the review of the literature and categorization of said spaces, as well as my own views and interviews in some of the most representative places, I will seek to organize them and reflect on the most important characteristics they must have, proposing a sort of ecosystem that allows recognizing, determining and understanding how the design of a physical and tangible space may or may not favor innovation.

CHAPTER I

ARGUMENTS

1.1. Introduction

After an extensive review of the literature, I have not found a broad study that addresses the main physical spaces that contribute to innovation development.

The previous research that has been conducted on spaces, their design and qualities have shown different and opposing views in their resolutions and identifications.

Each one of the authors reviewed addresses a particular approach to the space, whether it is from an iconic, creative, social, organizational, or work-oriented point of view. However, as these spaces are practically habitable by any individual, it seems evident that there is not the slightest approximation that allows us to discern the general state of the most relevant spaces where innovation is developed.

On the other hand, a vast literature exists on innovation types and how they are classified, developed, and promoted; Keeley, Walters, Pikkel, and Quinn (2013) and Kelley and Littman (2006) are just some examples.

Thus, it becomes clear that there is a vacuum of information and literature on the definition, meaning, and design of spaces for innovation or SFI, as well as the tools used to promote it.

Even though different authors have focused on studying the design of SFIs, their research

mostly addresses one aspect or one type of space.

For example, one of the most complete studies about SFIs is by Schaeffer (2014) who presents a literary compilation on the matter and evaluates different levels of physical spaces (including both whole and interior regions) and intangible spaces (including individual mental space and the innovation culture in an organization). However, her study does not shed light on every space of the ecosystem.

Several authors have identified different processes, spaces, and territories in very diverse areas related to spaces for innovation like Toker and Gray (2008), O'Donnell (2012); Capdevila (2013), Oksanen, Kaisa, and Ståhle, (2013); Schaeffer (2014); Hawryszkiewycz (2014); Fixson, Seidel, and Bailey (2015); Mojtahedi (2015); and also, Steelcase (2015). But, up to today, none that I have studied has integrally synthesized or classified them.

1.2. Context

1.2.1. Practical relevance

There are new places (inside and outside those same scenarios) that researchers have failed to address in relation to the whole ecosystem of innovation, or, perhaps they have been underestimated.

For example, according to Johansson (2004), Coffee places today, as in the 1800s, are spaces where innovation happens, but they are no longer the space to share ideas, instead they are the spaces in which we make affairs and close business deals to bring them to the market.

In other words, today the importance of Coffees or the concept of "hacking spaces" and how they integrate and reintegrate into this ecosystem is relevant to understand how these

“organic spaces” behave like natural organisms.
Identifying, classifying, or reclassifying these spaces will redirect their relevance and could contribute to future research in architecture, design, and the social sciences, among others.

Understanding the innovation process from idea generation through to commissioning and market launch is important, because it upgrades and reintroduces the importance of SFIs to the ecosystem, and how each one must be considered in these scenarios.

It is critical to encourage all designers and innovation advisors to preserve and create the appropriate interaction and thus promote healthy growth and maintenance of the system.

Classification could help to understand what these spaces are, what their purpose is and how they work, and thus enlighten us on how each of these areas could be planned and designed to become a part of this environment.

Since the classification of these areas could be subjective, broad, and disconnected in some way, given the number of scenarios and spaces that could eventually be identified I will focus on different scales, from macro to small spaces, and some of the main objects surrounding such environments in which a person or group is committed to innovation.

In my research, it is important to note that creating a space for innovation or SFI is not the same as creating an innovative space.

1.2.2. Scientific relevance

According to Katz and Wagner (2014, p.1), “a remarkable shift is occurring in the spatial geography of innovation” and today, in addition to places like Silicon Valley and the suburban corridors of spatially isolated corporate campuses of many companies only accessible by car, the emphasis on the quality of life and the integration of work, housing,

and recreation through new architecture and environment is transforming the landscape. Understanding and identifying the different types of SFIs and their common features could contribute significantly to the stages of the innovation and process documentation.

Understanding what kind of spaces have emerged so far is essential to develop new and better models.

For Trickett (1991) and Sundstrom and Sundstrom (1986), models such as those proposed in the late 1960s, called "burolandschaft" or "office landscaping," commonly known as "open offices" and based on the idea of removing all the walls of a workspace to improve workflow and make it more efficient, have clearly failed.

Today, we can identify several SFIs: innovation regions, innovation districts, innovation clusters, i-labs, university labs, incubators, touchdown spaces, home projects, collectives, co-working labs, co-working spaces, Hackerspaces, Makerspaces, living labs, Fab-Labs, teaching spaces, vocational teaching spaces, learning centers, social spaces, etc.

Therefore, it is important to identify the most relevant categories, types, or structures to fully understand how the physical innovation ecosystem takes shape and which kinds of spaces will contribute to the debate on this issue.

1.2.3. Research question

As previously stated, over the last 25 years, there has been an explosion in the design of regions, districts, labs, incubators, learning centers, social events, and interactive platforms that look to foster the innovation process.

However, it seems that there has not been a comprehensive study that has identified the spaces, how they look and how they relate to this kind of "ecosystem."

With this synthesis, I have asked myself what are the main types of spaces where ideas meet reality and how can they be classified?

CHAPTER II

THEORETICAL FRAMEWORK

2.1. Approach

Different authors have shown a growing interest in studying the phenomenon of space and how it can also encourage creative processes to promote innovation.

Schaeffer (2014, p. 23) mentions the many architects, design consulting agencies, among others, who have expressed their points of view seeking to understand the link between these two aspects.

A very recent study by Wagner and Watch (2017) has identified tendencies in the design of SFIs, influenced by the open and collaborative nature of today's innovation where face-to-face encounters take a new role and technological ubiquity turns them into "testbeds" to explore new architectural designs that fit the needs of today's customers.

That is why my approach to this research focuses mainly on understanding two different points of view: space and innovation, and through them identifying the common points that contribute to the process of designing SFIs.

From an architectural and environmental design approach, I will try to understand what do the spaces look like and which are the most recognized? What are the values and main qualities one must consider in designing SFIs by finding a common point of view on the study of spaces as a part of the process?

On the other hand, I will synthesize the relevant literature regarding these matters, bringing a holistic understanding of the subject of innovation as a determining factor for the configuration of SFIs and how this continuous process involves multiple disciplines and approaches to capture value from the market.

For this reason, and as a part of this document's structure and methodology, the first part will focus on analyzing the present state of the field by reviewing the relevant literature. Based on existing literature, I will formulate my critical view. Furthermore, through the development of this research, I will seek to justify why the study of the physical space is a fundamental variable.

Also from an industrial design point of view, I will pay attention to reduced spaces and objects where teams work and interact to generate ideas and exchange knowledge, with the goal of obtaining tangible results for the industry.

Finally, the research will focus on visits and interviews, and will compile the most relevant information about the types of spaces often used to develop innovation. This process will allow me to compile a classification that allows us to understand where SFIs belong in the system.

I shall conclude by offering some suggestions on the observed characteristics and details that should be considered when projecting new scenarios related to the matter.

2.2. Why innovation in environmental design?

2.2.1. Design of space promotes encounters that may result in new possibilities

According to Johnson (2010), good ideas come from spaces and the networks created in between them.

He argues that "We take ideas from other people, from people we've learned from, from people we run into in the coffee shop, and we stitch them together into new forms and we create something new. That's really where innovation happens" [1].

It is in this sort of environment that people are likely to have new, interesting and unpredictable encounters, which he describes as the "Medici effect."

This name is suggestive of the creative boom in Florence, which led to a historic innovation phenomenon that came when the Medici family brought together people from a wide variety of disciplines—sculptors, poets, philosophers, scientists, painters and architects—all into one place.

This created a determined space, with great concentration of different people and different backgrounds. A space where they could work together and generate new ideas thanks to the intersections of their respective fields.

2.2.2. Space encourages creativity as input for innovation [2]

If we understand creativity as the seed for every innovation, it has been proven that space directly influences the motivation to create new ideas according to (Amabile, Conti, Heather, Lazenby and Herron. 1996).

They also suggest that the generation and development of new ideas work in three primary levels within organizations and propose that certain aspects of workplaces can consistently have positive or negative effects on individuals' creativity.

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[1] Johnson, Steven. (2010 min 6:46). TED Talk - *Where Good Ideas Come From: The Natural History of Innovation.* [Video] Accessed February 13, 2014.

[2] The design of physical environment has been proved important and determining to stimulate the five senses, as well as the presence of physical icons and toys (Leonard-Barton and Swap, 1999*).*

The design of workspace and the distances within it also affects creative patterns and interactions according to Penn, Desyllas, and Vaughan (1999). Since the pace of today's organizational change is faster than it used to be, spaces are required to have an active role in helping create new organizational structures and make individual communication easier.

The configuration of the entire space system in which people move throughout their workday has detectable "useful" effects too, but it is necessary to go further than spatial integration (Penn, Desyllas, and Vaughan, 1999). Even though there is plenty of anecdotal evidence indicating that physical environment can have a positive influence in creativity, there has been little empirical exploration of the phenomenon.

Fixson, Seidel, and Bailey (2015) argue that activities that take place in a design space with the appropriate physical conditions increase the possibilities of innovation. Therefore, for Moultrie, Nilsson, Dissel, and Haner (2007), to "support creative activities the physical environment must reflect and allow an organizational atmosphere that supports creativity" (p. 59).

2.2.3. Space locations are critical to integrating the right people with the right tools[3]

Space-related with geographic location as a particular factor for innovation has been discussed by Toker U (2004), Porter and Stern (2001) and Cohendet, Grandadam and Simon. (2010) among others.

Already in the previous decades, Nelson (1993) considered that the smooth operation of innovation systems depended on "the fluidity of knowledge flows – among enterprises, universities and research institutions" (p.3), and the movement and integration of people

[3] "Innovation has become the defining challenge for global competitiveness. To manage it well, companies must harness the power of location in creating and commercializing new ideas" (Porter and Stern, 2001, p. 28).

and knowledge was key in these spaces.

Porter & Stern (2001) argue that "Innovation has become the defining challenge of global competitiveness and to manage it well, companies must harness the power of location to create and market new ideas."

Integrating the right people with the right tools means that the selection of spaces for research and development (I+D), and the management of the relationship between space and external organizations must be driven by investments in I+D and must preferably flow toward the spaces that are the most fertile for innovation.

Also, the concentration and relation of innovation through proximity was analyzed by Simmie (2005). He proposes a spatial theory in which societies, organizations, and institutions located in concentrated areas within cities-regions could generate much more innovation that in broader areas because these locations offer superior chances of innovation over other types of areas.

He argues that that is why in the United States, technological advances and the geographic location helped to encourage the creation of innovation spots to be designated as scientific parks or research parks, which were considered a new industrial geography.

Since the 1950s that situation has allowed collaboration between universities, private promoters, and the government to create groups of laboratories and companies, to increase the commercialization of research and to attract scientists to the industry and business-oriented academia (Katz and Wagner, 2014).

Thus, new industrial geography was created and it was their headquarters location and R&D activities that strongly influenced the location of innovation (Simmie, 2005).

2.2.4. Space is a valuable asset for innovation [4]

From the innovation perspective, it is evident that space can contribute to the productivity and efficiency of groups. Also, the design of the environment allows for the development of unique abilities, as well the reconfiguration of skills for the changing demands of support and synergy between complementary activities, according to Moultrie, Nilsson, Dissel, and Haner (2007).

They argue that various innovation environments have been created explicitly to promote efficient creative processes by providing design-based spaces in the different stages of the creative process. Such facilities may include spaces dedicated to exploring different ambiances enabling reflection and evaluation.

For Kelley and Littman (2006), companies that are 100% devoted to innovation, such as IDEO, assert that the way their environment and infrastructure is designed increases their creativity and performance of innovation.

Others like Peschl and Fundneider (2012, p. 47) assert that "innovation is not just a cognitive activity that takes place in the brain, it also intrinsically adjusts to the environment. It depends, to a great extent, on the immersion and interaction with the environment".

However, for the sake of this research, it is relevant to restate the difference between the design of innovative spaces and the design of SFIs.

For example, in the innovative space of the Guggenheim Museum Bilbao, Frank Gehry's architects and engineers had to face a series of challenges that went from the solution of the exterior's overlays and facades to the invention of a material to avoid water filtration, in

[4] According to Moultrie, Nilsson, Dissel, and Haner (2007), spaces in which creative and innovative activities take place are an important part of the innovation process in an organization.

order to meet the design expectations.

Since all of this had to be done, thanks to the architectural complexity of the project innovation was present in every detail, even in the design of new software as part of the process according to Chusid (2015).

Just like several architects such as Ghery have participated in the construction of innovative spaces and have created distinctive and unique places, the construction and implementation of challenging architectural projects force the project's team to create solutions that have not previously been considered. This does not necessarily imply that they have considered factors in the design of the space to promote its inhabitant's innovation skills.

Thus, it is important to highlight that the proper design of innovative spaces does not necessarily encourage innovation and the development of SFIs.

Then as claimed by Moultrie, Nilsson, Dissel, and Haner (2007) space can evolve, contributing to the creation of an innovative environment appropriate to the firm's unique context.

2.3. How can we drive innovation through the design of the environment?

2.3.1. By applying design thinking.

Paraphrasing Steve Jobs, "most people make the mistake of thinking design is what it looks like…Design is how it works" (Walker 2003), and this could be a way to define the concept of design thinking.

Seidel and Fixson (2013) have approached the term design thinking and explaining design methods for novice multidisciplinary teams, in FabLabs by Troxler and Wolf (2010), social

innovation by CSI (2010), multidisciplinary work by Seidel and Fixson (2013), enabling spaces by Peschl and Fundneider (2012), spaces dedicated to innovation by Schaeffer (2014) and even in the development of business models by Hawryszkiewycz (2014) and business schools by Fixson, Seidel, and Bailey (2015).

Stanford University has led this process since the 60s. Through its design thinking methodologies and its proposals and configurations for innovation leading spaces, it has influenced professors, authors, academics, and industry members with their innovative proposals.

Among their most distinguished promoters, T. Brown (2008) states that design thinking can be seen as the application of design methods in multidisciplinary teams and a broad range of innovation challenges.

This is relevant because it is considered by a wide range of designers and architects, as well as some business schools such as Stanford, as an approach to innovation from the perspective of design and business.

In design thinking, three important stages may be considered:

1. Need finding activities: defining a problem or opportunity through observation.

2. Brainstorming/concept development: Applying techniques that promote the pursuit of new solutions through individual ideation.

3. Prototyping and model making to facilitate the development and selection of concepts: This is the process in which new ideas are developed into a preliminary model, which allow a certain perspective to evolve, as well as the ideation potential according to Seidel and Fixson (2013).

2.3.2. By developing appropriate spaces [5]

This work is based on space and its relation to innovation; Therefore, proposing an appropriate environmental design is part of the approach seeks.

When we talk about the environment, we do not only consider the physical environment. For Fixson, Seidel, and Bailey (2015) we also need to consider the organizational, occupational, and every external factor that in one way or another may affect individuals in achieving our goals.

Therefore, executives can encourage a project's success when they make sure it is executed in an appropriate environment where everyone involved is investing their efforts, and they make it crucial for the growth and future profitability of the company (Christensen, 2013).

Companies like Steelcase (2015) have conducted extensive studies to demonstrate the importance of creating appropriate environments to stimulate innovation. They have argued that the right kinds of spaces can help people to collaborate, share knowledge, learn together, and build social networks and trustful interactions that are critical for solving difficult challenges.

For this reason, today it is important to adopt a more modern and flexible innovation process based on the environment and a business model design (Chesbrough, 2006), in an environment that is conducive to the generation of new knowledge and innovation.

2.3.3. By enabling the exchange of ideas between individuals [6]

[5] Space matters as a part of the environment, for it is in it that people work matters for their efficiency and their efficiency and effectiveness and thus can improve the way in which they communicate and coordinate their efforts (Allen and Henn, 2007)

[6] Ridley, Matt. (2010 July 22). "*When ideas have sex." TEDGlobal 2010. Ted Talks*. [Video] Accessed March 14, (2014).

The exchange of ideas has been quite sustained by different authors about effective ways to promote innovation, for example, Von Hippel (2007) argues that the informal exchange of know-how can be a resource for research advances when looking for innovative products, projects or an alternative way to cooperate.

Innovation is prompted by the contact between individuals, cultures, and people. They are nodes in a network, like neurons in the brain, they exchange ideas, find each other and interconnect causing and promoting an incremental technological progress according to Ridley[7].

When it comes to this, design thinking and ideas exchange-related activities have great potential. But they are also in danger of turning into a collection of managing fads if they are not implemented right according to Seidel and Fixson (2013).

For Capdevila (2013), innovation usually is not the result of a single individual, instead, it is the co-creation within communities and according to Ridley[8], If we get rid of the idea exchange between people, we do not just delay the innovation process; we can almost make it reversible.

Today's technologies broadly stimulate exchange. In a TED talk, Ridley[9] said, "Through the cloud, through crowdsourcing, through the bottom-up world that we've created, where not just the elites but everybody is able to have their ideas and make them meet and mate; we are surely accelerating the rate of innovation," But Internet communication has not replaced face to face Meeting Models and for Toker and Gray (2008), face-

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[7] Ridley, Matt. (2010 July 22). *"When ideas have sex." TEDGlobal 2010. Ted Talks*. [Video] Accessed March 14, (2014)..

[8] Ibid. p17.

[9] Op. cit.

to-face meetings are still considered as the most valuable sources of information.

That is why physical space plays a determining role in idea exchanges and favors the appropriation of the meeting and enrichment between individuals, therefore promoting innovation.

2.3.4. By turning creativity into business profitability [10]

Sustained growth can only happen with a continual introduction of real goods, radical services, and technological innovations to disrupt the markets and generate a new industry.

This phrase seems vain, but it is here where innovation makes a difference from creativity and, according to Auerswald and Branscomb (2003) is where we must develop the ability to convert science based in inventions into feasible commercial innovations.

I believe it is critical that we understand that in innovation there must exist two clearly defined stages that must be equal in correspondence and execution.

On one side, it must pass from the invention itself to the implementation and execution, which includes planning, financing, and promotion. Organizations that finance research require documents for their budget projects and not only "egresses" (measured in terms of the publications, patents, and training), but also results in their widest impacts in economic and social terms.

Also, the concept of the "Darwinian Seas" presented by Auerswald and Branscomb (2003) is an excellent illustration of the challenges innovators may face. Initially, innovators

[10] "Understanding the mechanism by which value will not only be created, but captured, is a necessary component of the business system that allows an invention to become a successful commercial innovation" (Auerswald and Branscomb, 2003, p. 230).

put their own satisfaction above the innovation being a significant scientific or technical advance. Then, the innovator determines what could be the base for a possible commercial product.

For this reason, they say that on one shore of the "Darwinian Sea" we find the technician and on the other, the investor or manager, but without trust between them, the "Sea" between the invention and innovation becomes deeper.

In other words, on one shore you may find the discoverer or creative—wrongly considered the innovator—and on the other shore the one with "Delivery" aptitudes (Dyer, Gregersen, and Christensen, 2013) and this separation will not generate an efficient innovation and will delay the process.

Finally, the financing sources are key to approve the creation of an idea and the initial demonstration that it works, and to transform the concept into a prototype ready for the market and supported by investors, or "Angels."

But the most important element is having an enabling infrastructure, which tends to be an obstacle that innovators face when developing their projects and ideas.

That is why turning creativity into innovation is the principle that must rule over any project that contemplates environmental design as a way to significantly improve the rates of creation.

2.3.5. By appealing to venture capital funds [11]

[11] Venture capital is defined as the funds contributed by full-time professional companies that intervene in start-ups with potential to become important businesses (OECD, 1996).

In 1996, the OECD published a document comparing industries with venture capital in most member countries of the organization. In said documents, a thorough analysis of their management was conducted.

The document highlights the importance of promoting venture capital to achieve innovation; it argues that it is very hard for big enterprises to carry out large-scale innovative projects without logistic, economic, and even political implications.

Several scholars state the importance of accelerating the innovation process through financing from angel funds and capital investors. Niosi (2003) and Auerswald and Branscomb (2003) plea that, in some cases, because of technical and market uncertainties, a decade is needed to turn an invention into innovation. That is why venture capitalists, angel investors, and bankers would rather wait to find an actual running business.

Evaluate the success or failure of an innovation on the market is a process that can take years and sometimes decades and according to (Niosi, 2003, p. 744), "Ten years seems to be the minimum period required to move ideas from the laboratory to the market", and 16 is the median after foundation in the field of biotechnology"

In innovation-oriented space, the possibility of the exchange between these two parties must be considered and appreciated. Otherwise, we will travel to the "Darwinian Sea[12]" and leave behind half of the innovation process.

Angel investors are primarily needed in the phase between invention and innovation so that individual funds can help convert ideas into innovations. But not only do venture capital companies turn into critical financial intermediaries that support the process, they also become the source of business and members in charge of delivering results.

[12] Auerswald and Branscomb (2003)

In this Thesis, I call them the "Delivery" ones, and they also must integrate into the same objective of guaranteeing innovation because if we do not promote all involved parties from the impetus of an idea all the way to market release, it will most likely result in a fight between teams, persons, or members with innovative attitudes[13].

When individuals in innovation teams with vision and creativity formulate risky ideas and are not joined in the process by those in charge of the delivery, in will be difficult to turn ideas into reality.

Because of this, projects have a higher chance of success if done in small, technology-based businesses where venture capitalists are willing to invest in innovative projects through different financial instruments (OECD, 1996).

Beyond this, the relevant role of "angels" consists of providing venture capital and professional support networks to small businesses.

In Canada, investment shares for technology have consistently grown since 1994. It is argued that companies backed by venture capital contributed to economic growth shared responsibility with the government, which plays a determining role in providing capital to individual investors through public agencies or indirectly through tax incentives.

It has been proved that good ideas are not necessarily the ones that succeed in the market. For example, Dvorak users state that moving fingers less increases typing speed and reduces mistakes when compared with the standard QWERTY, (Ford and Poe 1992) which was created for typing machines. But QWERTY is the most common one in the market nowadays.

[13] Dyer, Gregersen and Christensen (2013) Denominate them that way, referring to those people in innovation teams that have visionary, creative qualities, who are the ones to usually formulate risky proposals.

Also, even substantial investments in advertising, marketing, or research do not necessarily guarantee success for innovation for example on April 23, 1985, Coca-Cola tried to modify the drink's flavor, investing millions in advertising. However, the American people's reaction was so adverse toward the new "cola" that it forced the company to return to the original flavor. The reaction demonstrated a marketing calculation fail without precedent. (Oliver 2013)

However, how often do we bump into the question: How to evaluate the transition between an idea and a project that is viable and successful in the market? One of the answers consists in definable and actively integrating the methodological possibility within the process of prototyping ideas that in any way involve funds or venture capital projects.

2.3.6. By knowing the market and the innovation sources [14]

As stated by Von Hippel (2007), that is why different types of users are simultaneously the ones in charge of innovation. Often, these users (Final, makers, and/or providers) turn into being main innovators and product developers.

For this, it is essential to determine, categorize, and prioritize "innovators" based on their different types and categories as leading users.[15]

Since traditional marketing research methods are often ineffective when looking for innovation opportunities, Von Hippel suggests going to lead users, because they are those who are in the market's forefront, regarding how it will evolve in the future. Therefore, it

[14] Sources of innovation can be varied. In some fields, innovation users develop most innovations. In others, suppliers of innovation-related components and materials are the typical sources of innovation Von Hippel (2007).

[15] "Leading users are those who are in the market's forefront regarding how it will evolve in the future. Therefore, it is them who truly have a possibility to identify important trends… Leading users are the true source of innovation" Von Hippel (2007).

is they who truly have a possibility to identify important trends.

Womack and Jones (2003) suggest that companies should define the "value" (the product that bests fulfill the user's needs), and that the executives are responsible for clarifying the "value chain" and the measures needed to solve their product issues.

They also indicate the importance of having the user in the center of everything we do and the need to create value through reducing waste. Also, they encourage to focus on what makes sense and get rid of activities that show no potentiality.

Once again, the "lean" processes and ways of thinking highlight the importance of identifying the users' way of thinking, analyzing the value chain of the procedures, reduce waste; while still being flexible on every procedure, thus securing the organization's culture.

On the other hand, Chesbrough (2006) insists that innovation resources and market knowledge come when we exploit technological advantages. The closed innovation model that promotes the "if you want something well done, you must do it yourself" way of thinking should be rejected and moved to an opens innovation model where the distribution and exchange of knowledge contribute to the company's growth.

We may then conclude that it is important to understand the need to identify "Premium" users, who look for "lean" effective processes and to choose open innovation models as efficient ways that improve our way to innovate.

CHAPTER III

SPACE, INNOVATION AND RESEARCH

3.1. What do we mean by physical space?[16]

For the practical purpose of this research, I will use Peschl and Fundneider's (2012) definition, which indicates that "Space is understood as a container providing a set of constraints which is responsible for holding this container together as well as giving it a minimal structure and dynamics" (p. 47).

Regarding a variety of morphological and functional characteristics, I will use the guides and definitions dictated by The National Institute of Construction where a non-governmental organization without lucrative ends whose mission is to serve the public interest by supporting advances in the construction of science and technology, It has the purpose of improving buildings' performance, promoting waste reduction and conservation of energy and other resources (NIBS, 2016).

There are also a great number of spaces, categories, and subcategories that vary in name, context, and identity. It would be nearly impossible to cover them all.

Even if I did, the objective of this research is not to address them all, but only those more relevant, recurrent, and characteristic to inspire, promote, and develop the activities that foster innovation.

[16] "Done right the workspace can both inspire and facilitate innovation" (Steelcase, 2015, p. 3).

3.2. Why is innovation important? [17]

For Keeley, Walters, Pikkel, and Quinn (2013), comprehending and implementing innovation is not optional because the connectivity in which we live accelerates the change cycles and erases boundaries between markets, governments and industries.

Now to stay relevant and vibrant, all companies must innovate. That is why knowing every possible way to innovate will have a critical role in the economic progress of regions.

For Schumpeter (1939) innovation is the fundamental dimension of economic change to the business activities and the power of the market.

Schumpeter believed that innovation through or on behalf of market demand could yield better results than a simple intervention on "the price competition."

Therefore, economic growth driven by innovation through process dynamics allowed new technologies to substitute older ones in a process he called "creative destruction."

Moreover, the OECD (1996) pursues "the economic improvements" in member countries, and is driven to a great extent by the industry. As such, it is not uncommon for the OECD to try to improve companies' efficiency through a "competitive edge" with innovation or to seek to at least maintain competitiveness.

To do this, the OECD looks for variations on the demand curve for products through improvements in quality of the product, new offers from the product, or the rise of new markets through innovation.

[17] "Nowadays it is widely accepted that innovation is central to the growth of output and productivity. However, while our understanding of innovation activities and their economic impact has greatly increased since the first edition of the Manual, it is still deficient" (OECD, 2005, p. 11).

This approach is so evident that numerous scholars have expressed, justified, and emphasized the importance of innovating from the points of view of the business, product, education, and process (Autio, Kenney, Mustar, Siegel, and Wright, 2014; Björk and Magnusson, 2009; Chesbrough, 2006; Christensen, 2013; Dyer, Gregersen, and Christensen, 2013; Fagerberg, 2004; Johansson, 2004; Katz and Wagner, 2014; Keeley, Walters, Pikkel, and Quinn., 2013; Rogers, 2010; Womack and Jones, 2003; Brown, 1997) and as an imperative process for economic, social, and cultural progress of nations.

3.3. What do we mean by innovation today?

Approaching a precise definition of innovation regarding the design of spaces is not something that can be taken lightly and overlooked.

First, I must make clear that the definitions of innovation are as varied as the number[18]of people who asked what the correct definition is or published papers on the topic.

For example, Wang, (2009, p. 3) defines innovation as an "idea, practice, or object that is perceived as new by an individual or other unit of development and adoption."

For Capdevila (2013), innovation is the result of social interactions that are not only unidirectional but bidirectional, in relation to this perspective, the transfer of knowledge is not unidirectional from producers to users but bidirectional. Therefore, innovation is a result of this social interaction.

[18] Different opinions about innovation: In different video interviews I recorded for this research on 2014, Naomi Berlin defines innovation as follows : "Innovation means making changes of anything that already exist but making it better", for Lam Yui Yim " innovation is something that can make our life be more interesting if more fun and have a better life", and also for Ferchowa " it's any product, service, business model, or anything that changes the human behavior and the user takes as a better option than the one it was used to".

In her interviews with different innovators and people working in innovation teams Schaeffer (2014) found that some defined it in a more organized, "clean" way as "a new way of thinking," "creating a new future related to a workplace to promote innovation" Others described that space as, airy, illuminated, clean, ordered and in good condition.

Conforming to them, in "IDEO's innovation offices, the answer to the question: What is innovation for you? Ranged from a 5-minute reply to a 20-minute argument." Some talked of innovation at work as a way of being able to change the world, while others reported that the word innovation did not mean anything to them (p. 28) for it is the design process itself is an innovative view; giving place to an innovative product or service.

Some other views were directed towards the comprehension of the notion of innovation as exploring and design as a source of inspiration (Schaeffer, 2014,).

Others, such as Peschl and Fundneider (2012) define "innovation processes as reciprocal processes to the interaction between different elements and activities (for example: observing, listening, communicating investigating, the creation of new knowledge, etc.) performed with a different attitude; with specific objectives and domains (or interested parties)." (p. 43).

Also, the OECD (2005) divides innovation into four areas: products, processes, commercialization, and organization. It also defines innovation as: "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations" (p. 47).

For Rogers (2010) "Innovation is an idea, practice, or object that is perceived as new by an individual unit or another adopting unit" (p. 11). Newness is more defined in terms of time or when something is released on the market for the first time; He argues that "the newness of the idea perceived by the individual determines its reaction. If the idea seems new to the

individual, it is an innovation" (p. 11).

The concept of innovation that has been commonly adopted is more like the perception of something new instead of addressing its impacts at the moment of the market implementation.

Therefore, Rogers (2010) points out that the novelty of an innovation should not only rely on new knowledge. Instead, the appearance of the novelty of an innovation can be expressed in terms of knowledge, persuasion, or the adoption decision.

Fagerberg (2004) suggests that it is important to distinguish between invention and innovation. Invention is the first occurrence of an idea for a new product or process, whereas innovation is the first marketing of this idea. Sometimes it is difficult to distinguish between invention and innovation because they are closely related, for example, in biotechnology.

Even though we could agree with Fagerberg that many inventions require additional innovations to succeed, his definition leaves companies not necessarily considered "industries" or inventors that do not believe they sold their ideas out of the innovation landscape.

Christensen (2013) says that most managers inquire on innovation regarding sustainable technology and that innovations are "targeted at known markets in which customer needs are understood" (p. 117).

Different authors have approached the relationship between innovation in the market and its success, but perhaps a more recent work could shed light on the state of innovation definitions and their impact.

Baregheh, Rowley, and Sambrook (2009) evaluated, organized, and categorized the various

definitions of innovation that had been proposed by the most significant authors at the time. They identified 60 different definitions that range across the fields of economy, innovation, entrepreneurship, science and technology, as well as engineering and commercialization.

In their study, regarding the definition of innovation, Baregheh, Rowley, and Sambrook (2009) state that, "scholars have paid more attention to type, means, social context and stages of innovation and have made relatively limited reference to the aim of innovation" (p. 11). They suggest an obvious disconnect between the rhetoric of innovation and the strategic context.

Moreover, they sustain that "most research reports and articles on innovation start by explaining the strategic importance of innovation" (p. 11). However, they could be wrong and this may be due to the "Negligence in the definitions" in which everybody assumes that innovation is something we understand when we talk about it.

Baregheh, Rowley, and Sambrook (2009) imply that it may be appropriate for each discipline to seek its own definition, but they also write: "However, as business and research become more inter- and multi-disciplinary, they suggest there is a need for a more generic, integrative definition" (p. 12) of the term innovation.

Also, Mitleton-Kelly (2006) states that innovation needs to be distinguished from creativity. The former is when a new idea is put into practice whereas creativity is the thinking up of the new idea. Innovation cannot happen without the creative idea, but the latter can occur in the absence of the former.

Since the current number and diversity of definitions of innovation create ambiguity and confusion, for the purposes of this study, I am going to assume the definition of innovation by recognizing that while creativity and invention are responsible for generating value, innovation is the art of capturing the added value that has been generated. In other words, innovation is what makes an idea profitable!

3.4. How to measure innovation?

To break down the ways of making an idea profitable, and after reviewing the OECD (2005) and the thoughts of some of the most significant authors of our time including Smith (2005), who studied how to measure innovation through Community Innovation Survey (CIS), I could say that value can be measured through four main aspects:

3.4.1. Capturing knowledge

All facts, information, and skills acquired by a person or entity through experience or education and the sum of what they know is understood as knowledge, and by measuring their know-how, we can demonstrate the value of an innovation.

In this category, universities, research centers, laboratories, companies, persons and different institutions can be measured in conventional ways, such as the number of scientific documents, patents, indexed articles, among others.

3.4.2. Capturing recognition

Innovation is also knowing how to be marketed and to make our idea recognizable in the market.

It used to seem impossible to measure recognition, except by conducting a market study. However, over time and through interconnections, we have gained access to an uncountable number of tools that allow us to measure the influence level of a person, idea, or product in a defined context.

Recognition can be measured by the number of “likes” on a social network page or the

number of followers in another one; all these are indicators that allow us to know the level of recognition of a person, product, company or even a cause.

In the recognition of value, we can understand that sometimes we evaluate fame and sometimes prestige. The difference between them is that fame is recognized by everyone, while prestige is recognized only by those how are actually interested in the item.

Recognition can also be measured through the amount and relevance of local or international prizes, certificates, and distinctions such as the Nobel Prize, the Pulitzer, and the Oscar, etc.

3.4.3. Capturing social benefit

If innovation helps us economically, it also has a profound impact on the social conscience and all the actions that allow us to face future challenges.

Social value is understood as the number of people who can benefit by the development of an innovation, including the well-being of people and communities, social capital and the environment.

In a more general way we can understand it as all the elements that allow us to quantify the welfare of citizens.

The challenges of today's innovations are not just capturing economic value, knowledge or recognition, but it is also imperative that we manage conscious politics in order to benefit human beings and their environment.

The social value must be understood not only as a small percentage of the equation, but also a decided and majority-vote scenario that allows us to understand that any innovation factor

today must include the environment as a variable.

Lastly, it is worth noting the OECD document "Measuring Innovation a New Perspective 2010," which takes a wider and horizontal view to understand the nature of innovation and its impact, thus helping to supervise the functioning of the world's innovation systems. In the document, there are perspectives referring to the need to move a step further from the numbers by incorporating new indicators.

3.4.4. Capturing economic value

Finally, most studies talk about the capture of economic value as something measurable, quantifiable, and fully taxable in most cases. After all, in a capitalist economy where every party bases the success of their strategies in their wealth and its growth, the economic value is still fundamental.

In this scenario, the tools to measure the economic value of an innovation can be found in stock-market indicators, the value of shares, financial statements, and many others that allow us to measure, plan, and predict its future impact on the market.

At the end, it is the sum of all these factors that determines the degree to which an institution or person is more innovative than another.

For example, for many years, Apple was considered a reputable company for capturing recognition and fame. It had the knowledge and the know-how, but out of its competitors, it was not the best company when it came to capturing economic profitability.

Apple created the Newton and then Palm Pilot improved it, gaining the real sales success (Honan 2013). It was also Apple that set the basis for an interface with Windows, but it was Microsoft that exploited the idea and made it into a profitable, favorite product, which

expanded their superiority. (Rizzo 2009)

However, apple becomes genuinely innovative when they decided to change its strategy, and turned to creating applications that worked on every computer and developed highly compatible products, such as the iPod, iTunes, iPad, etc., it became the center of the innovation. It was until then that it became, not only recognized, appreciated, and the most knowledgeable, but also the most profitable.

Today Apple faces the challenge of staying ahead of innovation-leading social policies, making it not only the one with the most recognized products, the one that handles exclusive patents, and has the biggest incomes, but also the one that respects and preserves the environment (Johnson, Yang, Hang, Singer, and Hoang .2012) to finally capture the most important value in the market, the social one.

3.5. Research method

3.5.1. Research in environmental design

In applied research for environmental design, Forsyth and Crewe (2006) have made it clear that there are different ways to approach the subject, and consider “synthesis” work an important result of environmental design research.

Understanding a “synthesis” in gathering an important argument from a series of existing works, where the “synthesis” is more than the sum of all its parts. This research summarizes, analyzes, and classifies the different results of previous ones in order to create a new conceptualization.

After sifting and classifying previous research, I propose to reconfigure some of its parts. Since sources for “synthesis” works are often scattered, I tried to determine a logical order

for this work. I synthesized the different authors' approaches that were previously fragmented, dispersed, unfinished, and even dissociated into different categories.

My approach included, first: The analysis of every global aspect—macro or concerning the different parties that intervene in environmental design—related to innovation that has been widely referenced by different authors.

I identified places and classified them based on their (measurable) spatial scale.

Then, throughout the reading and analysis, I zoomed into spaces and micro-contexts that refer to SFI design from a physical point of view (regarding real tangible spaces and each of its elements).

In this way, I intend for my contribution not just to summarize and classify these spaces, but also to contribute to research and development of new SFIs.

This research focuses on real, physical, and tangible spaces where innovation is promoted consciously or semi-consciously, from different places—particularly within work organizations or spaces that support academic, corporate, public and private work, as well as logical environments for physical interaction.

3.5.2. Research strategy

Regarding the information gathering and the literature review, I put together a broad range of sources based on data from Scopus, Academic Google, Proquest, Virtuose, and the library system at UQAM University, in conjunction with online research.

I searched for keywords such as: "foster innovation," "the space for innovation," "space and innovation," "environments for innovation," "innovation and space," and "architecture

and innovation."

I also searched online data banks such as ArchDaily, relevant research publications, and specialized magazines and books on the subject.

In a second stage, I visited different physical places related to innovation in a global scale such as Boston, Montreal, Toronto, Hong Kong, Puebla, Monterrey, Manizales, and Xiamen, among others.

I interviewed architects, designers, space inhabitants, people in charge of the spaces' management and their administration. I took pictures and filmed videos that allowed me to better understand the relationships between these people and the innovation context, as well as its different uses.

I also used my job as the director of innovation at CD&I Associates to apply, learn and unlearn, several processes and models that have been used for years to design innovative projects and SFI. This approach was critical because it allowed me to find strengths and shortcomings, as well as opportunities in each space, by applying them to ongoing projects of the company.

In the end, my work consisted of organizing all this information through a system of mental maps supported by the "Docear" software. Finally, I proceeded to classify all the synthesized information and disclose it in this document.

3.5.3. Steps

1. Research

   a. An extensive review of the literature: to identify the types of SFIs, the authors, the categories, and how they are projected.

   b. Interviews and site visits: to gain insight from some innovators, the people running the spaces, people involved in their creation, and the inhabitants of the ecosystem as well.

2. Classify and understand the similarities and key differences based on the principles I have identified.

3. Compare and evaluate the results of my findings.

4. Conclude what types of an innovation spaces exist?

5. Propose the “taxonomy” of the innovation ecosystem.

CHAPTER IV

SPACES FOR INNOVATION

4.1. Have they been classified before?

Back in 1999 Penn, Desyllas, and Vaughan mentioned that with few exceptions, there has been little in the way of for all research into the effects of the design of the workplace on the performance of creative or innovative organizations, a decade later, Schaeffer (2014) commented that also "little research has been done on users' experience on workplaces for innovation in a manufacturing industrial context" (p.4).

As said by Fagerberg (2004), the study of "spaces for innovation" needs to focus more on the exploration of the links and interrelationships throughout different spatial scales or levels, from local/regional to "global" (Bunnell and Coe, 2001).

Fagerberg (2004) also notes that one of innovation's surprising facts is its variability in time and space.

Moreover, these terms "system" or "network" are essential to understand innovation, so much that different research groups have studied them from different origins

4.2. The space of innovation has moved

Fagerberg (2004) states that one of the most surprising facets about innovation is its

variability in time and space.

For him, innovation has moved through time from one region to another, and its center has also moved to new regions and countries. At first, the United Kingdom was considered the world capital of innovation, as it achieved growth in productivity and income more than 50% greater than other neighbor countries halfway through the 19th century.

With the emergence of innovation centers in the 20th century, the focus of innovation later moved to Germany. However, since the middle of the 20th century, the United States has been considered as the world capital of innovation.

For Schumpeter, innovation politics are the interaction between science, technology, and industry. However, according to him, innovation has a fundamental impact on economic evolution through creating "temporal monopolies" (1939, p. 161-74). But today these monopolies have excellent benefits that are rapidly challenged by competitors and imitators, causing competition to grow and develop new products and processes.

From an environmental design perspective and in general throughout this research, I have found that many authors and researchers who have approached the research of SFIs have neglected to clarify them within their ecosystem.

4.3. What's an innovation ecosystem?

Jackson, (2011, p. 2) defines an innovation ecosystem as the one that "models the economic rather than the energy dynamics of the complex relationships that are formed between actors or entities whose functional goal is to enable technology development and innovation".

In this context, she observes that these actors/agents are divided into material resources (funds, equipment, spaces, facilities, etc.) and human capital (professors, students, staff

members, researchers, etc.). At the same time, these agents constitute institutional entities that participate in the ecosystem (universities, business schools, companies, venture capital funds, engineering schools, research institutes, excellence centers, and state and or/local organizations for economic development and business assistance, funding agencies, political actors, etc.).

The ecosystem, in turn, approaches two different but complementary economies. These economies are the research economy, driven by research, and the commercial economy, which is market driven.

They work in an integrated manner, generating an ecosystem in which resources invested in the research economy come from the results of the commercial economy.

It may also be considered as one in which innovation networks, communities, and organizations interact to produce and use innovations (Wang, 2009).

It has been considered that members of this environment can be classified as:

a. Producers: who are mainly dedicated to basic and applied research, manufacturing, and the development of new products for the market. This market's main actors or agents are the government, investors, universities, vendors, companies, capitals, laboratories, and regulating designers.

b. Served communities or consumers: are first to adopt innovations and follow a cycle of initially understanding it, subsequently adopting and then implementing it, and finally abandoning or disposing of them.

Users can be considered as the organization, the media, universities, researchers, consultants, and the public in general.

As reported by Wang (2009), all of this is regulated by supply and demand, determining the equilibrium between production and where a member can participate in each activity.

These activities may include developing or adopting innovations or migrating from one category to the other, or from one innovation community to the other.

In these innovation ecosystems, innovation networks are considered to be the interrelation between innovations, their relationships, and the different ways the innovation set is produced.

For the purpose of this research, I will understand the innovation ecosystem as the involved organizations, people and resources, and the relationships between them in order to orchestrate activities, results, and innovation-relative uses. In them, different kinds of innovations are used and produced.

4.4. What is the profile of the innovators who work within these spaces?

For Von Hippel (2007), there are different kinds of users that in a way are also the ones in charge of developing, to some extent, innovation and these users often become the primary innovators and product developers.

Dyer, Gregersen, and Christensen (2013) brought forward a study with four kinds of entrepreneurial innovators:

- Start-ups
- Corporate entrepreneurs (those who release an innovative company within the corporation)
- Product innovators (those who invent a new product)
- Process innovators (those who start a ‘breakthrough process’)

After studying 5,000 executives and innovators, they found that they all share some characteristics. I will reclassify them as:

4.4.1. The deliverers

They describe themselves as the executors. One of their main characteristics is that they have the ability to work 'inside the box.' They are excellent at turning a vision or a goal into results, and set specific tasks to achieve a specific objective.

Also, they are good at organizing tasks and therefore they can execute logical, detailed, and some data-based plans. They have advanced analytical and planning abilities, are attentive to detail, and have disciplined execution skills.

In this group, we can find most companies' CEOs who show proven abilities to deliver results. They are professional administrators. They are better equipped to climb within companies and often end up replacing the "creative" founders, who are better known for their abilities to discover.

Steve Wozniak, who was the real executioner of Apple in 1976, is someone who could be counted in this group. Without Wozniak's executing talents, it would have been impossible to now know Apple's complete history.

4.4.2. The creative

This group is described by Dyer, Gregersen, and Christensen (2013) as the ones with "discovery skills." In this group, we can find some of the most recognized innovators, because they are the ones known for generating "crazier" ideas, proposing new business ideas, having a bit of an irrational instinct, and showing overconfidence. They will

more often make decisions based on hunches or instinct.

While studying them, they found that individuals with this profile were at the top of the most innovative companies (which are a tiny percentage) and their main features were:

a. Integrate: they integrate ideas with ideas, therefore establishing new associations that in turn result in new ideas.

b. Discover: they know the right questions to ask and effectively ask: "Why?" "Why not?" And "what if?"

c. Observe: they scrutinize their potential client's behavior.

d. Experiment: they actively look for new ideas through prototyping. They have great networking capabilities, for creating networks and interconnections with others as mentioned by Johansson (2004).

Under this profile, we can find people like Steve Jobs. With his vision, he managed to push the result, promote it, and make it visible. He gave the company the direction and inspiration that made it the first in the world.

In conclusion, we can understand the profile of an innovator—or an innovation team—as divided into two: the ones with abilities to discover or "creative," and those who have more abilities to deliver or "delivery."

Innovation will not exist without having both parts in the same process. In other words, without the ability to envision together with the ability to deliver, it is hard for innovation to happen.

4.5. What is their vocation?

In the previous chapters, I have widely justified why collaborative innovation will undeniably be the main pillar in the development of innovative projects in the future.

Today, it is almost impossible to talk about innovation without collaboration. Therefore, it is essential for any approach addressing the context and analysis of SFIs to be done from a collective and collaborative point of view rather than an individual perspective.

About this, Capdevila (2013) proposes different levels within physical spaces where innovation is produced, specifically in those communities of innovation that can be located in, but do not belong to, a properly defined organization.

He called these spaces "LSCI," or located spaces for collaborative innovation, as the physical places where knowledge communities come together to innovate in a collective way (Capdevila, 2013). Focusing his research, the layer of innovation described as middle ground by Cohendet, Grandadam, and Simon (2010).

Capdevila's argument is very appropriate to mention when classifying these spaces. The same classification that he presented can be used to some extent with closed spaces or where the process takes place within specific organizations. However, the spaces of collaborative innovation are also part of closed organizations.

Even though Capdevila studied spaces of collaborative innovation, his research only contemplates public open spaces to encourage collective creativity where there are innovation communities. Comprehensive research on spaces of innovation has not yet been conducted, which makes it critical to investigate.

Again, one must keep in mind that since spaces are mainly collaborative, the work and identification aspect of said spaces is crucial for their classification and the identification of their typologies.

4.6. How to sort and evaluate the space for innovation?

After conducting an in-depth review of the literature, six approaches for classifying SFIs stand out: the epistemological, the individual's perspective, the territorial scale, the city complexity, the workplace's role and how people work.

Each stance approaches it differently, but in a way, that is pertinent for their holistic understanding or point of view.

Therefore, if we wish to truly comprehend the spaces' dynamic within an ecosystem of innovation, we must consider some of these approaches proposed by different authors who have, addressed this aspect:

4.6.1. From the epistemological point of view [19]

Peschl and Fundneider consider that the cognitive approach to innovation is important within the work of spaces, and they argue that "Any kind of innovation activity—at its very core—is based on epistemological and cognitive processes". because "They are the foundation for economic dynamics, for social processes and interactions, for organizational processes and structures" (2012, p. 43)

For them, said spaces can be classified as those that lead to new insights in which innovation can take place in a "qualitative" manner, thus allowing "things" as an alternative to management or control.

These "enabling spaces" are environments where we stimulate and nourish the interaction

[19] According to the professor for Cognitive Science and Philosophy of Science at the University of Vienna, Markus Peschl and the founder and CEO of the Living Core Thomas Fundneider

between environments and cognitive systems to facilitate the processes that generate new knowledge.

When seen from this perspective, spaces are integrated by sustaining innovation activities focused on game-changing or radical innovations and for them they can be divided in the following aspects:

a. The physical and architectural space: The houses, urban areas, and urban settlements conform the physical space, or the citizen's space, in which innovation processes and knowledge take place in a tangible way.

   It is a physical environment intentionally designed and built that surrounds the users with its structure. This structure includes the space and its context and can mainly be defined by two elements: the architecture (as built structures) and the design, or in other words, the offices, or spaces for creative work and knowledge.

b. The sociocultural and organizational space: It understands social interaction as a crucial factor for any kind of innovation process and facilitates by promoting trust and openness. It must be established before the innovation work and is related to the aspects that are part of the hierarchy, departmental structures, interaction patterns, and the culture of communication, among others.

c. Cognitive space: It refers to knowledge. It originates in the individual brain and its cognitive processes. It comprehends what is related or belongs to the cloud of information available thanks to learning processes or experiences.

d. Emotional space: Even though it is related to cognitive space, it is considered independent and can be understood as the space where the elements' feelings or perceptions and its relationships with reality or imagination converge.
e. Epistemological space: It is where every process related to knowledge and actions

that promote its appropriation takes place, alongside the identification of innovation opportunities.

f. Technological and virtual space: Since innovation processes are usually integrated into a technological environment, this space comprehends a wide range of resources that include "low technology" tools, such as blackboards, flip charts, etc. to high-tech tools.

It is important to distinguish the different types of context that influence business innovation, such as industrial, technological, organizational, institutional, political, social, spatial, and temporal contexts. For Fallman (2008), these contexts are strongly interrelated and it is also important to comprehend the role that design plays in the configuration of the space and the interaction on this level.

For example, regional innovation systems can encourage innovation and the creation of new companies. This can be done thanks to public intervention and the implementation of policies that stimulate the relationships between local matters and regional universities, research institutions, major private enterprises, small and medium businesses, and the creation of new companies.

For Autio, Kenney, Mustar, Siegel, and Wright (2014), context plays a key role in the stimulation of business innovation.

4.6.2. From the individual's perspective [20]

From the individual's perspective and due to the changes in the practice of innovation, corporate culture and the way people collaborate is changing, too.

New business models are developed and within them, people are the connective network

[20] According to Elisa O'Donnell Chief Client Officer & Global Solutions Head of Imaginatik.

of the organizations. It is through their thoughts and new ideas that these business models come together and travel through the different spaces of innovation.

This connectivity of people and ideas is denominated by O'Donnell (2012) "the bump rate," which is nothing but the possibility to facilitate sporadic encounters between the individuals.

Thus, we can consider that spaces can also be classified in terms of their relation to individuals:

a. The mind space: It is related with knowledge and the ideas generated by the individuals, both in and out of the organization. It gives individuals time for themselves, to think and reflect within their own mental spaces.

b. This ecosystem, fundamentally, not only allows innovation and business success, it also helps to create high commitment levels from employees and a culture of trust, loyalty, and collaboration.

c. The physical space: It is considered a rich and multifaceted space that includes tangible aspects related to traditional spaces in it. It covers conference rooms and workstations to informal spaces.

This kind of physical space may include hallways, cafeterias, coffee stations, etc. that are considered as "discovering" spaces."

O'Donnell (2012) also mentions that therefore, innovation's new practice must define deliberate strategies for the exploitation of the different dimensions of physical spaces. When done, it can significantly improve the ability of an organization to encourage the kind of new connections that may lead to big changes in the way everyone thinks and innovates.

The virtual space: While physical space can encourage deep commitment, and is very useful in helping people get their thoughts organized, decision-making and teamwork, O'Donnell (2012) states that it may be hard to obtain consensus from every participant and may be difficult to organize the people within the space.

This is why virtual space completes two essential tasks related to business innovation:

a. It assures connectivity to reassess points of view;

b. It allows innovation leaders to filter and select the most useful ideas to later; track them throughout the whole process of implementation.

In conclusion, whether using physical or virtual space, the new practice for innovation requires that between them, the potential for covering and using mental space is expanded. Thus, the physical space helps promote commitment, while virtual space allows knowledge obtained from the physical world to be captured and reflected on the mental space in order to turn it into something real.

4.6.3. Due to the territorial scale [21]

Bunnell and Coe define scale as "a fluid and multidimensional concept, delineating the complex interactions between physical space, institutional and regulatory jurisdictions, and the shifting levels at which the actors in innovation systems organize themselves" (2001, p. 570), but also, they argue that, "focusing attention on just one spatial scale will rarely be adequate for a full understanding of innovation processes" (2001, p. 583).

Trough they research we can consider three scales relative to physical SFIs:

[21] According to Timothy G. Bunnell from the Department of Geography, National University of Singapore, and Neil M. Coe from the School of Geography, University of Manchester

The global scale: Formed mainly by the international innovation networks and composed of much more than multinational firms. It also covers the relationships between companies and transnational companies.

The national scale: For Nelson (1993), this scale is related to the national innovation system, understood as the collection of circumstances that generate and moderate the economic growth in which technological innovation is the key force that directs them and the group of institutions that are part of a nation.

The national innovation system (also known as SNI) is the flow of information technology between people, companies, and institutions, which is critical for the process of innovation. In it, innovation and technological development are the results of a sophisticated group of relationships between the parts of the system, which includes companies, universities, and government research institutions.

The sub-national scale: It includes regions, cities and localities, in which the research on a company's role regarding an innovation system is concentrated in two categories:

a. The first category concentrates on the company as a place of innovation.

b. The second refers to the companies that are part of innovation networks. As stated by Bunnell and Coe (2001) regions, cities, localities and firms are at this level.

Even "a lot of attention must be given to the extra-local connections in innovation studies" (Bunnell and Coe, 2001, p. 583)., and for this reason and as part of this scale, I can furthermore consider the pan-regional level, which comprises those states that extend beyond their limits, seeking their regions to develop economic and political alliances by influencing a region where the state can exert its sphere of economic, political and cultural influence.

For example, the United States of America influences neighboring countries and neighboring regions, such as Canada, Mexico, and some South American states.

4.6.4. Based on city complexity as a reference point [22]

Cohendet, Grandadam and Simon (2010) describe and analyze the dynamics of creativity when addressing creative cities that simultaneously contribute to the creation of particular local ecology of innovation-related knowledge.

For them, there are different strata in society and the configuration to promote innovation acts interactively within them. They are like three differential layers, which are:

a. The Upper ground: Where formal institutions, and creative or cultural companies or institutions are. Its specific function is to bring creative ideas to the market.

   It is considered the upper layer of the creative city. It counts with innovative companies, and institutions such as research laboratories, universities, and artistic and cultural centers. Here, the results of innovation are designed and promoted by the people responsible for the companies' project (the hierarchy) in agreement with another level of micro-creativity that comes from the everyday activities of the creative communities (Cohendet, Grandadam, and Simon, 2010)

b. The Middle ground: Since underground culture is something happening at an almost invisible layer, this layer is the basic middle tier that connects the Underground world with the Upper ground.

   It is considered the most critical layer because besides being in between, it becomes a level in which the communities' work allows for interaction, creation, and

[22] According to Patrick Cohendet, David Grandadam and Laurent Simon from the HEC Montréal , Canada.

intercommunication of other common platforms, thus facilitating the transmission of knowledge and the learning that precedes innovation among all layers.

c. The Underground [23:] Constituted by the creative people, artists, and other workers of knowledge, and individuals who are not directly related to the commercial and industrial world, and are outside of corporate logic.

   It gathers the creative, artistic, and cultural activities that take place outside of any formal organization or institution. It is based on the production, exploitation, and diffusion; all individuals within it share a common interest in art and culture. These individuals are considered the primary boosting force toward new trends and leaders in the evolutionary course of art and culture.

4.6.5. Based on their role in the workplace [24]

Probably the most complete and recent study on SFIs is the one by Schaeffer (2014). In it, she formulates six special characteristics in the descriptions of workplaces related to the encouragement of innovation and explorative innovation: (SEI)

a. Undercover—Coffee room: Consists of under-covered spaces where one's culture is capable of entering another's culture. It is ruled by the norms of informal communication, aperture, and unenforced change. It has a vaguely structured organization.

[23] In this thesis, it was difficult to investigate and identify territories and spaces of innovation that exist in the underground level—those that occur informally. Therefore, this kind of space has not been considered in the classification of this study, but it is worthwhile to understand that many of them are potential agents of the spark that initiates innovations.

[24] According to Jennie Andersson Schaeffer from the School of Innovation, Design and Engineering, Mälardalen University. Sweden

b. Gray areas and spaces for "illegal" meetings: These spaces provide a certain equilibrium between standardized, controlled and safe things and those that are improvised, uncontrolled, and unsafe. Therefore, they are proposed as spaces that have a mix of contradictions within them.

c. Temporary Space: They can easily be configured, translated into different places, and created and recreated in just a few minutes. A special attitude supports Their temporality.

d. Accessing space entrances and hallways: Those that have a potential to encourage a culture of innovation, or exploration, and are usually found in the access areas.

e. Chameleon space: It is used based on its changing character. It changes and may support the innovation of exploration depending on the contextual factors.

f. Satellite space: A space outside the origin facilities, it comes as a possible space for a culture of exploratory innovation because of a weak link inside the actual facilities, their cultures, and everyday routines.

4.6.6. From how people work [25]

Steelcase's research team considers that there are two types of physical spaces to promote innovation:

1. Outer house: Where the space contains other spaces and can be composed of a bigger edification itself or by a set of buildings that at the same time constitute a district or region;

[25] According to the Applied Research + Consulting team of the largest office furniture manufacturer in the world, Steelcase.

2. Inner house: Spaces contained or hosted by an outer-house space.

They also propose a correlation between both spaces in which their relationship may be vague, in the sense that an Outer house can be an inner-house space within a big territory at the same time.

It was through the analysis of different combinations of attributes within different organizations that the researchers at Steelcase (2015) identified eight innovation models to support disruptive innovation:

a. The Marketplace model: In this highly-centralized model, an innovation culture and the concept of development are immersed at every level of the organization.

The idea of this model is to create districts where each team can collaborate and share ideas, defined by a center area that allows information to be published in different real or virtual platforms. In it we can find private areas to sustain deep discussions or brainstorming sessions without interruptions.

In this model, the cafeteria is the space to chat and it works as a limit between teams, attracting people from other areas to exchange ideas, to foster cross-pollination of ideas.

b. The Share model: It seeks for the members of several specialized groups of the team to expand and contract as needed, to take advantage of the immediate assistance between them thanks to proximity, provoking continual interactions.

Each team has a space of shared public information and private areas where they can propose ideas and work through prototypes without scrutiny or distractions from outsiders. Furthermore, in this model, individual workspaces are on the outskirts of the adjacent areas.

c. Center model: It empowers a group to be responsible for the innovation within the organization. In this model, the project's spaces are like an oasis where ideas are shared among the members. It is the prototyping area that creates the outer limit that allows trying ideas in the real, external space.

d. Offsite model: It is based on the concept of "getaway to innovate" It is a remote center where a team develops prototypes and validates the innovation leads. At the same time, the team has access to the organization's funds.

The objective consists of keeping in touch with the "mothership" through video conferences or similar methods. Having a cozy "porch" area allows the hosting team to attend to visitors, while simultaneously offering spaces for private and public meetings, laboratories, projects and prototyping spaces, as well as alternative work settings for the members of the mobile team.

e. Partnership model: It promotes short-term alliances, in which two different organizations share a space for specific times. In this model, each partner has their space, but they also share it physically.

These spaces have Touchdown and presentation areas where members can meet at specific times.

f. Consultancy model: They are the experts that bring along specific abilities and solutions to different problems and a perspective free of corporate prejudice, leaving behind the long-term education system. In this model, shared spaces allow for a sort of "guest house" that both organizations share, but also in a parallel way each one has separate areas where their individual cultures prevail.

g. The network model: This model invites people to visit and bring their ideas with them. It includes institutions, organizations, community members or professionals in a

seemingly open innovation system where anyone can participate.
In this kind of space, gathering and sharing information is allowed in a way that people take into their own team's environment fractions of it for a more significant exploration and refining.

h. The community model: It is an autonomous network that meets to give ideas and fulfill a need rapidly. It seeks perspective amplitude thanks to the free exchange and open knowledge. This model depends on technology. In this category, actual "co-working" spaces can be considered, as well as galleries for art exhibits or hackerspaces.

CHAPTER V

A PROPOSAL TO CLASSIFY THE PHYSICAL SPACES ASSOCIATED TO INNOVATION

It is important to clarify that the various and numerous types of physical spaces listed have been associated with the idea of innovation by authors and external observers, and the names attributed to these spaces are mainly credited to them.

But due to differences in opinions and approaches of the various perspectives and disciplines through which they were investigated, it became necessary for me to clarify and unify the various criteria, proposing (and in some cases, reformulating or reclassifying) the definition of some of these spaces based on the previous research and the different field visits and interviews that I carried out in the context of this research.

For this reason, I will suggest below a classification of SFIs, mainly grounded on a new mixed approach that I found more suitable, on the one hand taking into account the epistemological approach that refers to our perception of physical and architectonic space, as suggested by Peschl and Fundneider (2014), and on the other hand based on the complexity of the environments approached by Cohendet, Grandadam and Simon (2010).

My role in the classification has not only been to organize them, but also to rename or name, identify and improve the determination of their functions in relation to what should be understood as an SFI.

All this was done according to the suggested approach to the term “innovation” in this research, seeking to give a precise definition of its function and logic.

Also, the names and definitions suggested for some of them are the product of my reflection and analysis of the literature, as well as the visits, interviews, and research carried out throughout this project.

In some other cases, I have extracted accurate statements or definitions made by different authors, since I found them widely appropriate in terms of defining such spaces. In these cases, the author is duly referenced.

The classification is structured as follows to facilitate its understanding and analysis:

First, one finds the space’s name or title; underneath it, one finds a list of one or more spaces that I have identified and that are constituted as illustrative examples of the respective category.

The following information will also be indicated as it applies: the year in which this place was inaugurated, founded or constituted, the area that it occupies now, the physical space where this environment is located (occasionally stating an important reference in this respect), and the firm of architects, designers, company or institution responsible for the design of this environment.

Subsequently, the abridged definition of this space and its description, characteristics, as well as some relevant data and, in some cases, examples can be found in the related content.

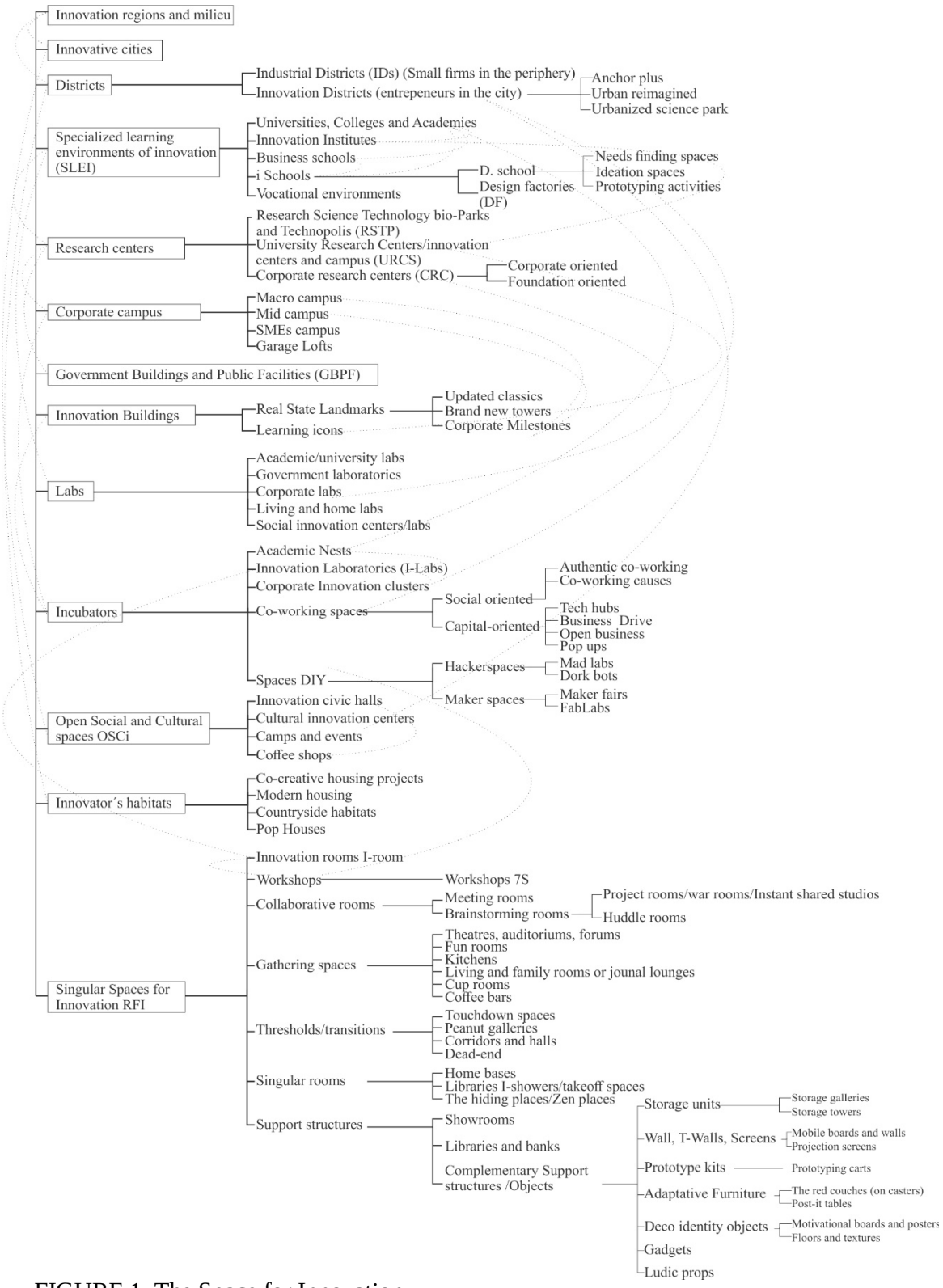

FIGURE 1. The Space for Innovation.

The chart above summarizes the classification from the most complex SFI to the simplest ones and their interconnections

Although a series of relationships can be established within the ecosystem of SFIs, in this graph I only illustrate the most robust relationships that I identified during my research.

Hence, we can consider the following spaces:

5.1. Innovation regions and milieu

1939 / 1'927,000.000 m²/Silicon Valley the epicenter of innovation in California, USA

Geographical and cultural spaces, larger than a city, but usually smaller than a nation, containing all other SFIs where innovative industries flourish.

These regions promote and are associated with Regional Innovation Systems (RIS), stimulating the fast spread of knowledge as well as abilities, and possibilities of interconnections, adjustment, and development of innovative projects or "innovative Milieu" as stated by (Camagni, 1995).

According to Aydalot (1996), these environments have a determining role in the incubation of innovation and act as a catalyst. A company is not innovative if it acts in isolation and the fact that it belongs to a specific location and a medium creates a positive reaction.

Cooke, Gomez Uranga and Etxebarria (1997) demonstrate that spatial limits do not restrict innovation regions and systems. Therefore, their jurisdiction depends on their autonomy and the cultural region that shapes them. Even if an innovation region is not typically more prominent than a state, it may include more than one.

In the European context, the OECD (1996) has attributed great importance to these spaces. It has adopted regional development models, subdivided territories in consonance with a statistic analysis, and promoted innovation blocks that sometimes transcend countries' borders.

From the epistemological point of view, Healy and Morgan (2012) denominate them as "Learning regions." They argue that the interaction generated by geographic proximity configures the learning SFIs and promotes more efficient interactions between users for the diffusion of knowledge and innovation.

Simmie (2005) indicates that the "flexible specialization" of SFIs has inspired two prominent schools of thought.

One of these schools of thought argues that innovation is framed by physical and geographic spaces where small and interconnected firms are located in what is described in line with Camagni (1995) as "the new industrial districts or innovative Milieu."

The other school of thought is related to the analysis of "networked" economies in which the creation, location, and influence of local companies exist due to a productive dynamic system inside an innovative milieu.

No matter the approximation, as reported by Proulx (1992) it will always come from the systemic approach of social sciences.

Even if the concept of an "innovative milieu" has been studied in the literature more related to innovation districts, Simmie (2005) has indicated that there are inconsistencies in the definition of the "innovative milieu" due to the justification for the presence of innovative firms creates the medium for innovation, runs into contraposition with the argument that it is the means that make firms more innovative.

Additionally, and for the purpose of this research, I can also conclude that it is contradictory to associate the concept of innovative milieu exclusively with districts or merely learning regions because an innovative milieu is a space where innovative industries bloom.

Therefore, they are not necessarily concentrated in small areas and connected as districts; they spread in a more general and broader spectrum associated with regions.

For this reason and from the perspective of this research associating them only with aspects of learning or just districts does not demonstrate all their real value and potential.

It is within the ecosystem of SFIs that the milieu or region of innovation should be understood as the primary container that holds all the SFI. That is why all the spaces studied in this research, in one way or another, are contained within it.

5.2. Innovative cities

1630 / 232,100.000 m²/Boston City 4th world's most innovative city in 2015 by 2thinknow (2015) located in Massachusetts USA

1776/121,400.000 m²/San Francisco City 2nd world's most innovative city by 2thinknow (2015) located in California, USA

They are urban conglomerates of substantial dimensions, in which their inhabitants, trade and culture are characterized by providing solutions that in addition to improving their quality of life, promote economic opportunities, talent, culture, and social capital continually capturing value.

"Cities are a nation's innovation hubs, producing almost all patents and other measures of new products and processes in business" (Marceau, 2008, p. 136).

They are characterized by having projects addressing public transportation, housing, employment creation, economic development, business environment, technology,

education, health, and sustainability. These projects promote the implementation of profitable ideas and projects, thus becoming “the home” of innovative companies.

These spaces create “ecosystems,” in which companies and their inhabitants benefit from many variables that allow them to find success faster than in other cities of similar size.
As Marceau (2008) mentions, cities are the true heart of most innovation regional systems.

5.3. Districts

2013 / 3,108.000 m²/Quartier de l’Innovation Innovation District, the largest concentration of information technology and multimedia workers in Canada located in Montreal, CA, by the QI foundation

Spatial areas found within cities or in their outskirts, where institutions, incubators, accelerators, and companies in the forefront of industries are grouped and connect with each other in physically and accessible spaces, offering a mixed-use of services that favor innovation.

Simmie (2005) finds that empirical studies have increasingly demonstrated that there is a distinctive geography of innovation. He proposes that societies, organizations, and institutions found in a regional minority generate more innovation than the one developed by a group composed of other cities. Therefore, city regions are home to concentrations that are absolute, and superior to other kinds of zones that host this kind of space for innovation development.

Thus, during my research, I have found that two types are most prominent in this category:

5.3.1. Industrial districts (IDs) (small firms in the periphery)

1950–1970/19,425.000 m² / Fulton Industrial District in Atlanta region USA by CID (CID 2016)

Originally identified as the third Italy by Becattini, IDs are known for being a concentration of small companies within a region, in which significant exchanges between themselves "enabled them to introduce innovations and
tacit knowledge in specialized sectors such as steel—to adjust rapidly to changing demands" (Simmie, 2005, p. 799).

They are "not a matter of bounding an agglomeration of firms (in the same industry or several industries, complementary or different), but a local community which mirrors an industrial specialization and the way it (the community) is organizing the production" (Sforzi, 2009, p. 333).

A physical characteristic of industrial districts is that they tend to be located closer to the outskirts of cities or even outside of them.

Regularly, projects developed in these districts are more often oriented toward goods and consumable materials, instead of the service segment.

They are mainly composed of small companies with a business structure that is independently governed in order to intervene and produce in a geographic area.

The area is determined through mutual co-operation but establishes much more limited exchanges with industries outside their circle.

Districts can also be made up of middle-sized industries organized in regions that provide sub-industries, thus generating a habitable center composed of housing, as well as public and social services that allow employees to live near them.

These districts can be specialized based on the goods they produce (automotive, textiles, food, or similar) or around a typology of industry or market, or they may just be "sister" companies that complement each other through service exchange.

Pyke, Becattini, and Sengenbeger (1990) propose an interesting theory regarding industrial districts, which could easily be applied to the administration of innovation spaces. The innovation financing, work between competitors, and local production generated by them could turn into an advantage to encourage global distribution of the district-produced goods.

New industrial districts as identified, mentioned, and reformulated by Pyke, Becattini, and Sengenbeger (1990) are characterized by having innovation centers in small spaces because companies tend to connect and adapt to the changes required by the pressure of demand and reduce themselves into small, localized, and interconnected firms.

5.3.2. Innovation districts (entrepreneurs in the city)

2010/2,000.000 m²/Boston's Innovation District in MA USA by the City of Boston

The Innovation Districts are "Geographic areas where leading-edge anchor institutions and companies cluster and connect with Start-Ups, business incubators, and accelerators. They are also physically compact, transit-accessible, and technically wired and offer mixed-use housing, office, and retail" (Katz and Wagner, 2014, p. 1).

These spaces have subtle but meaningful differences when compared with traditional industrial districts.

First, they are oriented toward collaboration in entrepreneurship and are more associated with technology, service development, and business models. Cott (2012) christened this as the fourth wave of innovation, while traditional industrial districts focus more on industrial fabrication.

Second, industrial districts tend to be located on the outside of cities or their outskirts, whereas innovation districts are usually found closer to cities or even in the center of them. However, the most critical difference is that innovation districts are much more compact in

terms of space than industrial ones. They are considered a young trend and a manifestation of the recent mega-trends that are altering the placement and mobility preferences of people and companies. Thus, making them choose new locations inside cities and accessible through alternative, more sustainable means of travel.

The extension of these places covers mainly compacted urban areas, occupying a few blocks of the cities.

Within them, a collaborative innovation impulse rules. They seek to attract investors, entrepreneurs, and brands interested in developing innovative projects and processes. They seduce them through improving public spaces, new integrated architecture, housing offers, proximity to learning centers, entertainment, and investors, as well as through talented researchers and entrepreneurs.

The districts usually have participation from local governments, which find that public-private alliances are a way to develop or to recover depressed or unattended sectors of the city.

In these spaces, alliances can have some corporate or academic nature. The alliances with private companies, foundations, and government sectors are what shapes one of their characteristics.

Their results are not as research-oriented, as they are focused on business promotion and development, and their incubation.

They are emerging in dozens of cities and metropolitan areas in the United States and are firmly settled in cities like Barcelona, Berlin, London, Medellin, Montreal, Seoul, Stockholm, and Toronto among others.

At the same time, most innovation districts stick to one of the three general models

suggested by Katz and Wagner (2014), described as follows:

a. Anchor Plus

1950 & 2013/2,000.000 m²/Kendall Square in Cambridge, MA USA by the Cambridge City Council

Most are located in city centers, where they are anchored to well-known institutions, and thus, interact with a creamy base of companies, local business people, and spin-offs that contribute to innovation commercialization.

b. Urban reimagined

2000/2,000.000 m²/22@ Barcelona—El district de la innovació SPN by the local authorities of Barcelona

Located close to historical piers, old historic factory buildings are transformed into modern, physically and economically suitable spaces. They benefit from easy access to a historic stock and the proximity to city centers.

c. Urbanized science park

2012/2,090,318 m²/Research Triangle Park, North Carolina USA by the Research Triangle Foundation

Usually found in suburban and extra-urban areas, they are usually isolated and become expanding areas of innovation. They are urbanized through a higher density and collateral activities, such as businesses, small shops, restaurants, and attractions that are born and integrated to the place.

For Katz and Wagner (2014), the fundamental principle of these innovation districts consists of providing and cultivating economic and institutional assets within an environment of vibrant innovation where physical assets such as public spaces, private buildings and open spaces, streets and other works of infrastructure are designed to stimulate newer and higher levels of exchange and innovation.

5.4. Specialized learning environments of innovation (SLEI)

1861/17,870.000 m²/Massachusetts Institute of Technology (MIT) The world's top university QS (2015) for 2015-16 located in Cambridge, Massachusetts, USA (IP 2016)

I have named these spaces SLEI, to indicate they are intended for the teaching and learning of processes related to innovation which retain a tight relationship with instructional practice. They can have two vocations or orientations: Academic and Vocational

Some teams have taken on the task of rethinking the use of said spaces, identifying that operating factors, as well as technological resources, are of great importance in revolutionizing the views on higher education courses, the group of the University of Bristol, JISC (2006) argues that well-designed SLEI have a motivational effect if they meet these characteristics:

- Customization and inclusion: Priority must be given to enabling, instead of controlling, access to learning with a user-centered approach.

- Flexibility: Have a flexible concept to satisfy the needs of a variety of students. Their spaces usually have a changing organizational characteristic; the elements that constitute them can grow or shrink depending on the kind of teaching taking place in it.

In turn, I subdivided, and classified these spaces as follows:

5.4.1. Universities, Colleges and Academies

1885/1,412.126 m²/Stanford University in Stanford, CA USA

They are considered facilities for higher education and research on innovation. The quality of their courses, professors, researchers, government alliances, and talent are fundamental parts of their strategies.

They are the center around which learning development and science revolve and converge. They are educational spots for different entrepreneurs.

These academic centers award degrees and titles and are designed for the instruction, testing, and advancement of students in the subject.

Historically, Universities have been the spaces responsible for the creation, promotion, and diversification of SFIs. This responsibility comes from their relationship with government sources and support, as well as an association with public and private industries that promote innovation. In other cases, they act as knowledge hubs for the regions.

The spaces of colleges and institutions that offer postgraduate courses have also influenced the development of innovation and are recognized SFIs primarily when they act in conjunction with research centers and even specialized publications.

5.4.2. I-Institutes

2011 / 7,400 m²/IDIT — The Institute of Design and Technological Innovation (IDIT) in Mexico by U Puebla
2009/16,072 m² /UMass Amherst Integrated Science Building in Amherst, Massachusetts USA by Payette

These types of spaces combine teaching and research within buildings, laboratories, workshops or a mixture thereof. They configure departments and academic units as a part of a university teaching center to facilitate research and collaborative teaching, looking for innovation in their departments oriented to develop multi-disciplinary work.

They were initially intended for academic research, representing a commitment to the exploration and discovery of innovative projects among the university campuses, through the interaction and collaboration of scientists, companies, students, entrepreneurs and universities.

They are somewhat similar to I-schools, but the main difference is that I-schools are more focused on design and design thinking processes, while I-Institutes are more focused on mixing all the possible disciplines of the university campus in which they belong with no necessary connection with design processes.

Among these I have identified two main trends:

- Those who seek to integrate academic labs, Fab labs, business incubation areas, exhibition spaces for students, multipurpose rooms for classes, i-rooms, etc., looking to mix both entrepreneurship and collaboration opportunities.

- And those who seek to focus on a single area of knowledge, paying more attention to specific academic research, such as biotechnology, electronics, mega data, or the like.

  In this category, the collaboration is based mainly on teachers and students who can sometimes receive challenges from the industry or university to solve projects for purely academic purposes.

The primary objective of the I-Institutes is to bring together under one roof the different opportunities that the school identifies for innovation, trying to create moments of encounter between its cohabitants.

Today, this kind of facility seeks to maximize daylight and to articulate in the space a whole set of laboratories, from computer sciences to chemistry and biology, in harmony with quality office space, entertainment, and common areas for the students, etc.

5.4.3. Business schools

2009/12,800 m² /IBC Innovation Factory in Denmark by Schmidt Hammer Lassen Architects.

2014/22,482 m²/Yale School of Management in New Haven, CT USA by Foster + Partners

They are spaces for education specializing in teaching relevant subjects for business model innovation or service creation and management, established as one of the fundamental actors in the innovation ecosystem.

They offer different programs related to commerce, economy, management, and finance.

These spaces frequently work together with other departments, campuses, and companies to develop side projects. They are often associated with the development of significant entrepreneurial projects, business promotion centers, and accelerators, thus contributing to the innovation ecosystem.

Authors such as Fixson, Seidel, and Bailey (2015) have analyzed the positive effect of design areas inside these spaces to promote innovation. Spaces like the Harvard Innovation LAB or the D. school at Stanford have been created in them, contributing to the construction of new innovation trends like 'design thinking,' among others.

One example is the Stanford's Business School, founded in 1925, today it is considered one of the best in the world thanks to the quality of its program and its faculty and staff, which includes Nobel winners, some members of the American Community of Arts and Science, and members of the National Science Academy.

As one of the seven schools in Stanford University, it offers a master's program in general Business Administration (MBA), the MSx program and a Ph.D. It also offers a series of joint degrees with other departments of the university.

This school does not just stimulate innovation on campus; it also maintains a close relationship with leading companies in Silicon Valley.

5.4.4. i-Schools

2014/19,903 m—/UTM Innovation Center, Mississauga, ON, Canada by Moriyama and Teshima Architects

This emerging trend of schools that I named i-Schools are specialized learning centers built as precursors of a global trend that currently influence traditional design schools and academies around the world. They are based on methods like design thinking, social thinking, and technological entrepreneurship.

Basically, they are spaces cohabited by design faculty offices and physical environments that promote multi-disciplinary sharing, encouraging the active learning of innovation among their students, industries, and professors to generate projects with a high innovative content through design and business practices.

These spaces are frequently filled by business, design, technological, economic, management, and finance schools that interact among their departments as well as entrepreneurial programs. External industries also seek to promote the creative development of projects with a clear business perspective.

Classrooms, buildings, laboratories, co-working rooms, workshops and social spaces for the purpose of cultivating an ecosystem that actively promotes divergent thinking usually compose these spaces—thus, generating unique SFIs that cover new materials and technologies as well as changes in the distribution of furniture, illumination, new methodologies and processes, as said by the SUID (2016).

For example, Domus Academy founded in Milan the first postgraduate school in design and fashion in 1982 as it was establishing itself as the capital of design and fashion.

Under the format students and professors meet to exchange ideas with representatives of Italian industry, including renowned world-class designers like Andrea Branzi, Ettore Sottsass, Denis Santachiara, Philippe Starck and Alessandro Mendini. The school is in

charge of directing projects developed by students from more than fifty nationalities under the methodology they denominate “learning by designing.” (Domus Academy 2015)

For a year, the students focus on solving real-life problems and mix with other campuses to promote multicultural exchange. One of its star programs is their Masters in Design Businesses (known as one of the best in the world) in which they work on projects related to design businesses and business design to achieve innovation.

From Innovation Schools two models stand out:

a. D. schools

2005/10,668 m²/D. schools Hasso Plattner Institute of Design in Stanford

Part of the idea of a mechanical engineering teacher at Stanford, David Kelley, and George Kembel, who in 2004 began a project together with the University and the Hasso Plattner Institute, from the University of Potsdam in Germany, creating the D. School project in 2005.

Inspired by design consultants at IDEO, they established an objective of integrating business management training and traditional engineering training with product design education in just one model stimulated by design-thinking principles.

The D. school does not award degrees, and they are not linked with any individual Stanford department. It is all based on a model in which the students can take courses that intersect their majors.

Even though the D. school is in a physical space like the one at Stanford’s business school, its influence in methods and physical configuration of spaces to promote learning and work on innovations is famous. Nowadays, it has expanded to some other campuses, mainly in Europe and America.

These learning spaces present three types of differentiated areas:

1. Needs finding spaces: Places where you interview and observe users and other interested parties with the intention to better understand the shoppers, clients or costumer's behaviors.

Spaces where the user is interviewed and observed with the intention of "walking in their shoes," When these qualitative methodologies are used, with video-documenting tools and physical documents, information inherent to the beneficiary, industry, and competitors are gathered.

2. Ideation spaces: Places and elements focused on creativity, their objective is to get their occupants to generate a significant number of ideas supported by environments that offer creative stimuli and avoid distraction.

These spaces favor visual thinking. They count on tools that allow the rapid registry and exposition of ideas through the visualization of sketches, diagrams, and concepts.

In them, vertical panels, sofas, paper, pencils, screens, whiteboards and even post-its are always available.

The objective of the physical space is to provide big work surfaces (usually vertical) to visualize ideas and sketches quickly.

3. Prototyping activities: They are spaces that seek for the user to concentrate on the reduction of uncertainty and to have the tools needed to execute or make possible tangible ideas according to Fixson, Seidel, and Bailey (2015).

Spaces that support this process adequately provide access to tools and materials

needed for the elaboration of quick prototypes, they provide prototyping cart elements for the elaboration of light prototypes, as well as complex tools, materials, and spaces of Workshops 7s.

One of the examples is The Paris D. school, a consortium of 5 schools (ENSAVT, Esiee, UPEM, EIVP, ENPC) that cover disciplines from engineering to business and financial architecture as reported by Hillen (2016).

This project was born with a subsidy from the French government and was presented in 2011. Its objective is to develop efforts for excellence in innovative training in France.

In this space, the future leaders of innovation are trained to develop new economic activities inspired by the design thinking practiced in Silicon Valley.

b. Design factories (DF)

2008/3,000 m²/Aalto Design Factory in Espoo, Finland by Aalto University

(DF) s ground their processes in experimentation and trying things in real life. They are defined as a greenhouse where "big things are developed and cultivated from small seeds," "A home for everything from academic to nonacademic, student-driven and ambitious projects to growth businesses." (Aalto university 2015 p.1)

The Design factory was created as a project at the Alto University in Finland, with the purpose of hosting three different disciplines (engineering, art, and design), and the School of Economics.

The Design factory is one of three collaborative and development platforms the school has. Its purpose is to become an environment of constant learning and research in close co-operation with the industry that is specifically related to product design and

development aspects.

In this model, the facilities are designed for use 100% as flexible workshops, boardrooms, meeting rooms, cafeterias, and food stations (where the traditional breakfast coterie take place) and they are complemented with a machine room (where the students have developed part of the technology and automation software) and a prototyping room.

All these spaces are open to serve students, teachers, and business partners such as Nokia and Kone, and there is space for non-profit organizations. These organizations have small offices within the space to establish joint co-operation.

The space is an experience based on identity and innovation, which can occur from collaboration cocktails (where people can test their ideas and implement them) to meetings in a recreation area with a sauna.

Their model of co-creation with the industry is essential and is articulated through product design courses that work in partnership with different companies of the sector and together with a network of partner universities hosting more than 30 projects sponsored by industry every year.

This model of learning spaces type has resonated with schools located on five continents.

5.4.5. Vocational environments

2011/11,000 m²/ROC Mondriaan Laak II in Den Haag, The Netherlands by LIAG

2013/150 m²/Casa Rana in Tiruvannamalai, Tamil Nadu, India by Made in Earth

2010/9,328 m² / Vocational Education Center in Gordola, Switzerland by Durisch + Nolli Architetti

They are spaces of highly specialized vocational training in line with the type of job or

training related to innovation that is pursued, and the usage of learning technology. Therefore, their requisites and configurations are very diverse and may vary according to the environment, craft, equipment, size, and infrastructure.

They are characterized mainly by their high level of functionality and because the demarcation of workspaces and teaching spaces is well established.

They use flexible and straightforward concepts that allow them to adapt to each context. In some cases, they turn open areas intended for training activities into future offices or workspaces that stimulate concentration and vice versa.

The concept of these spaces has a design approach centered on the user. It seeks for students and professors to be able to experiment in a professional environment, paying particular attention to the local context regarding resources, building materials, and identity.

5.5. Research centers

1951/+, 929,030 m²/Stanford Research Park World's first University-affiliated business park in Palo Alto, CA, USA by Stanford University

They are spaces dedicated to research that sustain collaborations on different levels between universities, industries, and governments, to develop innovations.

In them, at least two out of the three components are linked with the intention to create economic developments, which are usually related to high-tech promotion of the advancement of knowledge.

Within these, I have identified three main typologies:

5.5.1. Research—science—technology—bio parks and technopolis (RSTP)

1970/145,540 m²/Cambridge Science Park Cambridge UK 1993/47,000 m²/Technopark Zürich in Switzerland.

2010/1,500 m²/The Skolkovo Innovation center, Moscow RU

2011/17,200 m²/Chayi Industrial Innovation center by Bio-architecture Formosana

2014/24,721 m²/Central Taiwanese Innovation Campus by Bio-architecture Formosana + NOIZ Architects

2015/35,300 m²/Oslo / Oslo Cancer Cluster Innovation Park by Dark Arkitekter + Arkitektpartner

Places dedicated to commercial research; mainly concentrating on promoting products and innovations, characterized by a balance between the comparative and academic aspects.

Here, physical resources like the lobby, security, restaurants, office buildings, convention center, and banks are shared, thus offering a countless number of advantages for the hosted companies.

This type of facility experienced its growth in the United States when, in the 1950s, the first of its kind was located in the vicinity of Stanford University. It then became the precursor for what we now know as Silicon Valley.

They are usually financed by an alliance between a higher education institution and the private industry or the government, where the university is the central axis around which the projects revolve.

The compatibility between universities, government, and industry is its most prominent bonus, and they were the main contributors to the innovation regions process.

5.5.2. University research centers/innovation centers and campus (URCS)

2013/11,990 m²/Innovation and Technical and Technological Transfer Park in Chihuahua, Mexico by Group Arkhos

2014/49,367 m²/Florida Polytechnic Science, Innovation and Technology Campus, Lakeland, FL, USA by Santiago Calatrava

2015/43,000 m²/Boldrewood Innovation Campus Southampton-UK/Grimshaw by Grimshaw

These spaces are considered to be non-departmental and non-academic units, mainly covered by university teaching centers, as a way to facilitate collaborative research through innovation in one of their schools.

They are different from research institutes because these are oriented to the development of multidisciplinary and collaborative work between different schools and multi-university initiatives provided by research services for the community served.

Universities' research centers (URCS) are considered the hottest spots for innovation.

Their facilities have installations for administrative, academic, and even residential support, which promotes interdisciplinary interaction between students and professors.

As spaces related to research and higher education teaching, they are based on the construction of classrooms and teaching, not technical laboratories, as well as spaces for specialized research laboratories.

This kind of facility also includes faculty offices. Their current design emphasizes the development of joint areas with multipurpose rooms that can be adapted as rooms for conferences, ceremonies, events, exhibitions, or just as study halls and student lounges.

In these places, researchers share common areas outside of their usual territories in the university.

Toker (2004) states that the idea of creating informal common areas shared by several universities research centers do not necessarily enable information exchange. The main tendency of university researchers is to stay in their research territories (offices) and it is uncommon to see them using said common areas.

Therefore, if these spaces are designed with the goal of enabling face-to-face meetings, the

probability for innovation can be increased, encouraging the participants of said meetings, in which the design can motivate them to walk short distances.

Then the aim of favoring coincidental consults and non-programmed visits to research units are achieved.

Per Toker (2004), many of the processes that drive innovation takes place in the working areas of these spaces and their connections.

One of these examples is the USTAR Innovation Campus Building located over 35,966 square meters in the Utah State University Innovation Campus. It hosts several biological science laboratories and projects to find the cure for a variety of human and animal diseases. (Poppleton 2015)

5.5.3. Corporate research centers (CRC)

2002/Decentralized m²/Airbus Group Innovations operates a global network of corporate Research and Technology Laboratories

They are spaces similar to (RSTP), because I+D activities are developed in them, but the difference is that the (CRC) has a corporate vocation, and its research is often related with high-risk explorations, financed and directed by high executives of private companies or foundations, in which they devote their efforts to the advance of their interests regarding commercialized products and services.

These spaces focus on long-term research, with an intention to create and develop future products, aligned with the goals of the companies or foundations that shelter them. Research made there is usually related to fields such as medicine, biotechnology, and food, all the way to new technologies.

Most of these spaces have dedicated areas for administrative processes that connect with

spaces for research and development that can sometimes be decentralized.

Two space typologies can also be found in this category:

a. Corporate-oriented

2010/34,374 m²/Tesla R&D Labs and Test Shops in former Hewlett-Packard semiconductor plant Paolo alto CA, USA

1967/158,000 m²/ABB Corporate Research Center in Baden-Dättwil, Switzerland

Formed by a dominant or sister company that belongs to the same economic group.

They can even be integrated to industrial plants or be immersed inside a corporate campus, or concentrated through a global network.

For example the Airbus Group's global research and technology network it is organized in seven transnational technical capability centers focused on creating value through technological innovation stemming from alliances with different strategic group partners, and in addition to primary locations in Munich and Paris, it also has branches in Spain, the UK, France, Germany, Singapore, India, China and Russia employing more than 800 people (ADMACOM, 2013), working hand in hand with universities and world-known research centers.

b. Foundation oriented

1953/Decentralized/Cancer Research Institute in Broadway New York, USA 2012/6,000 m²/Flinders Center for Innovation in Cancer, Australia by Woodhead

Mainly led by foundations that devote their efforts to the search for solutions of different kinds of global problems.

They sometimes gather or concentrate several companies in their campuses, other times they act in an entirely decentralized manner with headquarters that are located

in one place, and research and development facilities that are somewhere else. Usually, their spaces have easy access to metropolitan areas in a way that allows them to connect with different environments.

5.6. Corporate campus

2016/853,440 m²/ The Apple Campus 2, the world's first macro campus of its genre in Cupertino, CA, USA by Foster and Partners

A land site for hosting an innovative company, organization, or community in a private space of limited access, restricted to the members who somehow are connected to the corporate system.

A remarkable phenomenon is happening with new spaces dedicated to innovation. They are provided by private companies or closed corporations that belong to business companies owned by non-governmental people or in which most of their shares belong to a relatively small group of shareholders or members that control most operative decisions.

They are spaces that cannot just be considered in the category of buildings for innovation, or innovation districts per se, and they cannot be cataloged as conventional corporate offices.

They are spaces that have turned into the innovation poles because the directive boards of the entities that occupy them consider making the spatial use a strategic priority. Sometimes they could include social innovation centers/ labs and foundations with the objective to develop their businesses.

Forget about the classic icons of architectonic design, now small, medium, and large companies lush in ideas that devote significant budgets—in line with their revenue and scale—to create iconographic and functional projects that seek to challenge new

paradigms and reinvent others.

The buildings of macro corporations are reorganizing the architectonic and spatial scene, making old GBPFs look like incipient efforts.

The time of spatial innovations led by governments seems to be over, giving way to innovation by corporations.

If the U.S. national defense administration building, “the Pentagon,” could have been considered as an iconic construction at its time, its place in collective imagination will soon be taken over by Apple’s new “spaceship” in Cupertino.

On a smaller scale, companies with moderate budgets also try to compete and to recreate new standards for their employees, at their level. Today no one gets away from this trend.

A tendency that was driven, in part, by the circulation of company money, as well as innovations in technology and materials, and the scientific exploration of the subject.

These are today’s new innovation areas in which everyone, from the most prominent industry to the smallest start-up, tries to improve their competitive position by intervening in their spaces.

Not having found a suitable classification for this type of campus, I propose the following four dominant typologies:

5.6.1. Macro campus

2001/290,000 m²/Googleplex California HQ, Mountain View, Ca USA by Clive Wilkinson Architects

2017-19/457,200 m²/Google’s new California HQ, Mountain View, Ca USA by BIG and Heatherwick Studio

Mixed spaces, mainly dedicated to offices and research facilities belonging to large corporations, which occupy an area two to three times bigger than the average of its peers.

They have large budgets that generally involve public investments and agreements with the cities.

Two examples of this research stand out:

The Apple Campus 2 in which the renowned architect Norman Foster, in association with Keyser Marston Associates, was in charge of projecting a new space for the company in Cupertino.

Within a campus of 853,440 square, with 712,247 square meters of trees, emerges a structure of curved panels and 12-meter long walls in concave glass, which began its construction in 2011.

Steve Jobs announced the plans for Apple's new corporate building and its inauguration is projected for 2017[26]

The exciting thing about this building is that the company launches its theatre releases within the same, a tradition that had been institutionalized since the Jobs era but was usually done in rented spaces in Silicon Valley. The space will turn into the heart of the place for their new product releases.

Previously, Apple had to rent a building from a third party, but inside this new and impressive circular campus surrounded by trees, every product release will take place in

[26] Aliaga, Fer. (2011, October 5). *Steve Jobs Last TV Appearance at the Cupertino City Council.* [Video] Accessed March 27, 2015. https://www.youtube.com/watch?v=06QqipaAvGY.

Cupertino.

Apple's theatre will occupy 36,576 m² and is entirely underground. It will be able to host more than 1,000 people.

The circular space, which looks like a gigantic white donut, has a lobby at ground level that will give visitors a 360º view of the area

The whole place will be crowned with an 80-ton ceiling that is considered the biggest independent carbon fiber structure ever (Foster + Partners 2013)

Besides many innovations that are kept as a secret, the white concept's contrast with the forest in which it is built is shocking.

An improved version of the Pentagon, except this time it will not be dedicated to the national defense. The apple headquarter will be dedicated to the administration of the technology giant and completely circular to reflect their identity.

The second one is Google's new campus is another example of buildings projected and built to develop innovation.

The European architects Bjark Ingels and Thomas Heatherwick conceived the complex and it is considered an impressive proposal that integrates nature with the offices.

The company's new headquarters, located in Mountain View, California, is a space built with a series of mobile structures and translucent canopies that will host half of the 20,000 employees that currently work in the city. It will be located in the North Bay Shore district in the Bay area in San Francisco.

This kind of construction can be considered as innovation districts "per se," because it is not just Google's offices that have been proposed. It is a "great scale urban intervention that

includes housing, bicycle ride, green areas and other businesses, companies, and housing complexes" NBC. (2015, 27 February). and due to this fact, it is still a corporate campus because it is led and created to serve the purposes of the technological giant.

The proposal of this SFI is based on the ease and possibility to create corporate spaces that integrate with nature under a translucent cover.

One of the most essential features of the complex will be its flexibility and its internal structures that can be adapted or replaced, as the corporation's needs change. This feature guarantees sustainable growth and evolution; a life building that can be transformed in line to the needs of the company (Cameron 2015).

It will be "more like a Workshop than a corporate office," says Bjarke Ingels, "trying to maintain the sensation of having an environment that someone can actually hack if they really want to" and "does not look exactly like a boring office building." [27]

Google's complex is not only seen as a responsible and innovative architectonic design but as an SFI. That is how the trend of imposed macro spaces for great enterprises turn into innovation poles surrounded by trails of trees, nature, and bicycles.

5.6.2. Mid-campus

2010/253,300 m²/Giant Interactive Group Corporate Headquarters in Shanghai, China by Morphosis Architects

2011/370,000 m²/GlaxoSmithKline's Admin Building in Quebec, Canada by CoArchitecture

2015/37,790 m²/JTI Headquarters in Geneva, Switzerland by SOM

2015/10,000 m²/Euronews in Geneva in Lyon, France by Jakob + MacFarlane Architects

The HQs of different multinational companies are starting to be rethought around innovation, and even if they lack the vast budgets that technology giants have, they

[27] Dezeen. (2015, March 5). *ww.dezeen.com*. [Video] Accessed MARCH 25, 2015. https://www.youtube.com/watch?v=NiAx8dbphBo.

are big enough to use their investments for the development of new, latest-generation headquarters all around the world.

Usually, these space projects are hosted in technological parks or are part of industrial districts, but we can also find them as urban initiatives and integrated city plans.

5.6.3. SMEs campus

2014/2787 m²/PCH International Innovation Hub in San Francisco, CA, USA by Chrdauer Architects

Today, millions of small and medium companies actively contribute to the innovation ecosystem. These are the office spaces for architecture, design, advertising, innovation, idea laboratories, production companies, and growing technology companies that have reached economic maturity, which allows them to own and transform facilities.

For them, the corporate space reflects their philosophy and becomes a strategy to not only keep their clients and employees happy, but also to sell their brand as a free, fresh, contemporary spirit and, at the same time, optimize their innovation processes.

5.6.4. Garage Lofts

2015/500 m²/Gartner Innovation center in Israel by Studio BA

We are now in the fourth wave of innovation (Scott, 2012); one in which innovation does not happen in "garages" or college dorms anymore—spaces that became famous thanks to Steve Jobs and Mark Zuckerberg

Currently, "the garages" have evolved and even though they are still, in some cases, messy spaces, they are better planned and less improvised. Nevertheless, garages, design studios, and lofts are still relevant in the innovation process according to Hillen and Camacho (2015).

They are the favorite spaces of many entrepreneurs who want to emulate the success stories from Silicon Valley. They find a look that reminds them of the spaces used by the first Silicon Valley entrepreneurs, which makes them, in a way, a “landmark” in their spaces.

Under the title garage lofts, I have classified all these start-ups, studios and offices that have recently been created to emulate, in some aspect, the “garage” look, and now are incubating inside a bigger corporation, university, accelerator, office building, or entrepreneurial center. They are designed to achieve a practical functionality and not just a status or appearance, thus becoming the space of start-ups and technological entrepreneurship.

That is why the garage Loft style influence may be found in office spaces, rooms, and as said by Fixson, Seidel, and Bailey (2015) big corporations also use it in the design of their SFIs, also Jain, Kim, Marawar, Patel, Saso, Sheetz, Sini, and Yu. (2015) indicate that it is a concept commonly used in co-working spaces.

5.7. Government Buildings and Public Facilities (GBPF)

2013/1,514 m²/St. Elisabeth’s East Gateway Pavilion in Washington, DC, USA by Davis Brody Bond

Spaces that are government property developed to promote actions or results related to innovation and technological advances.

With a smaller boom than corporate campuses, in the past few decades, government-promoted SFIs have been known to cover from research centers to social and cultural areas.

These places are found in common and private areas of public buildings and even in facilities that host projects for military, biomedical, and social industries, among others.

Some of them are promoted as spaces for mixed uses, consequently providing environments for public, private, and institutional investments with multi-purpose structures that offer different options for the communities.

That is how the citizenship can meet, research, and exchange knowledge in public places such as libraries, or organize cultural and artistic events in public squares and parks.

In recent years, many of these spaces seek to create iconic and visible architectures within the concept that inspires functionality and simultaneously provides sustainable environments.

Therefore, governmental offices, laboratories, and certain public facilities invite architects and designers, through very publicized design contests, to create avant-garde proposals. This demonstrates the government's support for innovative proposals, which also can act a propagandistic way to show the politicians' commitment to growth and cutting-edge development.

5.8. Innovation buildings

2012/1800 M²/Knox Innovation Opportunity and Sustainability Center in Melbourne, AU by Woods Bagot
2014/4820 m²/Wood Innovation Design Center, British Columbia, Canada by Michael Green Architecture

Towers and buildings composed of permanent structures that have as an objective to host individuals and activities that benefit the development and promotion of innovation.

Towers are physically taller and thinner; buildings are wider than they are tall. In both cases, their objectives consist of serving a countless number of projects that are focused on the promotion and/or development of innovation. Within them, I have identified two types that stand out:

Structures in towers that are adapted, projected, and built to foster innovation development have become more relevant in the past decade, and a new category of building— “innovation towers” has bloomed.

These buildings of avant-garde architecture and design are frequently destined to promote or spread innovation in an area, district, or region, thus replacing old edifications, activating quality city projects, or being part of an ambitious urban plan led by non-profit organizations, universities, private industries, philanthropists, or even governmental funds.

I classified them as follows:

5.8.1. Real state Landmarks

The idea consists of creating emblematic architectonic icons with efficiently attractive structures that act as urban milestones integrating city projects or districts.

In this category three types where identified:

a. Updated classics

2013/130,064.256 m²/Boston Innovation and Design Building, the USA by Jamestown L.P

They are buildings or small towers in which old factories, warehouses, or public edifications make way for urban recovery projects, with the aim of attracting investments, and providing new functionality to the area.

They are promoted as a green trend where the intention consists of upgrading an old building, benefiting from financial advantages, and saving remodeling time. It also represents teaming up with sustainable projects that promote energy efficiency.

In these spaces, the Loft style dominates because old factories or warehouses become the new habitats that allow the concentration of numerous enterprises' offices, governmental projects, Design Studios, collaborative innovation spaces, and research centers.

b. Brand new Towers

2018? /unknown m²/ Miami Innovation Tower, Miami, FL, USA by SHoP Architects

Something that distinguishes them is that they are frequently projected by renowned architecture firms and are destined to serve mixed initiatives. They contain hybrid spaces that integrate offices, classrooms, studios, research facilities, and even housing.

At this regard, the Miami Innovation Tower designed by the SHoP Architects firm in the entry to Miami's innovation district, it is going to rise as a kinetic sculpture looking to become a new icon of Miami.

This project will be a space that hosts companies focused on information technology and will have shops, a wide area of public gardens, an amphitheater, restaurants, and exhibition spaces, including an observatory more than 137 meters high. (Miami Innovation District 2015)

c. Corporate Milestones

2016/1,219.200 m²/The Amazon Campus 2, Seattle, WA, USA by NBBJ

Monumental and modern buildings of recent design, funded mainly by private capital that become the powerful symbols of their eclectic culture and that reflect the values of their company owners, through a manifesto both visual and functional that allows them to blend all the most relevant aspects of their innovation development in a modern environment.

Amazon Campus, which could also be classified as a corporate campus, is one of the

examples of a Corporate Milestone. The technology giant hired innovation firm NBBJ to design its new operation center, which stands out as an iconic group of buildings in the center of Seattle.

This new futuristic complex envisages three interconnected glass biospheres of thirty meters each with more than 3.000 species of plants spread around one-acre greenhouse.

In this project, the company opts for the city, while many competitors and corporate companies prefer to pull out of it (Microsoft and Nintendo). However, Amazon considers that its campus will be revitalized if it stays inside the city. (Wingfield 2016)

5.8.2. Learning icons

2014/15,000 m²/Jockey Club Innovation Tower, the first permanent architectural design in Hong Kong by Zaha Hadid Architects

2015/14,400 M² /Ryerson University Student Learning Center in Toronto, ON, Canada by Zeidler Partnership Architects, Snøhetta

These spaces are frequently linked to educative activities, cultural promotion, and social innovation projects. And they are spaces where the learning and teaching processes occur in a more natural way.

They are usually towers associated with squares, plazas, study areas, libraries, rooms and other places that increase the students' motivation and generate a positive impact on their capability to innovate.

Sometimes they are part of the campus of a well-known institution and are considered open spaces for meetings and conversation, in which the interaction between students, professors, and community members occurs more spontaneously.

Their main characteristic is that they are connected to a blend of services, allowing

the community to develop its own identity. This is possible because the space provides the occupants with exceptional collaboration environments that allow them to exchange ideas, beliefs, customs, and behaviors, thus favoring innovation.

For example, in 2007, a small building was demolished to make way for a grand tower dedicated to innovation sponsored by The Jockey Club of Hong Kong projected by the architect Zaha Hadid.

The Jockey Club Innovation Tower (JCIT) was created and become home to Hong Kong Polytechnic University (PolyU) School of Design, and the Jockey Club Design Institute for social innovation.

5.9. Labs

2015/3,593 m²/ Laboratories UFScar in São Carlos "one of the first buildings of its type, within the University, and one of the first ones in the country, to offer specific installations and an adequate structure for advanced research" (ArchDaily—SP, Brazil by Vigliecca and Associados).

Spaces equipped to do experiments related to science, research, and promotion of innovation. They are usually destined for the design and/or teaching and not for fabrication.

Since laboratories for innovations are located at the center of research and training, they can be based on individual rooms up to complete buildings.

In agreement with the National Institute of Building Sciences (2016), they are considered essential for the past, present, and future discoveries and advances.
Therefore, scientists coming from the public and private sectors, and industries such as biomedical and pharmaceutical, are invited to these spaces to cross the borders of knowledge.

In the innovation territory, the labs focus more on discovery, and some authors like Porter (2001) consider that this is where true innovation happens. As I have argued before, innovation does not happen when a discovery happens but when it is implemented and reaches the market.

At the same time, it is true that many discoveries, tests, and knowledge are consolidated in these specialized centers, from wind tunnels to particle accelerators, reactors, scientific fusion installations, advanced computer centers, etc. can all be considered in this category.

Laboratories can be classified by sectors, and by types such as wet and dry as suggested by the NIBS.

Fab labs, Mad labs, or citizen labs that come from mixed initiatives between private, academic, public and hacker entrepreneurship, are where results arise from spontaneous collaboration between its members. In this research, due to their unique characteristics, I have classified these kinds of spaces as DIY spaces.

These are the most common typologies of laboratories:

5.9.1. Academic/university labs

2008/1672 m²/ Graduate Aerospace Laboratories in Pasadena, CA USA by John Friedman Alice Kimm Architects

2011/914 m²/CITE Game Innovation LAB in New York, USA, by Beyer Blinder Belle.

Spaces intended for academic research, which are incubated or located within facilities mainly controlled by universities. In them, the leading researchers are professors from those universities who work under a common understanding with students.

Sometimes these spaces are financed or supported by external parties, big corporations, and

private investment funds that are associated with universities. In some cases, funding can also come from the state.

This kind of laboratory has as its primary purpose to teach through research, which makes them a scientific training center.

One example is the CITE Game Innovation Lab in the New York University's Engineering School, located in Brooklyn, occupies 914 square meters. Finished in 2011, with an approximate cost of $1.1 million, it was designed by the Beyer Blinder Belle architecture firm.

This laboratory is NYU's flagship project. It brings together students and professors from different disciplines to explore the future of digital game design.

Its design seeks to bring together robust technologies and audiovisual infrastructure, and classrooms appropriate to facilitate research in a compact space.

Its spaces include flexible meeting rooms, projectors, mobile areas, boards and flexible furniture.

The place, with combinable desk surfaces and living room type chairs, falls under a concept of a homey academic space that emulates the sensation of playing at home, according to Milder Office (2014)

5.9.2. Government laboratories

2013/1440 m²/INRA Research Laboratories in Lorraine region, France by Tectoniques Architects

Within this category, we allocate laboratories and research centers that belong to, or are funded or mainly financed by the government.

Although government research facilities are like private sector facilities, they usually have few, or no, training laboratories.

Government laboratories fulfill different functions, among which is testing the results of research conducted by the private sector.

5.9.3. Corporate labs

2004/17,000 m²/Ferrari Operational Headquarters and Research Center in Maranello, Modena, Italy by Studio Fuksas

2014/9,400 m²/Carlsberg Innovation, Research and Development Center, Obernai, France by S&AA

2012/325 m²/Capital One Labs in Arlington, VA, New York and San Francisco, CA United States by Studio O+A

Similar to state or government laboratories, they are different from research centers because corporate labs focus more on closed innovation processes, limiting the access and socialization of I+D to their own context.

Therefore, the research conducted within them is primarily autonomous, secret, controlled, and the collaboration with other institutions and/or universities is limited. Some of these centers have exhibition areas and showrooms inside their facilities where they can showcase the results of their research and promote their corporate innovation culture.

Within them, offices and laboratories exploit natural light and reflect their defining innovation. They also show a recent interest in building environmentally sustainable

facilities that reflect the space's identity in relation to the corporate principles of the company to which they belong.

This kind of space is usually found near or even inside the corporate campus. Moreover, they are equipped in a way that allows scientific experimentation and research centered on their products, services, and needs.

Within this category are labs dedicated to research and product development in industries such as biotechnology, pharmaceutics, transport, military, robotics, aviation, automotive, and aerospace, among others.

They can become, or include, Living Labs to enable "in situ" research such as habitat simulation, wind tunnels, workspaces, and even testing fields and tracks.

Corporations of private or mixed capital can finance these spaces. Some of them are even intended for the fabrication of their own goods, such as the production of medicines and chemical products.

5.9.4. Living and home labs

2012/300 m²/Living Lab Montreal in Canada

2002/400 m²/Philips HomeLab in Eindhoven, The Netherlands, by Philips design 2011/650 m²/The Citi Innovation Lab in Singapore by Citi group

They are exploration and research spaces, which work with users as guinea pigs.

In the new landscape of open innovation, the Living Labs experiencing considerable growth internationally, and that, in several sectors (Dubé, Sarrailh, Billebaud, Grillet, Zingraff and Kostecki., 2014). These spaces use work methods to integrate users into the development process. As such, they favor experimental experts in the co-creation and evaluation of products, processes and projects.

This kind of laboratory is closely related to research centers in the 90s thanks to the promotion and study of the value of ergonomics, and authors like Von Hippel (2007) have described the importance of understanding and working with the users in their context to develop innovations.

For example, reality TV shows such as 'Big Brother' could be a sort of living lab where the observer learns about the actor's behavior in a place that simulates a real-life space.

Its infrastructure requires technical resources for observation such as video cameras, sound and audio recording machines, translucent materials, hidden Gesell cameras for secret observation, intercommunication elements, movement or heat analysis maps, among many others.

Others implement tools such as diaries or registry documents, where every so often the users document their experiences and thoughts. Some of them look like cabins; others can just be working stations or even gadgets connected to the users.

One of the initial efforts was developed by Philips/Whirlpool Italia, which, in its Central Industrial design center, created a space for usability analysis, and put up a system of Gesell rooms and video cameras with the aim of analyzing the behavior of people with the different home appliances to study them in their 'normal' use context.

Conforming to Ruyter (2003), Philips also insisted on building an advanced laboratory for project studies in a real context, which in 2002 gave birth to HomeLab, a real house inside a laboratory used to study and understand user's behavior in relation to domestic products. It was inspired by previous works of Philips Design including "Visions of the Future" (1995) and "La casa Prossima Futura" (1999).

Later on, thanks to a series of collaborations with MIT in which advanced research on usability was conducted, Professor Bill Mitchel from the Media Lab coined the term

" Living Lab" in 2005 (having previously created the PlaceLab MIT in 2004), to refer to a more open version of these laboratories ruled by the following characteristics:

a. They involve users from the beginning of the innovation process experimenting in real-world environments.

b. They are usually funded and financed by public institutions and, are located in public buildings; but also by private institutions. In the second case, Capdevila (2013) states that they are spaces that are not organized or dependent on communities or organized companies, but corporations do, indeed, create many living laboratories.

c. Their main objective is to innovate by analyzing the needs of the individuals in their real and closed environments.

There are different approaches to living labs. The users can work under methodologies of previously designed tests, or they just use their intuition, and that is how they become co-evaluators or co-creators of the process.

Even though the concept of living labs comes from MIT, corporate versions and other types of living labs have often been part of the research and development of innovation. Eriksson, Niitamo, and Kulkki (2005) identified several European models of Living Labs.

The idea, which proposes to gather interdisciplinary experts to develop tests in spaces from real life or "living environments" with the aim of exploring, experimenting, and evaluating innovative ideas, is also used in private and closed circuits. This can be seen in the case of NASA, where they look to investigate new ways to cultivate and take life outside of Earth.

Other models of living labs use communities of users to evaluate the global performance of a product or service through every stage of its life cycle.

These spaces can represent a crucial element in the ecosystem of the innovation of cities and are considered as a bridge between an individual's creativity and the companies' innovation (Capdevila, 2013).

5.9.5. Social innovation centers / labs

2013/2,266 m²/Good Food Matters in London, UK by Geraghty Taylor Architects

They are platforms to cope with complex social challenges, according to Hassan (2014) we need social laboratories to solve our most significant and most pressing social challenges created in the past twenty years.

Hundreds of people around the world are creating social laboratories, and many of them focus on answering questions related to the eradication of poverty, water sustainability, government, climate, social innovation itself, etc.

We may say that the natural space for social laboratories is "the street" and "the field" is where most experiments take place.

Therefore, the people who run these laboratories are a new kind of innovator. They are not necessarily scientists, academics, activists, or entrepreneurs, but a mixture of all those things, which have the following essential characteristics (Hassan, 2014):

a. They are social. They gather different participants from different sectors (government, community, civic society, experts, etc.) to work in a team.

b. They are experimental. Often the conclusions of their experiments result in prototypes.

c. They are systemic. They look for ideas to be developed in terms of prototypes

that have a repeated and scalable systemic implementation.

Found spaces vary from community food centers where farms, rooms and spaces converge to create sustainable projects interacting with local businesses, to classrooms, community centers, public or private buildings that make available some of their areas for this kind of initiative to gain strength and support social sectors.

5.10. Incubators

2011/250 m² /Incubadora Social ITESM-BANCOMER in León, Guanajuato, Mexico by Shine Architecture
2012/11,500 m² /BioPartner in Leiden, The Netherlands by JHK Architecten 2014/3,657 m²/Sprint Accelerator in Kansas City, MO, USA by RMTA
2015/450 m² /Centro Internacional Santander Emprendimiento in Santander, Cantabria, Spain by Angel Blanco + Jacobo Gomis

They are spaces where companies can be helped to grow and develop from an initial stage. Whereas the accelerators usually gather projects in more advanced stages where the business owners already have experience and look to increase the momentum of the company's development through an intensive program.

For purposes of this classification, I have considered the accelerators as an evolutionary phase of the incubators, since in my studies of the spaces both types are similar and, from the process point of view, it is more likely that the innovation is generated in the state of incubation, while acceleration seeks to improve the performance of an innovation.

Places that count include those with personnel, support equipment, infrastructure and funding available for entrepreneurs, or those being incubated with the purpose of boosting new ventures that seek to improve their growth perspectives.

These offices and workspaces are dedicated, promoted, and sheltered by institutions to support new commercial ventures that also have common facilities provided by the institution incubating it.

The Incubation space has varied formats and characteristics. It is usually located inside buildings, technological centers, and institutions that support ventures.

Their objective is to provide groups of entrepreneurial ventures or start-ups with workspaces for limited amounts of time, because they are expected to relocate to industrial districts or their own facilities as they grow.

They offer their entrepreneurs the possibility of being assessed by gurus or mentors that orientate them through different stages of the process. These gurus or mentors usually have their consulting firms in the vicinity.

Typically, the organizations that support incubation processes are sustained by public-private alliances such as universities, companies, and non-profit organizations interested in promoting the industry and the development of projects that include social models, sustainable projects, and new technologies.

The job of accelerators and incubators has favored the origin of renowned businesses on a global scale. Some, like the one at Harvard, become an I-Lab, others draw inspiration from Maker spaces, and others are structured as traditional spaces where their experts and methodologies are what adds value to the ones being incubated.

A strong association exists between entrepreneurial activity through innovation and the initiatives that include the development of technology through programs of incubators and accelerators (Autio, Kenney, Mustar, Siegel, and Wright., 2014). However, it is true that in some cases the design of the spaces is very basic and sometimes they do not even come with a war room or conference room (Knapp, 2014); these formats play a crucial

role in promoting and developing products and innovative businesses.

Some are hosted in innovation districts, which are considered base companies that promote the creation of new companies (Katz and Wagner, 2014).

To conclude, these incubator models are experiencing a resurgence, because the corporate scene of DIY makers group which is blooming in informatics and products; Where hackerspaces seem to turn themselves into incubators that allow experimenting with fabrication models with a business spirit according to Lindtner, Hertz, and Dourish (2014).

Even well-known design and innovation consultants such as IDEO Chicago offer a part of their spaces as innovation business incubators, putting themselves out as hosts and giving up part of their facilities for entrepreneurs to take advantage of their experience and physical and human resources.

Within these typologies I have identified and reclassified:

5.10.1. Academic nests

1990/11,500 m²/The Martin Trust Center for MIT Entrepreneurship, probably the most prolific incubation space to date in Cambridge BO USA by MIT

I have coined this term to define the incubation space supported by academic institutions that act as the providers of all initial conditions so that young graduates can advance their entrepreneurial projects under the protection, guidance and initial care of their educational institution.

Some incubators take advantage of private capital, institutional know- how and alliances with academic organizations to promote young students' projects, acting as mediators in their start-up stage.

One example is The Martin Trust Center for MIT Entrepreneurship.

This technological entrepreneur center, created in 1990, is located in Cambridge. On its own, it has been responsible for the creation of more than 30,000 active companies led by MIT students that give employment to more than 4.6 million people and annually generates an influx of almost $2 trillion; (this would make it equivalent to the 11th strongest economy of the planet in terms of sales). They produce more patent applications than any other university in the world (Roberts, Murray, and Kim, 2015).

As a part of MIT, it bases its principles in collaborative work with other departments, laboratories, and groups connected to the school's students.

Experimentation is a pillar of this process, and the center bases its activities' success on operating a hybrid model that fuses academic perspectives with real practices.

However, what is most impressive in the model is that it just acts as an intermediary. In this sense, neither the faculty center, nor the personnel that works in it, profits from the results of the new companies that they assist and its only apparent objective are to guarantee the success of MIT students' businesses in the long-term.

5.10.2. Innovation laboratories I-Lab

2014/2,576 m²/Kashiwa-no-ha Open Innovation Lab in Kashiwa, Chiba, Japan, Modena, Italy by Naruse Inokuma

2011/23,042 m²/Harvard Innovation Lab (HI) in Allston, MA, USA by Harvard Business School

"Innovation Labs create global interoperability. They are physical spaces that allow for collaboration among private sector, academia, and civil society" (UNICEF, 2012, p. 1).

Originally UNICEF conceived them as "an space and set of protocols for engaging young people, technologists, the private sector, and civil society in problem-solving" (2012, p. 14).

Although it receives its name and is recognized as a laboratory, this space is reliably considered more a place of incubation than an environment for research and tests, due to the different approaches space could have (social, commercial, scientific, etc.).

One of their main characteristics is that several partners intervene in their operation, development, and execution, such as the government, the academia, ONG's, and the private sector.

For this reason, the I-Lab has evolved its concept from a room or a social project to a real factory committed to the development of idea projects to be launched into the market.

Its facilities include I-showers, workshop, offices, meeting rooms, prototyping rooms, auditoriums, co-working spaces, leisure areas, and coffee shops, among many others. Thus, to be considered an I-Lab, many of the spaces and elements must be incorporated.

The project models that can be developed range from entertainment laboratories to products, business, and service development.

The laboratory is conceived to allow everything from brainstorming sessions to prototyping workshops, and they can be adapted as meeting rooms.

The main objective of an I-Lab comes from the intention to have entrepreneurs, business people, innovators, academics, and different kinds of actors meeting in shared spaces to develop and prototype projects, to put the best ones into practice.

According to Lewis and Moultrie (2005), an I-Lab includes structural and infrastructural specific content.

As an environment of physical research, it is active in the conduction of determined kinds of experiments related to the organization's applications.

Besides this functionality, I-Labs are based on the recognition that architecture, décor, design, illumination, etc. have a tremendous and decisive influence on the participants' behavior, as they try to stimulate the whole group's creativity, inviting them to eliminate physical manifestations of traditional conducts and hierarchy.

The I-Labs show greater complexity in terms of structure compared to the I-rooms; they are usually presented as an ecosystem, where different SFIs converge in a single place.

The space itself is conceived as a large building or area that allows the meeting of innovators, the incubation of their projects, training and knowledge. For this reason, they can also be classified within the category of incubation spaces.

5.10.3. Corporate Innovation clusters

2015/407.54 m² /COCREA/in Hitachi, Ibaraki Prefecture, Japan, MO by Bews and Building Environment Workshop

I define this incubation space as places destined to encourage teams from different companies to work in close collaboration under a cooperative model for a fixed period to find collective solutions that benefit their innovation projects.

Often, these spaces are set aside for collaborative work between groups created by companies and research organizations that operate in a particular sector or region.

Their objective is to stimulate innovative activity through interaction, knowledge exchange, and shared use of resources and experiences. This contributes effectively to the transference of technologies, information, and knowledge among the participants.

They tend to be grouped in offices, research centers, and many other co-working spaces, where they share activities in places that mix the different universes of the members who

inhabit them.

A characteristic of most of the companies that work the cluster model is that there may be direct competitors within them, which is why they tend to meet in two kinds of spaces:

a. Virtual: Internet, chat sessions, etc.

b. Physical: Meeting rooms, workspaces or desks that adopt different configurations and are generally aligned to the model of from how people work proposed by the research team at Steelcase (2015) early mentioned in this research.

In places where there are big knowledge exchanges between clusters, it becomes potentially harder to protect ideas from local competitors (Porter and Stern, 2001). Also, it is noted that the degree of contact between the change agents in clusters is highly related to their innovation level (Rogers, 2010).

Cosgrave, Arbuthnotb, and Tryfonasb (2013) argue that the collaboration of universities with industry experts and the production of business graduates is a key factor for innovation within these clusters and they are considered fundamental in the innovation process.

5.10.4. Co-working spaces

1999/45,720 m²/Cambridge Collaborative Innovation Center the largest co-working space worldwide—CIC in MA, USA by Timothy Rowe y Andrew Olmsted

The LSCI are Incubation workspaces based on the collaboration philosophy, and where the principle of sharing is a fundamental determinant of its architecture.

It seems as if San Francisco and Silicon Valley have become great examples in the

creation of SFIs, and this is the case of co-working spaces.

In 2005, the first co-working space was created, conceived of by a young open code software developer by the name of Brand Neuberg, who coined the term when he started his first venture. It consisted of a Loft workspace named, "Hat Factory." During the day, he used to give access to other technology enthusiasts so they could go to work there.

Researchers such as Capdevila (2013) have identified and classified these spaces and named them as LSCI, or, local spaces of collaborative innovation; dividing them into open Business co-working spaces, Living Labs, FabLabs, Makerspaces, Hackerspaces, and more.

Leforestier (2009) argues that business incubators could buy co-working spaces because they tend to be managed by governmental or non-profit groups, and they are focused on developing new companies and creating local employment. However, she indicates that this incubation model does not necessarily fit in the co-working space because business incubators are not centered in the collaborative and informal aspect, they are centered on an individual aspect.

This co-working space trend is going through an important expansion moment because many "Millenials" use them as their favorite model, because it offers the flexibility of working and doing business in spaces other than their garages, offices, and homes.

They usually have a Loft style and within them there is a great number of workspaces, some first come, first use and other designated ones, built with desks, chairs, and designated Internet connections, collective kitchens, lockers and in some cases, shared conference areas or meeting rooms that can be reserved; as well as shared facilities such as copying machines, package receptions, etc.

All of this is available for a monthly fee that is divided among the number of users and represents a benefit in terms of price, contacts, and relationships; providing a more professional alternative to working from home.

They are also distinguished for frequently having networking activities, as a way to broadcast the talent and capacities of their fixed or temporary inhabitants, where most of them work under a membership concept.

After having considered the differences in characteristics and types of Co-working spaces that exists today, I have identified and propose the following names and classifications, which are the most appropriate regarding their current orientation:

a. Social Oriented
2012/3,344 m²/The Centre for Social Innovation in downtown Toronto, CA

Spaces where social vocation has precedence over commercial intent.

According to their vocation, I considered it essential to separate these spaces into two principal approaches:

— Authentic Co-work: Co-working spaces based on the principles that gave rise to the co-working space trend, in which every member is a co-owner of the place and its services, thus looking for mutual support and shared growth, working under a sort of cooperative model.

This kind of space is found at the origin of the co-working model. Nowadays they stay mainly underground; consequently, they are hard to track or identify at first, because most of those who were born under this model has migrated to a business orientation.

— Co-working Causes: like The Centre for Social Innovation in downtown Toronto, CA which are Co-working spaces with an emphasis on social causes that support that kind of projects, where supporting and hosting companies work under social innovation criteria.

b. Capital-oriented

2013/1114.8 m²/WORKBAR in Cambridge, MA USA by Analogue Studio 2015/600 m²/Jingyuan No.22 Transformation in Beijing, China, by C+ Architects

Updated and energized c o - w o r k i n g spaces that have been transformed into businesses based on their original social, vocational spirit.

Within this category, I proposed four new orientations to be considered:

— Tech hubs: Like the Google Campus in London, England by Jump Studios or the space X in Amsterdam the Netherlands by Google, Ambro Matthew Lloyd Architects

They are known as co-working spaces in which high-tech business people can gather to work, exchange, and learn. These spaces can be launched by states and regular people and consist of physical and virtual spaces that try for new technology companies to work faster, thus increasing their success possibilities.

According to Group (2016), these spaces share a flowing and relaxed environment where people and business can mingle with angel investors and first-level trainers to boost their business model

The idea is to work with partners, providing office spaces and event venues by running mentoring programs with the intention of encouraging participants to share their experience and knowledge.

These space models are dedicated almost exclusively to technological entrepreneurs.

— Business Drive: They are now the most widely used model of co-working spaces and are considered the 2.0 version of the original typology.

Today they have become lucrative real estate businesses where the owners can be some of the creators of the original spaces or independent investors that started the original social oriented spaces.

Now, these spaces are reconstituting themselves into trustworthy brands, and even though the social concept prevails, they act with an additional drive to generate income for their owners.

These spaces have also suffered a major level of professionalization, because they have established stable alliances with venture capital industries, universities, and private institutions that expand the spectrum on which guests can count, adding more robust services than the average human and technological equipment.

— Open business: In this category, I can consider other co-working spaces of institutions created under the principles of co-working and how to maintain a social principle of sharing and working in an environment of open innovation that is owned by corporations, which seek to infect their employees with the environment and philosophy of collaborative working.

— Pop-ups: I have identified these co-working spaces like the space FABWORKS located in 75 E 4th Street, New York, USA by Miles

Storefront, like those that appear and disappear rapidly, because they are used for short periods of time to create prototypes, experiment, collaborate, and test new ideas using real estate spaces.

They are usually sub-occupied commercial spaces in galleries, lofts, etc. but can also be company spaces or offices that are for rent seasonally. They intend to diversify the use of commercial real estate spaces in cities, connecting those who have spaces with individuals, start-ups and public and/or private entities to help them foster their projects.

They can be spaces inside coffee shops, department stores, storefronts, showcases, etc. in which the activity taking place determines the pop-up concept. They can rise and disappear in a limited time.

They have a social or economic orientation and are spaces defined by their brief and temporary character; thus, maintaining the idea of promoting collaboration between the different members of their community.

5.10.5. Spaces DIY

2014/6,038 m²/The Columbus Idea Foundry, The Largest Makerspace on the Planet in Columbus, OH, USA by Alex Bandar

These co-working spaces are known as incubation spaces designed to favor, promote, and publicize self-learning as an ultimate end to develop innovative projects under a Maker philosophy.

The DIY (do it yourself) or “Maker” concept is based on the principle of completing tasks without the assistance of a paid expert.

In general, these DIY spaces are configured as Workshops that offer access to tools and

machines to experiment with technology and production processes. They are interested in the economic development of their local environment. In them it is possible to explore and construct everything from robots to different kinds of gadgets and technologies under the principle of collaboration and shared work.

A DIY space is the result of a combination of the proliferation of websites, hackerspaces, new financing models, physical spaces, new platforms, tools, and publications (Lindtner, Hertz, and Dourish, 2014).

Dale Dougherty is one of the greatest influencers of this movement. In addition to being known as one of the developers of the first commercial website or web 2.0, he created the Make magazine (2005), as well as the first Maker Fair event in San Francisco Bay in 2006, where he inspired a booming market of "Makers" that is still growing.

A collective of global enthusiasts, from which Dougherty stands out, supported the diffusion of the movement and they have inspired and built a large community of creators worldwide. Thanks to them, today it is easy to access on and offline spaces where you can learn to build everything from 3D printers and drones, to decorative objects made with adhesive tape.

These spaces can be classified as:

a. Hackerspaces

1995/700 m²/C-base in Berlin, Germany

2011/3,994 m²/the Geek Group in Grand Rapids, MI USA

They are DIY places where people share their interest in exploring with technology and then gathering to work on projects while learning from each other.

These spaces are defined as workplaces for communities that operate under the

hackers' ethical principles, encouraged by an open culture that bases their success on their ability to share and exchange their knowledge, and where every participant is treated equally.

The first wave of Hackerspace started in the 1990s and provided access only to a small selected group (Lindtner, Hertz, and Dourish, 2014). The second wave happened in Berlin with a more public profile and a strong commitment to freedom on the Internet.

The third wave of Hackerspaces arose in the San Francisco Bay area and committed to a global Hackerspace movement. We now live in a new wave based on the incubation of new companies and in the scope of research and development. (Lindtner, Hertz, and Dourish, 2014).

The last two go further than an amateur specialization. They are more specialized and dedicated. They seek to go further than the market of traditional enthusiasts and turn into generations of innovative spaces.

Regarding it, Lindtner, Hertz, and Dourish (2014) mentioned how a hackerspace in Shenzhen, projected at the heart of a former factory, led to the place becoming a space with Lofts, art boutiques, design studios, coffee shops, and bars.

They say Hackerspaces are crucial sites in this contemporary movement as physical spaces that provide social and technological resources for people to collaborate on the production of new technologies (p.441)

Also for them, a typical space is equipped with informatic tools that allow experimentation, such as laser cutters, leading-edge technologies, 3D printers, and open platforms of micro-controllers.

Hackerspaces are the LSCI that has shown the most growth, and most of their

websites are turning into showrooms for their members' projects (Capdevila, 2013).

In terms of research, the concept is fairly recent and has taken on an important dimension, as a trend that had already been established and that has been promoted by communities of collaborators in electronics such as Element14 (2009).

Among the main types of Hackerspaces, we find:

— Mad labs: According to Frances Bell and McLean (2014), they are non-profit Hackerspaces of communitarian character inspired by science, art, and technology, like the Manchester Digital Laboratory in Manchester, England

  Basically, they seek to attract artists, free thinkers, and creators who want to "do interesting things" under the concept of a social research laboratory and the autonomous development while exploring digital and technological media, searching for innovations, and connecting with scientific organizations.

  Their nickname is inspired by a social perspective center that stimulates creativity: The Manchester digital laboratory, which is financed by the British government.

  They are considered a hybrid space and a cultural organization that encapsulates a Hackerspace and vice versa. They host a series of innovative projects that in some cases come with external financing sources.

  Bell, Frances, Fletcher, Greenhill, Griffiths, and McLean (2014) define MadLab as a model of organizational Science Fiction prototyping that brings together visionary management, permeability to external organizations of different types, sensitivity to the local community.

In this space, the community can have access to the polymerase chain reaction (PCR) machines, gel boxes, 3D scanners, and other equipment.

— Dork bot: like the space Big Screen Plaza in New York, USA, by Dorkbot or the Willoughby and Baltic located in Boston Ma USA

They are Hackerspaces where events take place in which people do weird things with electricity.

These spaces were born in New York under the initiative of a professor at Columbia University, Douglas Repetto. In them, sound, image, and movement artists gather monthly with a community of enthusiasts, scientists, engineers, and designers to demonstrate creative uses of electricity.

Now, these meetings occur in more than 30 countries and on practically every continent.

Their free assistance and open-to-the-public format and their objective help in establishing connections and encouraging the collaboration between people.

In these spaces, one can see things including a demonstration of new software, an explanation of how to hack home appliances, dancing robots, or the presentation of a new piece of design created from commercial software.

Usually, these meetings happen the first Wednesday of each month and take place in unexpected urban places.

Each session lasts approximately two hours and includes three presentations. They are distinctive for being informal, fun chats of no more than 30 minutes, including questions. The standard narrative would not work very well, and the idea is to

sustain a friendly conversation.

Regularly, the space is adapted with a laptop, a wireless connection, a small mixing table and speakers (Repetto, 2000).

b. Maker spaces

2014/139.3 m²/PCC MakerSpace in Sylvania, Portland, the USA, by Portland Community College

These spaces are defined as DIY spaces to do things that are not necessarily related to electronics or technology, but take advantage of them to build, share, and spread the results in the community.

Maker spaces tend to be confused with Hackerspaces and FabLabs because they are DIY spaces where people gather to create, invent, and learn, leaning on the technology that the spaces offer.

These spaces were born from the hacker movement. They received the name in an attempt to change the negative sense that has been given to the word "hacker," so many of them became known as Makers.

However, even though they have very close likenesses and could be defined in the same way if analyzed, there is a difference between Maker and hackerspaces.

Hackerspaces congregate communities more interested in subjects related to robotics, electronic technology, and the like; while Maker spaces are more universal and can have participation from artists, traditional artisans, or creators who are not necessarily associated with electronics.

In other words, hackerspaces are the parents of the Maker and have a strong

orientation toward electronics, software, and robotics. Meanwhile, makers, as offspring, evolved by taking traditional technologies and new technologies like fast prototyping, 3D printers, as well as the development of software, tools, and different construction materials to create projects in areas that cover many additional fields, but do not exclude the hacker territory.

Makers have made it much easier to create and keep communal work styles[28], and develop communal projects as a new and efficient way of working. Particularly in the year 2014, several initiatives were created, and the makers' community witnessed an important growth for their use, size, and capability.

Among the main types of Maker spaces, we find:

— Maker Fairs: like the 3,000 m² of the Maker Fair Rome in Rome, Italy by UDOO 2015 or the 6,000 m² of the Maker Fair Paris in France by Make Magazine

  This Maker spaces were born as an event led by the directors of Make Magazine to celebrate arts, crafts, engineering, science projects, and the do-it-yourself (DIY) mentality.

  It quickly turned into a Maker space that host festivals where the enthusiasts of technology, academia, engineers, art enthusiasts, students, and people of all ages. People who consider themselves "creators," go to reveal and share their creations, making projects and ideas that are not found everyday visible according to D. Dougherty (2005).

  Their first event happened on April 22, 2006, at the San Mateo County Event

[28] Regarding the spirit of the maker movement, Von Hippel (2010) reminds us that if we open up, collaborate, and create teams, it is possible to change the world.

Center. In two subsequent fairs, they achieved the assistance of more than 215,000 people; rapidly generating a trend that extended from Detroit to New York and then to Tokyo, Rome, and England in 2009, and on to Germany and Canada in 2013, and recently to Hong Kong and Shenzhen.

Their primary objective is to look to the future, showing the makers new ways to explore the technologies under the philosophy of learning and sharing what they have created

— FabLabs: These places are considered Maker spaces to play, create, guide and invent, their main characteristic being that they exist around a community of students, professors, researchers who are virtually and physically connected, sharing tools and standard processes.

The concept was initially developed by the interdisciplinary center at MIT for Bits and Atoms and was designed for academic communities to develop prototypes for local companies.

Currently, more than 30 countries have Fab-Lab's, mainly promoted by universities that seek to encourage students to use new technological tools to create quick prototypes such as 3D printers, laser cutters, and programmable machines that allow production on a small scale.

Some examples are the 2 ÉchoFab Montreal, located in Quebec, Canada, The 300 m^2 of the Fab Lab IED Madrid in Spain by IED Madrid and the 350 m^2 of the Wanger family FabLab at MadaTech in Israel by MadaTech Museum.

Among the tools that most compose a Fab-Lab, we can find laser cutters, high definition NEC milling machine, routers for the construction of wood furniture

and electronic components, 3D printers, 3D scanners, CNC milling, Circuit Production, Shopbot, Laser Cutting/Engraving, Precision Milling, Vinyl Plotter, etc., as well as low-cost programming tools and high-speed microcontrollers for quick prototyping. This covers nearly everything from design and fabrication to control tests, analysis, and documentation.

The model is based on learning from mentors and students who, instead of depending on a fixed curriculum, explore working on solutions for real problems.

One of its most outstanding points is that this format of collaborative innovation allows new technological development from the members of the university to be discovered or move forward, and they communicate it through the Fab-Lab network so it can be applied worldwide.

For Taylor, Bakhtiar, Lyon, Gorton, Gershenfeld, and McEnnis. (2002), it is also very natural for each Fab-Lab to evolve independently to satisfy the unique needs of the communities that use the tools and resources in it.

For Capdevila (2013), Fab-Labs serve a broad spectrum of users as a place where they can begin and look for professional development, applied research, and promote research services.

The difference with a traditional Maker space is that these are supported continuously and fed by a university as we see at MIT, which also makes them a fortunate space and more specialized academic initiative.

5.11. Open Social and cultural spaces (OSCI)

2014 / 3,657 M²/District Hall Public Innovation center, a coffee hall projected to be the heart of Boston's Innovation District located in Massachusetts USA by Hacin + Associates

These are cultural or social spaces mainly open to the public that promote informal encounters, expositions, and opportunities to encourage the diffusion of innovations in the corporate or academic field. They could be galleries, restaurants, coffee shops, fairs, or museums focused on promoting innovation.

These spaces are part of the innovation ecosystem, constituting unique and distinctive formats where borders are not very defined, but the results of the encounters favor the "bump rate" (O'Donnell, 2012) or Medici effect (Johansson, 2004) necessary to promote innovation.

Among the main types of spaces of OSCI, we find:

5.11.1. Innovation civic halls

2014 / 3657 M²/District Hall, Boston's Public Innovation center USA by Hacin + Associates

According to Wagner and Watch (2017, p. 4), this is "A new type of dedicated civic space for the innovation community to gather and exchange ideas. Includes open-work and teaching spaces, event space as well as flexible-use."

The most relevant typology I have identified in this category was: District Hall, Boston's Public Innovation center detailed in chapter 7 of this research.

5.11.2. Cultural innovation centers

2013/1524 M²/Bezos Center for Innovation in Seattle, USA, by Olson Kundig Architects

2012/12,270 M²/Museum of Medical History and Innovation in Boston, USA, by Leers Wondaful Associates

Spaces OSCI designed to showcase, host, promote, and connect innovative projects of cultural or social interest, as well as to generate connections and in which the main

f e a t u r e s is that they are not spaces conceived exclusively as places of art or science, but mix co-working, culture, and entertainment around innovations.

Even though these kinds of spaces are not commonly cataloged within the category of innovation workplaces, the new buildings and projects go further than the cultural profile, coming close to co-work and research.

Their characteristics are:

- They generate activities, encounters, exhibitions, coteries, and initiatives that connect a community of innovators with each other, aiming to produce new innovations.

- They promote models of co-working or hybrids.

- They are conceived as spaces to promote, spread, and link a community with the aim of stimulating innovation.

- Their spaces must stimulate meetings and planned activities of mixed character with public access and general interest.

In this category highlights the Bezos Center for Innovation, as an exhibition space dedicated exclusively to innovation, in which interactive projects, multimedia, artifacts, images, and stories are presented, as well as practical experiences of Seattle.

The interactive exhibition begins with the question: “What is innovation?” and their participants can publish innovation challenges for future visitors to respond to through drawings, charts or comments.

The visitors can also identify problems related to the city. They have a tree that shows the

history of innovation in the region, highlighting the “made in Seattle” concept. The museum’s facilities have activities such as innovation platforms, and idea launching, among others. (Archdaily 2014)

The interactivity is important to the exhibit and the visitors can see throughout how ideas left by people evolve. They also learn to identify the common features of successful innovators and what things have a positive result in an innovation.

5.11.3. Camps and events

2013/173,728 m²/CES international consumer electronics show in Las Vegas, Nevada, USA 2014/1272 m²/SUP46 Start-up Weekend Stockholm, Sweden

These OSCI spaces are devoted to hosting planned occasions of social, public character where work is exhibited, a particular ability demonstrated, or innovative ideas are presented and exchanged.

Innovation fairs, weeks, summits, and similar fit into this category.

Some examples of the most established spaces that have promoted innovation and that are even carried out under Hacker and Maker principles are:

The International consumer electronics show in Las Vegas: Takes place in January and has become the meeting point by excellence for projects, businesses, conferences, connections, and reunions of projects related to consumer technology, out of this world technologies and the most distinguished innovations of the year.

Start-up weekend: They are events during which groups of innovators, business people, artists, marketing people, and others have 54 hours to prototype and formulate ideas with the purpose of presenting their projects on Sunday afternoon, and throughout the process

have the chance to meet their future co-founder, friend, mentor, or investor. (Feld 2012)

Bar camps: Under the Maker philosophy, these conference events are defined as non-conferences with speakers who are not speakers. They were born in opposition to the "Invite only" conferences organized by the technology editor Tim O'Neill in Silicon Valley in 2005. (Barcamp 2008)

This model has been widely replicated, producing an opportunity to create an international network of conferences generated by users that work in Participative Workshops and workshop-events given by the participants. This space model has been introduced to other scenarios and is now used in fields from software programming to real estate.

5.11.4. Coffee Shops

2008 / 212.98 M²/ Starbucks Coffee in Dazaifu, Prefectura de Fukuoka, Japan / Kengo Kuma & Associates

Places of business where coffee and hot beverages are served along with light snacks, they act as OSCI, promoting co-working and the integration of innovators.

Researchers propose that coffee is a common space in itself, and it has been during my visits and observations, as well as through interviews with different space managers that the absence or presence of the beverage has been perceived as a dominant element of each places' interaction.

That is why coffee deserves a particular spot in this research. It has frequently been associated with the rise of the Enlightenment because it favored the encounter of intellectuals and artists.

To Johnson (2010), before the rise of the term "coffee shop" in 1965, the British found in alcohol a healthy reason to gather, because their water was not as potable as it is now

and alcohol was considered a healthy choice. Therefore, it was common to drink alcohol with every meal, and people would meet to consume alcoholic beverages all day.

He states that with the advent of a stimulating drink like coffee, the consumption of alcohol, a depressor by excellence, decreased. Consequently, it allowed people to be more alert, sharp, and to have better ideas. Thus it was no accident that "the blossoming of innovation in England came from the shift from beer to coffee and the tea habit" (Johnson, 2010)

Like that, coffee shop turned into the space in which "people from different origins, fields of experience and action would gather." Most likely, "a great number of innovations from this period has a coffee as part of its history" (Johnson, 2010).

Nowadays, coffee shops are blooming around the world and are considered meeting places by excellence, in which ideas and processes flows naturally and informally.

A significant part of this resurgence is due to the overcrowding of this product's points of purchase, Internet diffusion, and the change in mentality and working culture.

In this way, new encounters are generated, and new Medici effects allow us to combine a stimulating beverage with an open space, and with free Internet access, the possibilities to connect physically and virtually with other people become infinite.

There is one company that has mainly defined the international standard of these spaces and it deserves special attention. From their headquarters in Seattle to a corner in Harvard, it makes their spaces turn into a meeting point by excellence.

Starbucks first location opened in Seattle's famous Pike Place Market in 1971.
From its creation inspired by the novel Moby Dick and the mining tradition of the first coffee dealers to today, it makes every effort to propose an uncountable number of ways

to keep loyalty and propagate coffee consumption. (Schultz 2011)

It seeks to become the third place between home and work, emulating the Italian coffee bars and promoting the way in which it turns into an experience, promoting a sense of community and reunion.

The company has incorporated many innovations to maintain their loyal clients. This includes becoming the first private company in the U.S. to offer a program of stock options over actions that include their employees, to being the first to offer free and limited Wi-Fi access at their points of purchase through the creation of their own digital network. (Starbucks 2015)

They have installed wireless power outlets for cellphones in association with Duracell Powermat. They have introduced new flavors that continuously seek to take the brand further and do the same by adding new food options and even selling alcoholic beverages while acknowledging that they are not just a place for morning coffee.

They seduce their clients through new systems to order digitally through their app, as well as delivery service. They call their clients by their names and not by a number on a receipt.

They understand their market and the needs of specific clients who visit exotic boutique coffee shops, so they introduce an island to taste test premium coffee lines in locations carefully designed as exhibition theatres where clients can see and learn about the most exotic beans.

They joined forces with Spotify and Apple Music to set their spaces' atmosphere and give their client options. They create stores inside trains and develop mobile trucks for universities' campuses.

Lastly, they create online communities like "MyRewards Idea," where through crowd-

sourcing models, they gather comments and suggestions from clients that they then implement in their stores.

Defined in one phrase, these places know how to put the coffee where you are!

5.12. Innovator's habitats

2005/6,100 m²/Xanadu 2.0 Bill Gates's house the Modern House of one of the wealthiest innovators on the planet located in Medina, Washington, USA, by Peter Bohlin

I have identified these spaces as those environments where innovators live.

Within the research, I have noticed that less attention has been devoted to Innovator's habitats. They are important because they are often considered workspaces.

These places turn into spaces where their ideas flow and develop, where they have face-to-face or virtual meetings with colleagues or even close essential deals. Therefore, it is vital to approach them within the SFI.

For this reason, I deem it pertinent to identify them and propose a classification that is in accordance with the main characteristics of such habitats.

Regarding their function, style, and design, I have identified and suggest the following typologies:

5.12.1. Co-creative housing projects

2012/34 - 92 m²/Factory 63 in Boston Ma USA by Gerding Edlen

2016/13,750 m²/Lassonde Studios in the University of Utah, Salt Lake City, USA, by EDA Architects, Yazdani Studio and Arup

This Innovator's habitats are Co-creative projects specifically thought to host innovative

communities. These environments of Lofts and Micro Lofts are also known as Innovation units or micro- apartments. Some are technological spaces that mix co-working concepts with students, artists, and entrepreneur rooms.

For example, Nicole Fichera[29] mentions that Boston's Innovation District is leading the Factory 63 project, seeking to create context for innovators. It is focusing in three main aspects (food, housing, and infrastructure) for businesses, looking to promote interaction and allowing people to connect through common areas and public spaces.

Therefore, this building with 38 studios of one or two bedrooms, includes twenty-three innovation units destined for technology fans.

Each 183-square-meter unit has been conceived as a highly functional micro-apartment located just a few blocks away from the city's financial district.

The project is divided into three major concepts: apartments to live and work in for artists, a rooftop lounge area, and a design and innovation gallery that has a permanent partnership with the Boston Design Museum, Greentown Labs and IDEO, among others.

The Gerding Edlen firm turned an old, six-story shoe factory built in 1908 into housing for innovators.

To this day, the place comes with parking spaces for bicycles, and a ground-level lobby filled with chairs, tables, and sofas for public use where you can drink free coffee.

As stated by Fichera, in these areas, "the manager does not act as a safety guard, it acts more like a community manager"[30] overseeing the co-working space, the meeting rooms,

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[29] (2014, September 24). *Interview with Nicole Fichera about the space of the District hall as General Manager at The Venture Cafe Foundation*, Boston.

[30] (2014, September 24). *Interview with Nicole Fichera about the space of the District hall as General*

and the art gallery, attending to meetings with business people and frequent activities focused on the creation of new companies.

Also, the residences for creative innovators have controlled access through electronics access gates.

Each apartment has a Loft concept with stainless steel finishing, wood floors, sloping ceilings, laundry facilities, an unobstructed view, high-performance windows, and apparent brick walls with wood details.

Finally, the project intends to be inclusive and is offered as a project that allows having a unit for approximately $2,299 a month, and is ruled by the principles of co-working and sustainable practices, seeking to build inspiring places, promote creativity, minimize its carbon footprint by using recycled materials, and a living Roof with a green terrace on the top floor.

Lastly, the project includes the creation of a pleasant pedestrian environment, searching to integrate schools and neighborhoods, preserving historical symbols with values that define the entrepreneur community and artists hosted.

5.12.2. Modern housing

2015/72–140 m²/Bakery living Pittsburgh apartments in Pittsburgh, PA, USA by Strata

2013/2980 m²/International Accommodation Center for the Oceanological Observatory in Banyuls-sur-Mer, France by Atelier Fernandez and Serres

High-end spaces with modern styles that are part of projects of urban revitalization projects, new projects, academic facilities, or innovative projects that are usually located

Manager at The Venture Cafe Foundation, Boston.

near the innovation poles of cities or districts, therefore turning them into their environment.

These spaces are characterized by, in general, having a high commercial value because they are located in areas of high influence and because they give value to the environment or become part of master corporate or university plans.

Renowned architecture firms usually develop them and try to give them unique and iconic looks in consonance with their lifestyle.

This kind of space has become more popular because they are in line with the purchasing power and entrepreneur motivation to make investments in real estate near their workplaces, or where they incubate their projects, with a high return on their investment.

Also, these habitats are promoted by innovation centers and university students who wish to offer to the scientific community alternatives that allow them to live surrounded by vibrant, modern environments with quality living spaces.

In some other occasions, urban developers present solutions for innovative entrepreneurs with the idea of attracting brilliant profiles, for example, the Bakery living Pittsburgh apartments

Within the projects led by Pittsburgh University, it is not rare to find a research laboratory in human engineering that innovates in prosthetic solutions or companies that solve projects to improve the medical technology benefits, as well as technology stores and maker laboratories equipped with leading technology.

Built in the historical Nabisco factory, Bakery Square was erected with a new development of mixed spaces in the East End area of Pittsburgh. It is promoted thanks to the new innovative developments that are defining the city, among them, different companies and robotics initiatives. (Walnut Capital 2015)

The project is just an example that illustrates the concept, in which they seek to make the tenants feel more welcomed than they might be in a traditional lobby. Instead, visitors should feel as if they are coming home.

A spacious lobby and living room welcome them, and there are a pool table and room to enjoy a good coffee after work, and bicycle paths that meander around a lively urban environment near Mellon Park, the Pittsburgh art center, and the business school, complete it.

The Loft style, three-bedroom apartments enjoy shared facilities, such as the pool area, BBQ, and are presented as an alternative preferential location within walking distance to their workplace.

5.12.3. Countryside habitats

1991/535.8 m²/Steve Jobs House in Palo Alto, Ca, USA 2011/521.8 m²/Mark Zuckerberg House in Palo Alto, Ca, USA

These Innovator's habitats are the homes of renowned innovators, which have chosen a calm, British countryside style in which their look does not allude to the magnates or high-tech entrepreneurs living in their interiors

Two examples of classic and relaxed styles are the Steve Jobs house in Palo Alto located in a quiet neighborhood which shows an English space, with an antique, relaxed, and classic look, contrasting with the eclectic style of the home office that is shown as chaotic, full of elements, bookshelves and a bit messy observed in Diana's Walkers' photography (2011).

On the other hand, James Dyson's house is a building with British and French influence in which Dyson rebuilt a house in an old industrial mill, and turned it into a magnificent mansion with enormous gardens that showcase an apparent contradiction between a modern

man and the traditional space he lives in. [31]

5.12.4. Pop Houses

2009/1000 m²/Henry Armand Smith in 38 upper Clapton Rd, London UK by snakeskin jacket limited (Singer 2009)

2004/46.4 m²/Room H33 in Harvard University Straus Hall Kirkland House by Mark Zuckerberg

The habitats (apartments and houses) of designers, artists, film directors, creative curators, students, and some tech gigs. They are characterized by the chaotic and pop interiors in which they frequently work.

They reflect pop culture with an anti-minimalistic approach where white spaces with clean lines do not exist. On the other hand, they are the exuberant maximalists of spaces, and are often filled with DIYs that reflect pop culture.

Gavin and Sewell (2009) mention that we can also find vintage styles and postmodern spaces with full shelves that reflect the creative process they live while in that place.

[31] This multimillionaire inventor owns about 101,171.080 m², much more than the Queen of England herself. The Telegraph. (2014, 28 December)

CHAPTER VI

SINGULAR SPACES FOR INNOVATION (SSFI)

Throughout this research, I have observed that different categories of SFIs exist.

These categories cover more complex environments, ranging from innovation districts, down to halls, rooms, and workshops, among others.

After having identified these various "types" of SFIs, I regrouped a part of them under the category "Singular Spaces for Innovation," because they are somewhat unique and less complex.

I then proceeded to identify their various features based on the descriptions provided by authors, observers and myself.

Subsequently, I set out to organize them appropriately regarding their function, conferring more clarity and precision to existing literature.

These can be defined as less complicated SFIs by their nature, but not necessarily by their design, and are typically contained within another SFI.

Among them, we can find SSFIs that range from intimate, closed environments, and auditoriums to open halls allowing social interaction, meetings and/or gatherings of innovators.

Within this category are spaces of reduced proportions, as well as elements that connect, compose, and intervene in their configuration in one way or another.

In this way, an appropriate classification for them would be the following:

6.1. Innovation rooms (I-rooms)

2015/1,858 m²/Standard Bank—Playroom Innovation Center in Rosebank Johannesburg South Africa
2012/182 m²/DuPont Innovation Center in Moscow, Russia by Arch group
2015/115 m²/I-lab Ibero, I-room for the IDIT Institute of Design and Technological Innovation in Puebla México by CD&I Associates

They are SSFI conformed by rooms, halls, and groups thereof that contain moderately complex spaces explicitly designed to bring a group of people to work collaboratively in an open way in the search for comprehension and development of projects and methodologies related to innovation.

Even though they are usually associated with Innovation Labs, the halls, innovation and creativity rooms, or I-rooms, have an element of complexity that is more reduced regarding scale, investment, and function.

They are considered unique spaces within buildings or corporate areas, academies, and institutions, which seek to stimulate the creativity and innovation of their participants.

On the other hand, they are considered more confined spaces that do not necessarily connected with workshops 7s, accelerators, and other facilities, and tend to act more as "lone wolves."

Their objectives can include functions such as learning to prototype an innovation project supported by dynamic and current tools in a place specially created for the organization's

needs until it becomes an area of formal and informal meetings that contribute to stimulating creativity. I-rooms seek to become a leverage tool for projects and knowledge that respond to more profound questions within the frame of innovation.

This space pretends to be inspiring, motivational, multitasking, fun, and different from the other rooms or areas of the organization that contains it. At the same time, it is designed to consider the philosophy and principles of the organization, so it is associated and projected regarding their values, brand identity, and frequently equipped in terms of their specific needs and the context of the organization that promotes it.

These halls are distinguished for being comfortable, friendly, modular, adaptable, interactive and more informal, because they intend for users to go outside the box and think differently, which is why the space, in this case, turns into a facilitator of context and ideas between people and initiatives with which they can be shared.

Therefore, boards, big pieces of paper, boxes of colored felt-tip pens, and a considerable amount of Post-it™ or the like come in handy in this place for discussion, per Wycoff and Lynn (1999).

Wycoff and Lynn (1999) suggest that collaboration spaces should meet concepts of beauty, fun, promote interaction, abundance, and visual thinking.

Since their approach is more linked to the creative stimulus, we can often find an I-room with ball pits, fun iconic elements, colorful walls that resemble a kindergarten space in search of activating the disinhibited and creative kid that every person has inside, and that wants to walk away from the traditional format of a very serious and stiff organization.

Primarily oriented toward collaborative work, they seek various visual and multi-sensorial stimuli to allow playful group sessions, having coffee, brainstorming, or

approaching focus groups, and others. Some I-rooms then evolve to become an I-Lab or integrate to one.

Sometimes, organizations can have more than one I-room, and they can be located in one sector that interconnects them or in different areas of the entity.

There are many types of these I-rooms and they have experienced exponential growth in the past few years. A great number of them have been funded under the Design Thinking principles and the idea of "research by design."

We can find typologies ranging from playful rooms with a youthful and recreational spirit that stimulate people's inner child, to ones filled with technology where their primary function is to accelerate the collaboration and creation of ideas. It is also common to see that in some of them, rituals are created to work or even to access to them.

6.2. Workshops

SSFI where a person or group of people interact with different technologies to construct, prototype, and/or develop innovative projects.

Usually, they are not conceived as the SSFI for production but for the purposes of creation.

These places contain work banks, machines, electric tools and other equipment that can include the latest instruments such as 3D printers and CNC machines, or similar, depending on their destined use.

Within SSFI, the workshop is a relevant protagonist, because they are considered micro-laboratories where ideas are cemented.

As rooms, they are closer and more confined places that provide functional services for innovators, hackers, and makers.

They have a wide variety of possibilities from workrooms for the construction of wood products to specialized workrooms for plastics, ceramics, 3D technology and audiovisual usability.

Among the different types of workshops, it is interesting to find a prominent typology related to SFIs:

6.2.1. Workshops 7S

They are SSFI in which innovators' ideas are fabricated, repaired, and produced, which are usually 7 seconds away from their work centers.

The concept under these prototyping workshops and tools is associated with Stanford's Design Thinking laboratories, where the main idea consists of getting the assistants to feel like children, surrounded by tools and materials where they can put their ideas into practice in seven seconds.

It is also suggested that prototype and tools Workshops be at a seven seconds average walking distance, which ensures that the user will go from the idea to a prototype in a fast and constant way, without losing momentum.

Some other authors like Stewart (2013) credit the fact that "Seven Seconds Decision-Making" is key to go from intuition to reason in an idea, and to make a business work.

The prototyping room is an area that can go from the most basic, composed by elements that can be reconfigured by hand to high technologies of fast prototyping and the latest

machinery (Doorley and Witthoft (2011).

6.3. Collaborative rooms

They are SSFI for co-working with other individuals that have the intention or objective to produce and/or create innovation.

In turn, I subdivided, these spaces as follows:

6.3.1. Meeting rooms

SSFI confined to sustain meetings in which the possibility of disruption is minimized, and in some cases, assume the dynamics of a classroom.

They are present in every SFI, formal meeting rooms usually have a table, communication elements, screens and video projectors, so that meetings can be held in a local and closed way, as well as remotely.

6.3.2. Brainstorming rooms

They are temporary SSFI that have the function of bringing people together to create something around a project.

Even though they have similarities with war rooms, since they are workspaces that allow work team meetings, their difference is that their purpose is merely temporary.

In these spaces, mind mapping and storyboarding takes place, as well as many kinds of experiences related to visual thinking.

They are characterized by having drawing walls, some with digital and interactive screens, video projectors, and tables with sheets of paper, as well as boards.

They are flexible spaces in which there usually is furniture similar to what we could find in a meeting room mixed with sofas, to adopt positions closer to a "lounge." An appropriate subdivision of these spaces is:

a. Project rooms/War rooms/Instant shared studios

They are SSFI dedicated to the development of a project and they are for small groups of people to gather and work collaboratively on a project.

It works like a small apartment for rent that is used at the discretion of the team that inhabits it until the project ends and gives way to a new tenant. Thus, project spaces turn more into temporary elements than permanent ones and they are configured regarding the requirements of the users (Doorley and Witthoft, 2011).

Project spaces can be temporary or permanent as reported by Hillen and Camacho (2015) Moreover, each project determines an exclusive closed space like an office or an open space of the Loft type.

For Knapp (2014), these project spaces can be associated with war rooms, since they are permanent or temporary rooms in which strategic decisions are made.

In turn, the war rooms are inspired by the spaces used during military or political campaigns and are considered spaces where it is common to have many things on the walls: charts, research notes, Post-it™, a sketch of possible solutions, scripts, etc.

They usually have whiteboards, drawing walls,momgothers.

They also have flexible furniture and some of them are set up as reconfigurable conference rooms with mobile reusable curtains and panels to locate reusable adhesive notes and prints.

b. Huddle rooms

SSFI that allows a convenient and temporal meeting of two to five people and are thought as places that stimulate team collaboration encounters.

They are small meeting rooms that have everything ready for them to be used for a moment and then leave them free for the next guest. Under the premise of "first c o m e , first served"

6.4. Gathering Spaces

SSFI that allow to meet, where the meetings can be scheduled or not (Doorley and Witthoft 2011).

In terms of the types of meetings that can be held in these spaces I have identified two main ones:

- Formal: Those planned and consequently scheduled.
- Informal: Those that happen spontaneously; they usually happen in spaces located in common areas.

Spaces for casual meetings play an essential role in the facilitation of face-to-face technical consultation. Within the URCS territory, they are perceived as friendly areas that offer amenities such as food and coffee, and in the case of university research centers,

they increase the possibilities of innovation (Toker, 2004).

Innovative organizations deliberately design these spaces (micro informal meeting spaces, sofas, coffee shops, hallways, kitchens, corners) to encourage the sparks of random encountersers, or the so-called bump rate mentioned by O'Donnell (2012).

In turn, I subdivided, and classified these spaces as follows:

6.4.1. Theatres, auditoriums, forums

They are SSFI and formal work meeting spaces where ideas are exposed and results are presented to a large group of community members.

They are equipped explicitly with voice amplification systems, and screens of retro projectors, among others.

Particularly in the diffusion of innovations, specific elements are created and accompanied by formats characterized to promote the encounters and innovation meetings, for example, the TED TALKS

This talks on technology, entertainment, and design (TED), begun in 1984, have gained international acclaim and are recognized as points of encounter for the innovation community.

The standard experience is an 18-minute-long talk given by experts before an audience. In them, the design of the receiving areas to the space where the talk occurs is coherent and makes sense to the commitment to innovation, as they are planned with the aim of promoting a unique style and identity.

As a historical partner and strategic ally of the event, Steelcase provides the space design and furniture for the lobbies and meeting areas, promoting the interaction of people in between talks.

This way, a network of places specifically designed to connect attendees based on their behaviors and creating everything from bookstores to coffee shops was imagined.

The design of the auditorium is adjusted to the patterns suggested by organizers, they also distributed lounge chairs and big screens, as well as stimulating spaces with boards and markers for the attendees to be able to join, meet, create and exchange ideas (Doorley and Witthoft, 2011).

This ranges from using the official logo, placing a round red carpet, hiding cables, laptops, and also placing an object on stage to imply the topic of the event.

Even the projection screen configuration is purposeful. It must have a 16:9 ratio—enough to show legible text to every attendant.

Other important points in the configuration of their spaces highlight advice to illuminate the logotype of the TEDx event, to lay out the seats in a way that everyone can see the screen, to hide speakers, and even to set up at least four video cameras with the angles and formats stipulated by TED.

6.4.2. Fun rooms

They are SSFI with games where creativity is encouraged through play.

It is normal to find these kinds of spaces in advertising or creative agencies,

delimited or semi delimited, which are inhabited by a small football table, pool tables, dart boards, etc.

In the technological enterprise era, these spaces have become more prevalent, for they promote a relaxed and dynamic atmosphere and offer employees a fun perspective in their workplace, including Ping-Pong tables, arcade games, among others.

6.4.3. Kitchens

SSFI where food is prepared, cooked, and kept. It is considered a point of informal meetings and information exchange, since it also gives the possibility of entertainment, making individuals feel at home.

These spaces have been mentioned as places where innovative methodologies are applied, where people gather to work in food-related sessions, like the traditional breakfasts in the Design Factory of Aalto.

Kitchens promote the convergence of people around these spaces, which is highly desirable and positive. As N a o m i Berlin says, " in the CIC every floor had a kitchen and a room for entertainment and relaxation to bring together the innovators" [32].

6.4.4. Living and family rooms or journal lounges

They are SSFI of casual meetings dedicated to the informal meetings without a previous schedule. They are like the living room in a house, where users can amuse themselves

[32] (2014, September 30) *interview with Naomi Berlin about the space of the CIC as e Relationship Manager of the CIC.* Boston

watching a show, reading a magazine, and the only intention is to make the environment more relaxed and casual.

These places seek to present more relaxed and informal face-to-face meetings.

They are used as counterpoints to meeting rooms and can have small refrigerators and coffee machines or vending machines that allow the space to be a place of casual encounters, but at the same time facilitate informal interaction.
They can be equipped with low chairs, tables, and a sofa, individual finger foods, professional magazines, even a kitchen, coffee makers, and a board.

According to Toker (2004), this kind of spaces quickly became the favorite places to make coincidental consultations in the laboratory spaces of universities

6.4.5. Cup rooms

I use this name to define places that contains a machine or vending system of coffee, chocolate, water or tea which can be found in an independent room or integrated into a kitchen, family room, or lobby.

Coffee and coffee shops are often inside the spaces mentioned by different users[33] as places that favor innovation, but this definition also involves spaces or small rooms where you can go to have a cup of something hot or cold and engage in casual conversation.

Some of them are equipped with snacks, napkins, disposable cups, and are identified as casual spaces within the organizations.

Recently, the process of locating this kind of spaces in organizations has been so important

[33] "Innovation is Coffee" (HIL, 2012, sec 41)

that when in 2014 Mars drinks[34] inaugurated the Mars Drinks Campus, Investing US $29 million in a space designed by the architectural firm JacobsWyper Architects in West Chester USA they hired Herman Miller's design team to work around the concept.

Herman Miller's team was in charge of the interior design of their offices because, being a company devoted to providing coffee for the different spaces in the world, they wanted to know: how could they help to promote encounters within their organization and keep an open culture of participation or collaboration? Under the principles of a family company that encourages openness and accessibility at every level.

They analyzed and documented the way in which employees (associates) meet and work throughout the day, paying particular attention to what happens when they collaborate and how, where and for what purpose they do it.

As a result, they proposed a design that encouraged real human contact, where instead of sending an email to a colleague, the person would dare to give the message in person.

According to the design team (Miller, 2014, para. 15), The answer was in the concept of seating with the others through a cup of coffee, tea, or hot chocolate.

Since these play a critical role in behavior in the workplace, because it helps people to become involved, listen better, and to create connectivity and collaboration that encourage productivity.

6.4.6. Coffee bars

Areas for coffee, and snacks that encourage or induce empowerment and to promote collaboration. For Wycoff and Lynn (1999) they provide the concept of abundance in the space.

[34] One of the world's 10 largest food companies (Hess 2004)

6.5. Thresholds/transitions

The SSFI that defines change processes from one place or condition to another. These are transitional spaces such as corridors where there are changes in time, space, or state (Doorley and Witthoft, 2011). They could be subdivided as follows:

6.5.1. Touchdown spaces

SSFI plug-and-go spaces focused on activities for people to process and answer emails, test, social networks, and calls.

These spaces usually require a minimum of furniture because their concept is based on the idea that an individual can “touch ground” for a moment to achieve productivity.

Most users of these places have laptops or smartphones, and for them, it is vital to find a transitional space or area bounded by a virtual or real form where, for a moment, they can have a drink holder, electric outlets, and a comfortable illumination system to stay in for short periods of time.

Usually, they are configured with a chair and a connecting tower system. Depending on their configuration, they can also just consist of tall tables with easy access to connect a computer, thus offering a space with Wi-Fi connectivity.

6.5.2. Peanut galleries

SSFI proposed by Doorley and Witthoft (2011) where visitors can go in and observe the activities of a workshop, company, or process, without the need to interrupt those working in the space.

They Arise from the possibility that the projected space is so exciting that it attracts visitors who wish to see how it works.

This space serves as a window to the work underway in the area of innovation and allows outsiders to go and observe quietly.

6.5.3. Corridors and halls

SSFI conformed by long passageways in buildings that connect doors that lead to other rooms. They are also associated with open areas in buildings that directly affect the encounters between the investigators, creators, and innovators.

Also, it has been proven that spatial configuration and walking distances are strongly linked to non-programmed encounters in every URCS (Toker, 2004).

6.5.4. Dead-ends

This SSFI "cul de sac," as defined by Doorley and Witthoft (2011), has the objective to generate pause areas or spaces that don't have an apparent intention other than to promote casual encounters between the inhabitants of the place.

They are zones intentionally located at the entrance, exit, or general access in a concentration area to favor spontaneous reunions between the different members of the place for them to update each other in conversations, and about pending points or agreements.

6.6. Singular rooms

They are SSFI destined for the work (usually individual) of people that participate in

innovation projects. I have subdivided them into the following three categories:

6.6.1. Home bases

Doorley and Witthoft (2011) define them as spaces where individuals help each other in more permanent ways, from which they come and go. It is considered as the base space where they claim more permanence and even personalize and demonstrate their sense of belonging.

6.6.2. I-showers/takeoff spaces

They are SSFIs for a person looking to focus on the search for innovative solutions.

Even though they are similar to Zen spaces, the I-showers are not projected for relaxation and isolation, but as intimate creation spaces in which the user can find the same or reduced company with the intention of isolating them from the environment, so they can reflect and have new ideas.

According to Toker (2004), face-to-face consultations facilitate innovation but the need for privacy for concentrated work cannot be neglected and like the showers of a house, the users recognize them as closed and controlled environments smaller than a meeting room, but larger than a workplace.

These spaces do not favor horizontal positions. They stimulate upright postures.

They are not hidden spaces but are spaces in which the users disconnect from their environment.

In them, the idea is to work in a seated or standing position so ideas rain over your head with the purpose of forming or concluding ideas or looking for the Eureka Moments mentioned by Johansson (2004)

The characteristics of these spaces are that they are not only projected as leisure or Zen areas but as cozy enough for a person to be comfortable in an appropriate working position that promotes actions more than relaxation.

One of the examples of I-showers can be found in the I-room from Ibero University in Puebla, The I-LAB IDIT.

For this it was proposed that each can be configured as a separate cubicle with a sound system that could be connected to a mobile device (iPod, iPad) but at the same time could have an integrated sound insulation, as an acclimatized area and an oasis within the space, to facilitate the work within the busy laboratory area occupied by the IDIT.

6.6.3. The hiding places/Zen places

They are considered as simple rooms of isolation, or special places where the user can hide.

Even within SFIs, which emphasize the possibility of having open spaces, where everyone can interact, thus promoting open innovation, Stanford University research suggests there must also be spaces that are not removable, of low or no technology, small, hidden, somewhat dark, that smell good and require rituals to become part of them (Doorley and Witthoft, 2011).

6.7. Support elements

All those SSFI and temporary or permanent elements that support the development of activities collaborating in the ecosystem of SFIs.

Within this category, we can consider everything from the bathrooms to copy rooms, as well as prototyping workshops, because all of them have been thought of as support elements for the main activity of innovation.

Sometimes, architects and designers do not consider support elements as part of the space design. Therefore, they can be forgotten, overrated, or misrepresented in their designs.

The location of the equipment facilitates interactions and the location of informal common spaces facilitates matching queries as an addition to the common informal goods, because knowing other investigators are there attracts attention to consults, and therefore exchange (Toker, 2004).

According to Toker, the power of a printer and the use of conventional tools as support elements attract researchers. Thus, the perception of an informal environment, the awareness of other colleagues, the visual qualities, and the feeling of belonging, all have a positive influence over the user.

Support elements could be subdivided as follows:

6.7.1. Showrooms

SSFIs dedicated to the exhibition of projects related to innovation, a showcase of prototypes or dedicated rooms.

They have similar characteristics to libraries and banks, but they are different because their primary function is not to store projects, but to exhibit them to the public.

6.7.2. Libraries and banks

They are SSFI dedicated mainly to magazines, materials, projects, and sourcebooks.

The use of books and paper materials is less evident every day, thanks to the use of digital media. They are considered as a special place in SFI, since libraries count as not only books and texts but also as banks materials and spaces for archiving samples.

These spaces turn into important moments where materiality and tangibility converge.

They are also spaces that can devote themselves to serving as a deposit for materials, and elements that give access to first hand or complementary information that allows projects to advance.

Two cases stand out in this research, on the one hand the BIG | Bjarke Ingels Group.

One of the most essential characteristics of this renowned architecture firm's space is its scale model library. They keep pretty much every project they work in a tridimensional way and turn it into a live archive that allows them to go back now and then to retake concepts that have been developed for other projects.

And on the other hand, the space of the renowned Italian brand Alessi, known as an icon of good taste, and where many of the most important designers have worked in the past few decades, one of their physical spaces uses a considerable area as some sort of museum that has every project, process, model they have ever developed.

In this bank, we can find objects created by different designers, as well as by the company's engineering team and model makers.

Today, this closed doors touristic site allows you to discover the company through the history of their projects.

6.7.3. Complementary Support structures / Objects

a. Storage units

Furniture designed to store personal and work-related objects, some unique types are:

— Storage galleries: SSFI or elements where work in progress is stored, they are spaces that tend to be confidential and private because they store and keep trade secrets, sketches, works in progress and the like.

— Storage towers: Temporary file structures on wheels, allows for private things to be part of the environment and stores things that require a certain level of protection.

The possibility of counting with storage spaces is relevant and it is suggested that 30% of the actual space to be destined for storage (Doorley and Witthoft, 2011).

b. Walls, T-Walls, screens

Continuous and vertical elements to close and divide areas. Screen walls are supremely crucial in SFI, because they not only support separation, and the space delimitation of structures; above all, they are considered idea containers that turn into boards, which facilitate the exchange and storage of information.

Usually, the walls of innovation spaces are not fixed. They are proposed as flexible, washable, and digital places that can be used for all sorts of activities such as lanterns, projection screens, storage places, information screens, and others.

Some of them are entirely translucent, while others are completely opaque; some are configured as interactive screens, and others just serve the function of delimiting a space.

There are also T-shaped walls that can be self-carrying structures in charge of efficiently dividing spaces without depending on other elements for their sustainment.

— Mobile boards and walls: Vertical surfaces that allow the creation of war rooms, in which users can write and present team ideas. They are usually whiteboards, and there are some advanced versions with interactive screens.

— Projection screens: Screens or big lanterns that go from a series of televisions to projection surfaces. They are used for video conferences and collaboration work with other groups or project expositions.

c. Prototype kits

Carts, file cabinets, or drawers with a considerable number of materials and gadgets inside them.

They are structures used in halls oriented by Design Thinking principles in order to have them available for the teams in the room so they can create prototypes or light models that allow them to conduct usability tests, or build models for understanding or explanation in situ. One single category stands out:

— Prototyping carts: Small structures that allow storage of relevant samples and tools to configure prototypes of basic concepts in a straightforward way.

They have become famous and recurrent in creation areas for innovation.

A prototyping cart can contain items from Post-its™ to pieces of foam to configure 3D concepts to be discussed.

They support the concept of solving problems will the idea that first comes to mind. In other words, they are considered a mobile store on wheels that has a great variety of supplies, materials, and tools ready to be used.

d. Adaptive furniture

Chairs, sofas, benches and cushions with adjustable heights that are easily interchangeable and conditioned to the space., some particular typologies of singular elements found in the SFI where:

— The red couch (on casters): It is a red-colored upholstery seat, with an extended backrest and two arms, and instead of legs, it has wheels.

It has become an iconic symbol very present in most SFI, and especially on those related to the Design Thinking process (T. Brown, 2008).

This piece of furniture itself can configure and delimit spaces and it is typically used as a meeting point and reference. Its origin is linked to the Stanford Business School, where it began to be casually used.

The sofa is the element that allows the meeting for project evaluations. Evaluators sit on it, but so do the evaluated. It is an element that integrates and attracts, apparently with a more symbolic and emotional function than with a rational and calculated one. What is certain is that to find “a red sofa “it has been identified by authors like Hillen and Camacho (2015) as a kind of tradition that repeats itself in several places in Silicon Valley.

They have extended their influence on university spaces in other European contexts such as schools in Germany and Switzerland according to Brenner, Falk, and Thomas (2016) and are very popular in Aalto University in Finland.

— Post-it tables: Writable surfaces composed of pieces of paper that come off, whiteboards, or just writing screens, in which ideas can be presented efficiently, through modular tables that promote collaborative work.

e. Deco identity objects

Paintings, graphs, coats of arms, and symbols that become characteristic elements to project or allude to the culture of the place or organization hosting them.

— Motivational boards and posters: They are permanent sets of text written on the walls, printed in entry windows, etc. that seek to stimulate and make the users reflect on work, attitude, and/or philosophy.

— Variety of floors and textures: The surfaces in spaces usually create different atmospheres, whether it is for the type of floor or rug they have, to the walls' finish.

The use of alternative textures gives the possibility to explore and change the immersive aspect and perception of the place.

f. Gadgets

Small mechanical devices, materials and tools of especially ingenious use that complement the spaces of the SSFI. They are low cost and technological gadgets that allow us to interact and colonize space.

Before, office doors were closed to allow isolation. Today, open spaces allow for a series of ingenious elements to demonstrate and express emotions like free and busy, or happy and angry.

Announcements, flags, different “props” and gadgets colonize the space indicating everything from our mood to our willingness to work collaboratively; others help us in the development of projects, or reserving meeting areas in advance.

“Roomzilla” allows us to reserve a meeting room, “Luxafor” is a small LED light that we put into our computer to indicate if we are available or not to be interrupted.

Other elements, like “idea Paint”, allow us to turn a surface into a writing board integrated into the configuration of novel SFIs.

We are seeing a growing trend of products, systems and gadgets of all genres looking to become support elements of SFIs, and we should pay attention to their evolution and diversification.

g. Ludic props

Finally, the ludic objects to play and maintain a relaxed atmosphere, from balls, hammocks, and trampolines, to Ping-Pong or pool tables, and Legos close the cycle of complementary elements of spaces found in this research as part of space’s configuration.

CHAPTER VII

IN SITU RESEARCH & EXAMPLES [35]

After having analyzed the existing literature, I considered it pertinent to physically visit some spaces which have been mentioned or suggested by different experts as representative spaces to promote innovation.

Seeking to confront theory with practice and at the same time having the opportunity to interview its inhabitants and some of their main actors, my primary objective was to conduct an ethnographic research based on qualitative observation.

I focused on obtaining an accurate description of the space, its architecture, design, and function, and also on understanding the cultural aspects involved in its development by learning from its history, context, and culture, as well as understanding its configuration and the reasons that led its creators to design or promote it.

The common denominator always consisted in understanding how these places were associated primarily with spaces to promote innovation in contrast to those that were rather considered to stimulate creativity.

[35] NOTE: Although chronologically this chapter should appear prior to the proposed classification of the spaces for innovation, (since the visits and interviews were conducted with the purpose of validating the same), I decided to locate it subsequently to those, since I have modified adequate definition and classification in the light of the proposal and results of this research to add more depth to the examples.

In the same way, I understood during these visits how the spaces were perceived and adopted by the people and it also gave me the chance to identify and clarify the different classifications I have founded and proposed.

The spaces served mainly as a reference point to validate the workability of previously proposed classifications. Yet, some, like the IDIT of Puebla, allowed me additionally not only to observe but also design, investigate and experiment in the creation and formulation of a new SFI.

I first contacted a group of innovation experts from the University of Concordia, whom I initially informed of my intention to formulate a research project in this area and who gave me valuable feedback (complementary to that of my professors) to be able to advance this research, among them:

Anne-Marie Croteau, (Ph.D., Cdir 1st Associate Dean, External Relations and Business Development at John Molson School of Business at Concordia University, Montreal, Quebec, Canada), Nadia Bhuiyan, PhD, (Professor, Mechanical and Industrial Engineering and Director of Education, Concordia Institute of Aerospace Design & Innovation), Yong Zeng (Professor and Canada Research Chair in Design Science at Concordia University, Montreal, Canada Area).

Considering the importance of the city of Boston in the global context of innovation, it was decided to visit this place, which have been one of the most important Innovation Labs in North America—Harvard Innovation LAB.

Reviewed the Innovation Building of one of the most Innovative cities worldwide, the Boston Innovation and design Building (USA) and Meet the projects: Keep the change from IDEO to Bank of America, Genzyme center — Benhnisch Architekten , Barbara Lynch Groppo by C&J Katz Studio & Visual Dialogue, HotSeat by Context communication & Mad*Pow, Harbor Islands visitor pavilion by IDEO and Utile & reed

Hilderbrand, Preserve by Continuum, Glow Caps by Vitality, ZipCar , Cessna by DigitasLBi, Design Management Institute, Liberty Hotel by Korn design.

In this city, I also visited the largest co-working space worldwide: The CIC, Community innovation collaboration and interviewed Naomi Berlin[36], relationship Manager, Community Innovation Collaboration—Cambridge collaborative innovation center.

Then I reviewed one of the largest Innovation districts in USA, the Boston innovation district and interviewed Nicole Fichera, general manager of District Hall at The Venture Cafe Foundation Innovation District Manager for the Boston Redevelopment Authority.

I also interviewed Evan Spetrini operations assistant at District Hall and visited "Factory 63', the first building of housing innovation, and the space 'Mass Challenge', the world's largest program of business Start-ups.

During this visit, I also had the opportunity to study the Stata Centre Cambridge, Massachusetts MIT by Frank Gehry.

Subsequently invited by the government of China, I had the opportunity to participate as a speaker at one of the most important innovation events in the region, led by the most important design and innovation award—the Red Dot Forum, Xiamen Shanghai and one the most important innovation space initiatives for innovation in China—Xiamen International Business of Design Week.

In this context, I interviewed:

Sandeep Sangaru, Design director from India, Barbara Ferrazzi, branding & marketing responsible of Studio Volpi Italy, Wang Gang, director of the product design department

[36] (2014, September 30) *interview with Naomi Berlin about the space of the CIC as Relationship Manager of the CIC*. Boston

College of design arts and apparel engineering of Xiamen University of Technology in China, Jinsoo Park director of Cube design China, the design director of Lkk design China, the designer Toshihiko Sakai of Skai design Japan and Frederic Bonet, designer from yacht design China.

I then reviewed one of the most innovative factories of China—Duchi Group and interviewed Michael Xang from the business department engineering.

Then invited by the Hong Kong Polytechnic University I reviewed the space of one of the world's top 10 Universities of innovation design, the Hong Kong Innovation Tower of the Polytechnic University, designed by Pritzker-prize-winning architect Zaha Hadid, finished in 2013.

I interviewed Margaret LAM Yui Yim, project manager campus development Polytechnic University, who oversaw the construction of this project between the architects of Zaha Hadid and the Polytechnic of Hong Kong.

I then, reviewed a young innovation design Studio in Hong Kong—Asia Digital Mojo and interviewed Ayesha Amir Storyteller/copy Hong Kong.

In Montreal, having realized the great impact that a place like the neighborhood of the innovation has had on the industry of the city, I reviewed the Quartier de l'Innovation considered the largest concentration of information technology and multimedia workers in Canada.

In Mexico invited by the Ibero-American University of Puebla de México I proposed and created the first Innovation LAB for the technological institute of innovation of Puebla—I-Lab Ibero Puebla.

And invited by the area of technological design of Monterrey I had the opportunity to visit

the most important innovation space at educational level in Mexico, the Innovaction Gym at the Technologic of Monterrey and interviewed Ewelina Ferchowa, career director of the engineering and innovation and development campus Monterrey and the person in charge of this space.

In Monterrey, I also reviewed one of the best innovation expositions in Mexico the Expo regional arquitectura y diseño in Monterrey and meet the projects Max Art by Global consumer design Whirlpool, Centros de pensamiento colaborativo, spaces for social innovation in Zona Maco

To understand the new scenarios of innovation and design in the city of Miami I reviewed the Miami Wynnewood in Florida, a neighborhood, home of the art district and the fashion district, and the Miami Design District in Florida, a neighborhood dedicated to innovative fashion, design, architecture and dining experiences.

Later, interested in what happens in my homeland in terms of SFIs and vanguard, I was invited by the engineering faculty of the Caldas University of Manizales in Colombia and then I had the opportunity of getting to know the innovation project named “Neurocity”, an innovation space concept in the heart of the coffee zone in Manizales, Colombia.

Interested in all the design movement and SFIs that are being produced in Toronto Canada, I Finally visited the Ryerson University Student Learning Centre designed by Zeidler Partnership Architects + Snøhetta.

Throughout this research, it has become evident from a technological point of view that the San Francisco area and the Silicon Valley region, as well as places like Stanford University, the innovation spaces and research centers of Singapore, and the regions of Bavaria in Germany, among many others, would have been desirable to visit.

This does not imply that they have not been considered in the research; however, the selected spaces offered a logistical facility, an unprecedented opportunity to be able to observe first-hand examples in some of the different classifications.

Thanks to the previous activities, visits, and interviews, I selected the following places to expand their description, as I could identify them in the light of this research as the ones that were better associated with the category of SFIs.

Of these, some have been pioneers in their creation, others stand out because of their importance and impact in the context, and others are slightly mentioned because they intend to become in a space dedicated to such innovation in the future.

I hope that the following explanation allows the reader to better understand the morphological characteristics, functioning and relevance of these spaces, giving a clearer idea of what they are and how they were classified or reclassified according to this proposal.

In the examples, the reader will be able to find a description of the place, its history, morphology, and function, as well as some explanatory comments that allow a better understanding of my motivation and pertinence to include them in this research.

7.1. Harvard innovation lab (HI) (Boston, USA)

An (l-Lab) of 23,042 square meters, with a nearly $20 million investment, which is integrated with the Harvard Business School and was created with the intention of becoming a world leader of entrepreneurship in high technology.

Harvard University – more than 300 Million Dollars have been collected, 5800 students have started businesses, they also have successfully created over 575 ventures in five years, more than 75 companies have emerged and are active in the market, more than 1.63 million dollars in prizes have been awarded to students participating in competitions and challenges, and more than 115 thousand innovation events have taken place there to date.

This has not only happened because Harvard University has been recognized as one of the best universities in the world but thanks to the creation of the HI,

For this reason, HI became one of the logical points to be examined in the process of identifying the best SFIs.

Initially built in 1964, this building first accommodated the WGBH television studios, and then was abandoned until 2007, when it was decided to renovate it, to improve the thermal insulation and eliminate as many carcinogenic elements as possible but keeping the primary structure to minimize costs.

Today the facility is devoted to innovation and entrepreneurship, has 130 workstations and is supported by eight different Harvard schools (HBS, 2013).

The Shepley Bulfinch firm, with over 150 years of experience, designed this space. They designed not only the architectural project but also the place's visual identity.

The logo synthesizes the concept of the two letters “Hi,” which means both “Harvard Innovation” and “Hello.” Since the message pretends to communicate in a new manner to its community, it creates a welcoming feeling to the Laboratory.

The building is located at 125 Western Ave. and occupies 2 acres at the intersection of Western and Batten Avenues, framing the entrance to the Harvard Business School.

One of the goals of the architects was to make this an eco-friendly place. By preserving 75% of the original structure, they introduced natural light to the spaces, and in its exterior, they installed electric car-charging terminals and bicycle parking, which helped make this a Leed Gold Certified building.

This business innovation center was born as an answer to what Harvard could not attain in time for people such as Mark Zuckerberg and Bill Gates, who may have left because, at the time, the institution lacked the resources they needed—including appropriate spaces—to quickly transform their ideas into reality.

Today, this I-Lab hosts a wide range of ventures, from architecture to social innovation.

The Hi competes with MIT, which created The Martin Trust Center for MIT Entrepreneurship in 1990 as a center to support entrepreneurship and the University’s innovations. This center has earned notoriety for MIT and is one of the most recognized entrepreneurship centers worldwide.

HI’s objective is to give any of Harvard’s students the opportunity to develop their businesses, supported by a program that lets them grow and project it to scale.

To date, more than 3,800 ventures have been developed and over 200,000 people have visited since its opening in 2011.

The laboratory also hosts events such as Start-up Weekends and seeks to introduce students to mentors who will support them throughout the different stages of the process.

The laboratory states that its perspective is different from other institutions' innovation centers. The Hi will welcome students from any one of Harvard's schools and their direct focus is on the student's needs, prompting the faculty to support the orientation and decision-making, in addition to being co-governed by all the university's deans.

HI's approach focuses on the key learning of innovation, with courses on the subject that address topics like innovation and entrepreneurship spirit.

Also, it offers students several resources that help them develop their projects, such as evening workshops and seminars, dedicated office hours with experts, and the guidance of prestigious law firms to help students throughout the process.

Their philosophy is rooted in "learning by doing," through field trips to different cities in North America as participants in hackathons, boot camps and a wide range of fairs.

Finally, those who move forward to a more concrete stage of their projects are offered a program called "Venture Incubation," which grants access to a dedicated workspace and additional resources on guided tutoring, events, and private workshops, among others.

This space has a "reconfigurable garage-chic" look and is divided in the following manner:

-Community lobby: It includes an open cafeteria for those who attend conferences. It is a client-facing space, where informal meetings and conferences can be held. It also hosts events with innovators and business people.

-Student social/workspace: Practically located at the heart of the building, with a configuration in which three circular areas intersect toward a kitchen open to students, a bar-like coffee zone with chairs and a small playing zone or fun zone.

-Flexible classrooms: Located in the corner of the building, this space is thought to host classes and to be an auditorium with double access from the I-Lab or the lobby, seating up to 150.

-Workspace and workshop: Composed of rolling tables, it can host up to 200 students. This space is open and surrounded by approximately ten project rooms that are conceived as meeting rooms and project offices, depending on the needs at hand. Workshops have physical prototyping tools, 3D printers, and more.

-Entry points and zones: It has two zones, one of them faces the street, and the other faces the business school campus.

Among its most distinguished characteristics, is the flexibility concept, which creates a space that can be adapted and reconfigured. Inside of it, touchdown zones, or spaces to plug and play, work together with areas of accessible technologies that can be implemented in the future.

For Bulfinch (2011), the group projects become visible in this space, where much emphases is put into the use of whiteboards, to inspire students to write on its walls.

Within the category of SFIs, the Harvard Innovation Labs could be considered one of the best examples of I labs.

Students are given the possibility to receive professional advice, the incentives that provide the development of projects, as well as the use of their facilities, areas of interaction,

prototyping, incubation and networks.

The format of the Harvard Launch Lab, which is attached to the laboratory, allows to expand the potential of the place further and to consolidate a culture of entrepreneurship and business within its facilities.

7.2. The Boston District Hall (Boston, USA)

Innovation civic halls are a new trend of SFIs and, for this reason, I visited this OSCI designed as a civic space of 3,657 square meters inaugurated in 2014. It is considered the first independent public innovation center in the world.

Located in the heart of the innovation district in Boston, it is a building that transforms the urban environment to promote innovation, collaboration, and business spirit.

In 2001, the mayor, Thomas Menino (the longest running mayor that has been in charge of Boston), proposed an urban renovation of the city, and thus he encouraged the Innovation district project.

As a flagship of the project, he proposed the creation of a new building located in a natural meeting spot—between the Institute of Contemporary Art, a new public sports venue and several parks—all which would be accessible through a new bike path.

That is how a public-private association with Boston created a meeting space for the innovators that also anchors the city's emerging innovation district.

The result was produced by an intersectional organization seeking to create a facility that could turn into the "living room" of the district for entrepreneurs and the community.

David Hacin and his team were in charge of projecting the Boston public innovation center, thus converting it into the first finished building in Seaport Square, and believed to be the first "free-standing public innovation center" in the world.

Its objective was to create a public space, open to everyone that would mainly encourage collaborative work, contribute to strengthening the links between entrepreneurs and business people, and to catalyze innovation.

Venture Cafe, a non-profit organization, and a sister organization, Cambridge Innovation Center (CIC), oversaw operating and managing all the programming of the District Hall.

This organization, which was born four years ago during the CIC evening meetings, works to constitute itself as a defender of the community through the creation of relationships, which builds community through events and promotions in organized networks.

Rodriguez, Congdon, and Ampelas (2015) argue that the whole project was made possible by a tax agreement from the city of Boston, in which the only space that had to pay property taxes was the restaurant inside the building (because of its commercial function).

According to Fichera [37] the building emerged as a kind of experiment. It was known what the architects and project creators wanted to do, but it was not really known if a structure of this size would support the economic weight and keep the community alive.

They knew it was going to be big and expensive, and they also knew they might have the location, but since no clear precedents existed for this type of environment, it was not known how the space was supposed to look or feel, explains Nicole Fichera [38]. "The project was

[37] (2014, September 24). *Interview with Nicole Fichera about the space of the District hall as General Manager at The Venture Cafe Foundation*, Boston.

[38] (2014, September 24). *Interview with Nicole Fichera about the space of the District hall as General*

not easy. It was not easy for anyone involved. There were a lot of moments where things weren't clear" (Rodriguez, Congdon, and Ampelas, 2015, p. 16).

At last, it was conceived as an internal structure that easily allows modifications. The primary design objective was flexibility as the focal point, so people could have access at a meager cost or sometimes at no cost.

Built where the old Boston train depot used to be, it is oriented facing the water and it is separated from the sea by just one adjacent park. This place reminds us of the industrial past of the area.

Inside it, we find a flexible assembly space with a capacity of 250 seats named the Brew. It is a meeting space with living rooms and worktables, a series of flexible spaces that allow for a variety of uses, including meetings, classes, and exhibitions, and more.

An open-workspace, auditoriums, writing flexible walls, classrooms, montage spaces, a restaurant, and, of course, an open coffee shop feature networking and event spaces that allow people to work alone or accompanied.

This place is surrounded by more than 1,828,800 square meters of future development, and it has two primary structures that were inspired by the cars that once populated the space. Its angular casing evokes the shapes of boats and warehouses that are in front of the sea.

The most exciting thing about this initiative is the vast number of interconnections that are being generated. Today it hosts more than 650 events and meetings per year. More than 150,000 people visited in 2014 and they have donated more than $1 million in terms of spaces for events related to innovation.

Manager at The Venture Cafe Foundation, Boston.

From the point of view of creating SFIs, this place, besides being considered as one of the pioneers, really favors and enhances the Boston community of innovators.
Perhaps without conscious intention, they have managed to create a balance between the social aspects and the business aspects that allow these relations.

However, as long as this place is more perceivable as a starting point and incubation of ideas and not as a place of realization of projects for innovation, its main feature will continue to remain a cultural center and a hall.

An ideal complement to the hall may be that it pays more attention to how it could favor the incubation of projects in its vicinity.

For example, and admittance to the 7s workshops which will enable the innovators to access more tools for the development of projects and ideas as well as the interrelation between academia and industry, since the latter is a vital point of convergence in the territory of SFIs.

7.3. Cambridge collaborative innovation center—CIC (Boston, USA)

Considered as the most significant co-working space in the world, it hosted 800 start-ups, and it has generated investment capital of more than $1.8 billion. It occupies 45,720 square meters in extension, and in alliance with accelerators, co-working spaces, laboratories, foundations, innovation districts and even software to manage the reservations for the conference rooms (bred in its interior), it is one of the most remarkable business incubators in the world.

It is a space concept created with vision and for visionaries. It is the forefront point between the workspaces in the city of Boston, which has been evolving and helping entrepreneurs of all sizes to grow and succeed as stated by Studio (2011).

Timothy Rowe and Andrew Olmsted from MIT founded the company in 1999. It began with 250 square meters. In 2005, Google established its New England headquarters in these places led by the Android[39] co-founder, Rich Miner, until it grew so much that it had to move to a space near the CIC.

This is the principle of CIC: to make connections between two people who find each other while working, and then something new is produced or discovered.

CIC is conceived as a progressive space in every sense of the word, designed with advanced ideas, focused on the improvement and advancement of society.

This is reflected in the main idea and origin of their vision: "To make the world much better" according to the CIC (2016).

And given the number of companies that it hosts, its spaces are organized in a way to make the management and development of their operations more efficient in keeping with its needs.

It offers several levels of offices that can be adapted to the needs of each entrepreneur, such as continuous spaces or co-working spaces with an emerging model, designed for companies that are starting with large comfortable areas where you can interact and collaborate, with other co-working spaces located in open areas where every entrepreneur can sit and act independently.

These last two can also share common areas like the comfortable and modern boardrooms with advanced technology to meet with clients, make presentations, and have private

[39] Android, Inc.: Was founded in Palo Aalto, California, in October 2003 by Andy Rubin (risk co-founder), Nick Sears (once VP at T-Mobile), and Chris White. This place (the CIC) is considered to be an important point in their origin and projection. An idea out of two that later turned into a space for hundredths, forced them to move to a new independent location according to Berlin (interviewed, in September 30 of 2014)

meetings.

It also offers a great variety of options when it comes to the experience and the type of business—if the entrepreneur needs to be on the phone for a long time, if it is necessary for him to have video conferences, or if he needs privacy to focus. Alternatively, if the company is at a more advanced level and requires space to interact with employees.

The CIC space was conceived to be full of people, to be well used in its plenitude. Therefore, it is divided functionally striving for users not to feel enclosed or suffocated. On the contrary, the areas are designed with an open vision, with natural materials and colors in wood and glass, thus facilitating the continual passage of light, but isolating the noise. A sensation of an endless and continuous space, combined with generous illumination and an open terraces system gives it a warm, welcoming feel.

One of the main focuses of the CIC is helping new companies to create relationships with other external entrepreneurs, venture capitalists, and financiers. Therefore, they have areas for events and networking, carefully thought to bring together different communities, invite other tenants, and, for example, to assist with events at the coffee-space (Venture Café area) with its warm and comfortable tables that allow gathering, and the exchange of ideas or presentation of projects, and to have a good time (Studio, 2011).

CIC also offers cutting-edge spaces for the development of projects for new products or services, with all the necessary accessories and technology in the Lab-Central. The Lab-Central is adapted for different functions like meetings, social interaction, as well as offices focused on work and independent furnishing areas, equipped with every accessory, utensil, and material needed.

It also comes with areas equipped for projects that require high technology, which is mainly used by companies from the health, food, biological, chemistry industries, etc.

The CIC was thought of as a great space that favors emergence and growth, where knowledge is developed with a sharing attitude.

It was also thought of as a space that evolves, adapts, and always keeps a favourable view of the future; where you find everything, you need inside this seven-story, work-focused building.

Naomi Berlin[40] mentions that for people to get to know the project, CIC does not come with a marketing team, just its renown and brand recognition draw people there through "word of mouth."

The most relevant part is its networking ability since the space hosts a great variety of companies under the same roof, which increases their capability of interacting and naturally exchanging ideas.

Also for Berlin, it provides "co-working space for someone that has just begun to have a cost around 350 dollars a month, which is the same you would invest if you went to Starbucks."[41]

Many people work from home, but they come into the space for meetings or in a way that all of them find appropriate services and environments.

For example, it has rooms in which people go in at an established time and talk about an idea; these rooms are reserved through the "Roomzilla" platform (a platform also developed by a company hosted in the CIC).

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[40] (2014, September 30) *interview with Naomi Berlin about the space of the CIC as Relationship Manager of the CIC*. Boston

[41] Ibid. p175

In this meeting place, different kinds of communities can be appreciated and in all these places you can find Wi-Fi.

There are rules within the space on how to work, talk and behave for everyone to have an exciting and flowing communication.

Each floor has a kitchen and an entertainment and relaxation room with games and things that will make the users feel comfortable.

Regarding these spaces Naomi Berlin comments that "in the coffee places, innovators have a moment to relax, they can listen to music at that moment, they come to talk with other people and then go back to work."[42]

They also have "no research" spaces, which are some sort of Huddle rooms, which people use to talk, create and think differently.

As of now, the CIC has expanded farther from Boston and it occupies 42,672 square meters in the Dutch port city of Rotterdam, where it hosts 500 companies. It will also open new offices in the innovation district of Miami, where it expects to occupy 21,366 square meters dedicated to innovation.

From the point of view of innovation, this space can be considered as the state of the art of private projects. In it, we find the ideal mix of design, methodologies, and proposals that favor innovation.

[42] (2014, September 30) *interview with Naomi Berlin about the space of the CIC as Relationship Manager of the CIC*. Boston

7.4. Hong Kong innovation tower (Hong Kong)

An innovation tower with an elevation of more than 78 meters, with 75 stories, and 15,000 square meters of construction, was inaugurated in 2013. It hosts 1,800 students, with an investment of $249 million. It is home to the renowned design school of Hong Kong PolyU, as well as the Jockey Club Foundation, and was created to become a city icon.

In this city, schools, houses, supermarkets, daycares, pretty much everything is in a tower. Therefore, it is not a coincidence that a tower was the symbol that academia and the city wanted for its innovation center.

The innovation tower is located on a narrow parcel of land with an irregular shape in the northeast corner of the Polytechnic University of Hong Kong campus.

The university has an excellent reputation around the world, especially for its design school, which is considered to be the best in Asia.

The project idea consisted of creating a building that would enrich the community and promote Hong Kong's innovation spirit. It comes with a conference room, multiple classrooms, design studios, and workshops, as well as a design museum, exhibition area, and a common hall.

Its construction was possible thanks to a donation from the Hong Kong Jockey Club; a horse race operator considered the most significant benefactor to the city.

A board formed by the president of the university, the representatives, the foundations,

advisors, and architects selected five architects and invited them to present a design proposal through a scale model and a presentation.
The architects were required to design an innovative, iconic building that would help promote not just the school, but also the city of Hong Kong.

Finally, Zaha Hadid's proposal was chosen for its level of madness and differentiation.

The construction started in 2009, with the additional goal of providing space to facilitate interdisciplinary research and education in the field of design.

"The fluid character is generated through an intrinsic component of its landscape, floor plates and louvres that dissolve the classic typology of the tower and the podium into an iconic seamless piece. These fluid internal and external courtyards create new public spaces of an intimate scale which complement the large open exhibition forums and outdoor recreational facilities to promote a diversity of civic spaces" (ArchDaily. 2008, para. 3).

The space is divided as follows:

Basement level: This level has the entrance lobby, where wood and metal workshops, a photographic studio, the television production workshop, transport design laboratory and an underground passage for future developments.

Ground-level floor: Occupied by the main entrance lobby, the Ground floor-level also has access to the transport design laboratory, the multimedia workshop, offices and an exterior level.

Square level: Located off the Suen Chi Sun Memorial Square that connects with the rest of the campus and diverse schools. It opens the way for the podium level, in which there is an

exhibition hall open to the public that is a kind of forum, and an open display case without any columns.

The lobby also allows access to an open space that takes us to the shared facilities, including a store, outside cafeteria, a museum, as well as a gallery of open exhibitions, and an exhibition space.

The tower of the building is characterized by long ramps and levels around a large central opening that allows viewing it in a zigzag or spiral through naturally illuminated slipways; their path makes it easy for us to contemplate projects and exhibits of student work along the same.

Auditorium level: Located on the third floor, there is a 300-seat auditorium with a futuristic style.

The architect's architectural language inspired each element, and each one seems intentionally designed to promote interaction between the inhabitants of the space.

Levels 4 through 13: From the main entrance or square level, there is a long and imposing escalator that leads to the auditorium, and from there, to the next two teaching floors, each one demarcated with the name of the school with which they are affiliated.

On the fourth floor, we find project spaces and the coffee area with an outdoor terrace.

The fifth floor is designated for Design Studios, research laboratories, a meeting room, material library, and an area of temporary exhibitions.

Then, in each one of the following levels, the natural and sinuous forms, as well as the unusual aspects by Zaha Hadid give the building a very special iconography and turn it into a monumental, functional, and organic structure that stands out from the Hong Kong

settings.

On the 10th floor, we can find the teaching areas, and on the 13th floor, there is a unique exhibition space.

This tower represented significant construction challenges, because in addition to being structured like a production area, a design laboratory, exhibition areas, atrium, classrooms, project spaces, offices and computer laboratories, it was a new kind of construction in Hong Kong.

It represented work with a great architect, and it also had to be developed in record time to move the design school to the new facilities.

A small building had to be demolished, and the Jockey Club Institute for social innovation had to be relocated in the area. It now occupies one of the top floors of the tower.

For the building architects who worked on the project, a Zaha Hadid building implied an innovative challenge, because it had an unusual facade, and they had to overcome many technical obstacles of construction as reported by LAM Yui Yim[43]

Due to the nature of the inhabitants that walk through it now (design students, musicians, artists, architects) they expected to use the corridors and common areas, even the classrooms, but today it is used in a different way from what they had intended.

Students are transforming the open spaces in ways they had never imagined.

[43] (2014, November 12). *Interview with Margaret LAM Yui Yim abut the innovation tower space as Project manager Campus Development of the Polytechnic University*. Hong Kong.

The long corridors and the numerous slipways accidentally gave them the chance to use them as cocktail bars in the inaugurations or to convert certain angles into stages in a very creative way.
LAM[44] says that because of this, every time an event is organized inside the space, it is a surprise to observe how the inhabitants adapt the space to their taste.

While being different from the traditional academic building in Hong Kong, the place feels more fun, people prefer the slipways and use them to take pictures, dance, or do something really different, even skate!

Even though most people think Zaha Hadid worried more about the facade and exterior forms than the interiors that were not the case. Her preoccupation included resolving the interior design, and even though they wanted to do very different things, there were compromised to rationalize the use of the spaces and for both parties to be satisfied.

The most challenging part of the project management was the implementation of the first building of this type in Hong Kong. At the same time, the project manager had to worry about satisfying every user, from the maintenance staff to the faculty, and that is without even talking about the maintenance this kind of edification requires, which pushed them to look for equilibrium between the user and the designer.

In an interview, I conducted with the architect in charge of the project for the PolyU. She, mentions that "This kind of activity of dialogue and bonding is not easy, especially when there is a building as difficult to build, a limited time and budget, with an under-pressure job" Moreover "Everyone had a different vision of the building, the materials to use, paintings, from the maintenance people to the security manager, who was worried about the inclination of the elements. Many even asked just to make the walls vertical."[45]

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[44] (2014, November 12). *Interview with Margaret LAM Yui Yim abut the innovation tower space as Project manager Campus Development of the Polytechnic University*. Hong Kong
[45] Ibid. p 179. .

In conclusion, Zaha Hadid's innovation tower is primarily presented as an innovative project rather than as a project for innovation, but apparently, this tends to change in the continuous use of its facilities and the rearrangement of some of its aspects.

Creating a tower of innovation must not only represent a challenge from the morphological point of view, but it is also about how its architecture transmits the culture of innovation through its risky forms and configurations.

Also for an innovation tower such as Hadid's project, it is essential to consider the functional aspect of innovation, in other words, how the different configurations of spaces and their interrelationships will favor the culture of innovation flourishing in the served community.

A relevant aspect to consider may seem superficial, but designated outdoor cafés of this tower could widely become places for community interaction.

In this case, the coffee place should not be projected to the bottom of the tower but in the heart of it.

Similarly, spaces for workshops and laboratories should be conceived to foster the interrelation between different disciplines and it is desirable that spaces exist inside this tower where they can strengthen and promote businesses and ventures generated by the community, where students and academics can create, incubate and grow.

The towers of innovation should also contemplate areas of work that allow to disseminate the knowledge at different levels of the community and not only from the academic point of view.

The phenomenon of innovation towers is recent and lends itself to much exploration.

By studying the layout of the tower, we can deduce that common areas beyond private are ideal spaces for it to flourish. However, to propose I- showers and closed areas of temporary individual work is something that will bring much higher value to the architectural proposal of this tower.

7.5. I-Lab of the IDIT (Puebla, MEX)

The Ibero University's Technological Innovation Institute hosts an I-room of 115 square meters, which was an $80,000 investment, and is considered the first of its genre in the country. Its objective is to become a place where all of Puebla's innovations emerge.

The I-room called I-Lab, was born from the need of the Institute of Design and Technological Innovation (IDIT for its initials in Spanish), part of the Iberoamerican University of Puebla (Ibero Puebla).

Puebla is considered the university capital of Mexico, because of its great concentration of prestigious education centers. It is characterized by a large manufacturing company presence that contributes over a quarter of the city's GDP. Its industry is mainly from machinery, metal mechanics, foods, and textiles.

Puebla hosts one of the biggest Volkswagen assembly plants in the world, where every day 1,600 "new beetles" are manufactured. Soon Audi's most modern plant in the world will be unveiled, which will produce the exclusive Audi Q5 model.

As part of this strong industrial activity, getting close to cutting-edge technology and local appropriation processes, the Ibero Puebla set out to collaborate closely with society, private and public industry, as well as social organizations and particularly micro, small and medium-sized enterprises.

The Institute of Design and Technological Innovation (IDIT) was inaugurated April 23, 2011.
All of the Ibero University's laboratories and workshops from the different schools of the university were moved to and concentrated in a two-story, 7,400-square meter building, within a 5,700-square meter plot.

This way, the workshops of basic electronics, electronic instrumentation, power electronics, the finance and business (where stock market simulations are made), a photography studio, as well as workshops for interdisciplinary drawing, weaving and patternmaking and industrial design share the same roof with microbiology, sensory evaluation, climate change, land management, and physics and chemistry laboratories as well as a capture and image edition room and a food pilot plant.

The IDIT also promotes the participation of different actors with an open and interdisciplinary perspective, lodging student, professor and young entrepreneur's start-ups that seek to solve specific regional issues. (Among their constituents, they have the inventors of an 8-meter-long tactile and interactive screen, considered Latin America's largest.)

For this reality, there was a need to create a space within the IDIT to serve as a point of academic training to generate an efficient dynamic between the university and the served community, and that would contribute to the integration of different laboratories, workshops, entrepreneurs, students, professors, and other community members.

It was also strategic to have a space that projected IDIT's primary intention to remain at the forefront and to be the pioneer in local transformation and innovation processes.

In 2013, the innovation-specialized firm CD&I Associates (under my direction), proposed the design of an I-room that will become an I-Lab in the future.

Starting with 115 square meters, its objective was to be the starting point and incubator for ideas and innovative projects, shaping new business, product and service models.
The task was not only to formulate and create the space, but also to present a custom-model that allowed the development of IDIT's strategic vision, and turn it into the best innovation-promoting experience.

The main objective was to design a low-cost space (given the physical limitations that the Institute had) that could be attractive, and appreciated by the community, and that allowed the integration and articulation of the companies incubated in it.

The proposal consisted of bringing together in the same place all the necessary elements to create innovative projects that could be approached by different community members.

As a result, a place that allowed the incorporation of different methodologies of both Design Thinking and lateral innovation processes was projected.

The space equally promotes the seven key stages to trigger innovation as presented by CD&I Associates (define, research, propose and exchange, prototype, test, improve, and delivery).

At the same time, this space was planned to be so versatile that it allowed development of its own methodological scheme, as well as any other proposed by external consultants, professors or entrepreneurs who came across this I-room.

The result was a space divided into four main areas:

Reception and preparation zone: A receiving lobby that is composed of a reception where different participants register, and where the logistics and administration of the place are managed openly and collaboratively.

It includes a preparation room where people get to know the different methodologies and subjects that are going to be applied in it, as well as the different projects and relevant data.

Equally, a touchdown space, where people have the chance to prepare for cooperative work or to go back to, so they reconnect with reality.

The space has a storage gallery, where the assistants can comfortably store their belongings (cell phones and other possessions), as well as their shoes.

Part of the experience of this room is a ritual where entering the work center without shoes is considered a priority.

The place is complemented by a queue and available spaces screen, with an information system that allows making reservations.

The whole entryway was decorated with QR codes in the walls that, when scanned, lead to successful innovation cases, as a way of a first landing and socialization with the place.

In this area, assistants inform on how to work with innovation, what the I-Lab is, the available tools, and what are the stages. This is also where users present and identify themselves.

Some of the rules highlighted are: Unplug from the real world (leave aside cell phones and tablets), do not leave the I-Lab until you have a project working, and be ready for teamwork.

Transition zone: A hallway that connects the I-showers with the incubation and the preparation zones.

Within this place, the wood flooring allows for the movement of elements in it. It also counts as a library space and features refrigerators and a coffee bar among other amenities. Even though the IDIT has several cafeterias and a restaurant, it became necessary to think about a coffee space for the participant groups.

It should be a space that favors spontaneous communication and environmental comfort, and that minimizes the potential of people abandoning the campus without producing an idea or project intended to be developed in the different Workshops 7s and laboratories of the place, which are a mere 30 seconds walk away from the classroom.

Incubation zone: It is considered the project's main space, and it is upholstered with artificial turf, which allows users to feel a transition between the different zones and gives participants the possibility of working in a relaxed way.

This area was projected as a great hall with walls to draw upon, windows that turn into war rooms, and boards to paste with Post-its™, as well as Post-it tables and mobile chairs, both with adjustable heights.

The space can be divided into two sections that allow simultaneous activities for different groups of participants.

Also, a projection system, prototype kit, and playful props such as cushions that look like rocks were introduced into the space. Screens were proposed to administer the time management and methodological steps, among others.

Post-it tables contain paper rolls that allow generating ideas, and it is worth noting that all the elements were entirely built inside the IDIT Workshops.

A big storage tower divides this space from the transition area and it is equipped with spaces

to locate prototyping carts. These carts contain tools like six thinking hats[46], toolkits, writing materials, games, screens, and work elements, as well as gadgets, refrigerators, video projectors, and electronic screens.

The room has been conceived to work for three different uses each a day.

Morning is to educate the Ibero students and IDIT members; afternoons are a time to work on innovation projects under the motto: "where ideas take place;" and during the night it is used for innovation meetings and networking.

It also comes with technological resources such as video screens with web access to Google docs, Skype, and soon a countdown clock will determine the timings at each stage of the process.

The space is flexible and it transforms in line with the current stage of the process.

It intends to promote teamwork, and there are plans to install a light changing system to indicate the different moments/phases of innovation the participants are in currently.

From the methodological point of view, this hall is meant to plan, find and formulate questions, as well as to incubate ideas working on the compilation of information, identifying scenarios, working with methodologies from Brainmapp™, and mental maps and also working in social, economic, cultural, geographic studies, identifying patterns, development tools, clinical histories of the problem, and many others.

Another stage worked inside the space is related to what is known as FuturisThink™, which consists of learning how to formulate a general vision for the project, show and

[46] Edward de Bono. (born 19 May 1933) is a physician, author, inventor and consultant psychologist who wrote the book Six Thinking Hats and originated the term lateral thinking, he also teaches thinking as a subject in different schools.

visualize a concept and idea through images and strategic time sequences for implementation and resources.

It also incorporated the conclusion and maturation phase of projects where each person formulates their ideas, and shares them with the rest of the team to find common scenarios.

As an important part, the screens and walls project the stages and rules, and in most cases, an innovation coach follows the whole process from the I-Lab.

Finally, this area strives to get to the validation and impression phases, where the final objective is to leave the room with a defined idea, an innovation plan, or printed project and a prototype, and the most important thing is to come up with measurable and quantifiable goals backed up with a feasibility analysis.

Isolation zone: This zone is critical because it is the area that allows individuals to pull away from project, reflect, or think without being interrupted by third parties.

The areas of mental concentration become particularly useful in a space like the IDIT, where the noise from the workshops and laboratories, as well as people interacting, diminish the capacity to focus and concentrate.

The main characteristics of this zone are:

a. Comes with “I-showers” that allow people to enter an arena of auto-concentration and internalization.

b. Each one of them was designed under a playfulness theme, from a serious, traditional space with a folding table to a space with a swing and a ball pit.

There is also a more sociable cubicle to host small groups of two or three people who wish

to join up for a period, seeking to isolate themselves from the rest of the activities.

These isolation zones allow users to change their working approach, going from private rooms to an auditorium.

Lastly, the individual zone enables users to reflect independently on the stages of conclusion and maturing, where everyone takes refuge to work on his or her ideas.

This process of assimilation is fundamental, because even though innovation is achieved in a team, teams that work in these areas do it faster when members can mature their ideas in an isolated way and later visually share them in the incubation area.

Complementary service zones like Bathrooms and complementary services were located next to the facilities of the I-Lab, but not inside, with the intention not to generate additional dispersive elements in the compound. However, these complementary services are 7 seconds away from the space.

Likewise, every laboratory in the IDIT does a part of the interconnected services, and each of them turns into an innovation opportunity.

Therefore, one of the primary objectives of the I-Lab consists of connecting the workshops and laboratories, as well as their associated human teams, so that it becomes the point in which innovation begins.

For this reason, his selection as part of this research was not random but somewhat intentional, as it allowed me to direct the design and development of the innovation laboratory for the Universidad Iberoamericana Puebla through the Institute of Design and Technology Innovation (IDIT) as Director of CD & I Associates.

The difference of this laboratory with others on the market is that it was built as an I-room within a technology center where all the laboratories of experimentation of the professions and areas of education of the university meet. In this way, this room became the axis of the encounters that allows the projects to rise and it is within that space that they also converge and conclude.

With its creation, I could test, validate and put into practice different morphological and methodological models to stimulate innovation.

7.6. Innovaction gym (Monterrey, MEX)

An I-room that could turn into an I-Lab. Founded in the education and research sector in Mexico, it covers 1,100 square meters of construction and was inaugurated in May 2013.

Monterrey is the third most important city in Mexico, with a total population of 4.45 million as of 2015, and it is considered the city with the best living standards in the country, and one of the most developed ones.

There, you can find one of the universities with the best academic recognition in Latin America, ranked as 238 in the world conforming to the QS (2015). It is known as the best business school in Mexico and the one with the most registered patents in the country.

Right at the heart of the university campus is the Innovation Gym. Located on the second floor of the north tower of the Advanced Technology Center (CETEC), it is an emblematic building with an avant-garde design that was inaugurated in 1989.

This same tower hosts other laboratories like the artificial intelligence, computer

science, and knowledge systems, electronics and telecommunications. The tower also hosts an academic services attention center, as well as different service departments of academic data, information engineering, technological innovation, telecommunications, information networks, and computer technology.

It was created with the intention of encouraging innovation between the different members of the community, especially the students from the Innovation and Development Engineering program of the Monterrey Campus, as well as the faculty staff, students, and people from the Tech community.

Students access activities to train the mind and body, in playful and comfortable facilities that favor creation.

Within the space there is a group of teachers who call themselves the “School of Athens Coaches” who specialize in research, engineering, and human sciences.

The space is divided into the following areas:

— Fractal lounge: Right outside the red-door elevator there is a reception area. A circular counter is connected on the left with professors’ areas and on the right with spaces dedicated to meetings.

  The lounge comes with different colored chairs, sofas, hammocks, and elements that allow meetings and informal work by the participants.

— Innovation spheres: Toward the perimeter of the fractal lounge, on the right side of the space, there are working areas enclosed by glass walls to stimulate collaborative work supported by moving boards, tables, different colored chairs, a mobile television, meeting room, and a room for a videoconference.

— School of Athens Hall: It is the place where the student projects are criticized by experts and six members from the interdisciplinary engineering department of the engineering school who are in charge of managing and following the students' progress.

Each of them has an office space closed with dividing glass walls. Inside them a desk, three chairs and connectivity tools where through semi-annual reports the teacher checks on the success of students and evaluates the results based on the number of products, projects, patents or new ideas and won contests.

In the outer hall, a sofa is configured as the waiting area for students interested in receiving advice.

— Sparring room: It is the space dedicated to a meeting room, and it is characterized by having a punching bag. This room has a table at the center, surrounded by 12 executive chairs. It serves the purpose of hosting conferences and video conferences with people, advisors and members of the community or from abroad.

Outside of the room, in the open space, a billiard pool table complements the environment.

It is also common to observe trampolines and swings in it, as well as cushions in some areas.

— Forensics lab: Toward the back of the space, to the right, there is a laboratory area composed of maker stations for students working primarily in electronics.

This space has chairs and welding stations facilitating the development of engineering workshops.

It is a long space with mobile boards mainly organized for the creation of circuits

and the elaboration of electric prototypes.

Prototype carts and mechanics on wheels are found in this zone. They allow storing pieces of circuits and other electronic components.

The tables have lamps, magnifying glasses, and soldering irons as part of the permanent endowment.

— Frankie lab: This area was created to organize events about innovation and it is accompanied by a fast prototyping laboratory, as well as a hall and a locker zone with tools the students can use to produce electronic prototypes.

The director and designer of the site believe that "the best space to innovate is the one that allows the user to work on its own and also making teams in every stage of the innovation process, thus proposing different scenarios for different ways of thinking; divergent, convergent."[47] Thus, the innovation Gym is the ideal place that seeks to be very dynamic and offers processes and tools that ease the focus, because it promotes movement, and the possibility of working in different body postures because it is based on the idea of co-working and co-creation.

Also, the innovation Gym also has a consultation area for technological patents. Next to it, there is a Maker laboratory for students to explore the construction of their projects.

The Gym has considered of expanding to the Eight-Tec campuses in Mexico, starting with the one in Chihuahua City. It is also considering being certified as a FabLab, for which they are applying for $281,000 in funding through sponsorships and federal funds to equip the laboratory with more machinery.

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[47] (2014, December 10). *Interview with Ewelina Ferchowa*. About the space for innovation of the Tech of Monterrey as *the Career director and innovation developer of the Campus.* Monterrey

To conclude, we can add that the Innovaction gym, has many areas to improve.

The distribution of the spaces in its interior generates a great disruption among the communities that coexist in it. Although it has individual work rooms, these are constantly interrupted by collective activities.

It also lacks social areas such as coffee, cooking or similar spaces, that have been shown to be vital for the development and creation and interactions between communities of innovators.

In addition to the space, although it has creative laboratories, it limits itself in respect to the access to them and leaves only an emphasis on electronics, not considering other types of laboratories that can contribute to the creation and configuration of the laboratory success, such as business and/or markets labs.

Its location at the heart of the campus brings it closer to the administrative areas of the university, but it distances it from the entrepreneurial action and the laboratories of the institution.

Perhaps the initial primary intention was to project an oasis within this place, but in reality, this oasis of creativity may be staying isolated from contact with reality, since the different elements that intervene in it lend themselves more to interpreting it as a casual room exploration.

These types of innovation laboratories should seek more strongly to improve their strategic geographical position by approaching communities of entrepreneurs, funders of projects and creators, as well as workshops and communities.

The intention of the space is altruistic and positive, so maybe much of the advice that will

be presented at the end of this research can come very well to recompose and rethink some of its design and architectural structure, in order to favor the development of innovative projects.

7.7. Neurocity (Manizales, COL)

An I-room, 360 square meters, nestled in a natural reservoir of the Colombian coffee belt, with a $200,000 investment, created to celebrate the centenary of the Chamber of Commerce of Manizales by Caldas as a city project and conceived as a complementary process to strengthen the regional innovation ecosystem and competitiveness processes.

Innovation is not only a matter for the developed countries but also one for the developing countries.

As a native Colombian, I am specifically interested in knowing which projects of vanguard stood out in my homeland. Through my research, I found that one of the regions of this country that has continuously received more attention in terms of economic funds to support innovation is the Manizales region.

Colombia has been traditionally characterized by its coffee as one of the pillars to boost its economy and it remains one of its main export products. Nowadays Colombia promotes a project in the heart of the coffee zone to find ways to continue strengthening its process and innovation along the way.

That is how Neurocity can be found in the vicinity of Manizales, Colombia.

This project, led by the local Commerce Chamber, is located in what could be considered an oasis near the city, because nature surrounds it.

Manizales is characterized by its coffee industry and its rum production. It is one of the "intermediate" Colombian cities that, with academic support, has begun to support the innovation and industry processes actively.

Property of the Caldas's Departmental Committee of Coffee Growers, the Jaime Restrepo Mejía Reflection Enclosure, a 1,790,000-square meters' nature reserve, hosts the Zeri Pavilion (a stunning guadua structure, created by the Colombian architect Simon Vélez), a butterfly observatory, an orchid (Colombia's national flower) forest, a garden of aromas, a gazebo bird, ecological paths and even a chairlift system.

This construction was recently integrated into the enclosure as a small autonomous pavilion. Inaugurated on February 14, 2014, this space has welcomed more than 5,000 people who have participated in different training processes and high-level formation for people in business, innovation, and creativity-facilitating activities, change-managing projects with interdisciplinary teams of students, professors, and regional professionals.

The space concentrates on three main activities:

a. Personalized support in business's problems

b. Creativity and innovation technique training

c. Inspiring and functional spaces, designed to stimulate the creative processes (SC, 2015).

Apart from being the first Creativity Lab within a Commerce Chamber, what makes this space unique is that its whole design concept was based on creating a thought space in the same way in which the brain is divided. The Lab is segmented into four main rooms, each one characterized by a distinctive color.

From the entrance both rooms to the right are called the “divergence” sector and the two to the left are the “convergence” rooms.

— Divergence room: The classrooms on the right are focused on activities to exercise the mind. The first one is orange-colored and is known as the divergence room. It focuses on exercising the mind through play. It comes with an Xbox console, sofas, and digital games to stimulate ideas.

— “Saltamentes” room: This next classroom is yellow and the name “saltamentes” means “mind jumper,” and it is a place set aside for idea generation work.

It is equipped with chairs, tables, and tools to build low-light technology models, a kind of light and fast prototypes using everyday materials like paper, cardboard, sticks, and glue.

— The convergence room: Located on the left side of the entrance is the space where the participant can start to consolidate ideas.

This is a white classroom, with chairs and worktables and the intention is that the teams can evaluate proposed ideas to determine which is the most convenient in terms of viability, innovation, and market.

— The “pensatica” room: The fourth room, on the right, in Spanish is “pensatica”—a sort of “thinking” room.

It is presented as the area for idea exposition, equipped with a digital board, and it is for the presentation of new projects, business ideas, and different products that come out as a part of the creative dynamics. It is also considered the decision-making area.

— The brain gymnasium: An exterior terrace found on the left side is known as “the brain

gymnasium," where they encourage people to exercise their mind through their local methodologies called "wake up brain" and "knowbrainers."

The laboratory has two, fixed-term employees who are responsible for providing support to businesses, entrepreneurs, and working groups that wish to use these facilities.
On this visit, I noticed that the space still lacks a solid structure and design to promote innovation processes.

On the one hand, the design of the space that allows the possibility of initiating contact with entrepreneurs/innovators and of promoting the development of connections and businesses among them is limited (lacks points of meetings that increase the bum rate). It also lacks individual working areas as I-showers and interconnections with the external business and scientific context (it is associated with a chamber of commerce, but does not have a direct link with a research or academic center).

And on the other hand, the place is predominantly structured as a space for the generation of creative ideas, rather than functioning as a space for the development of innovative projects.

Likewise, from a scientific point of view, I have not been able to identify literature that validates the thesis that designing a space inspired by the regions of the brain or its functioning, contributes in some way to fostering creativity.

In this way, much of the research, interconnection, and development work relies mainly on the managers' capacity to create methodological opportunities rather than on the ease of configuration and design and architecture serving such activities.

7.8. Ryerson university student learning center (Toronto, CA)

A socio and cultural space part of a teaching campus, "providing room for 2,300 students to study, collaborate and share ideas. It hosts impressive new facilities including a Digital Media Zone expansion, a Digital Media Experience hub and consolidated Student Learning Support programs" (Ryerson, 2015, p. 1).

Ryerson University has been named top undergraduate university for its research income over the last 15 years (Research info source 2016). Within its innovation projects is the DMZ, ranked as the first university business incubator in North America, which groups the largest number of innovative startups in Canada.

The projects of this university and the support they have given continuously to innovators in Canada, stand out as one of the centers par excellence to observe and to understand when studying spaces to promote innovation.

Located at 341 Yonge Street in Toronto, this 14,400-square-meter space has become one of the most outstanding meeting points of the city's academic community. It is a study site where one can find different learning social spaces divided into levels throughout the architecture of its new building.

Snøhetta & Zeidler Partnership Architects oversaw the elaboration of the architectonic project and internal spaces. Its construction began in May 2012, and the building opened its doors officially in February 2015.

Ziedler (2015) says that the social and learning areas used by the ancient Greeks inspired its creators. In these big "agoras," they would gather to exchange ideas and discuss different matters of the day.

Each area offers the necessary conditions for the students to develop different kinds of

interactions like idea exchanging or group studying, but it also offers controlled areas for an introspective study like independent study rooms, personal cubicles, individual tables, soft seat areas, and closed rooms for study groups.

This new project, with a total of eight generous stories, was thought to answer the need to build a library for the students and was conceived as a "Library without books." With a physical plant and an atmosphere specially designed for groups of people to be able to interact and meet naturally and spontaneously, as well as in an organized and planned manner.

Nowadays, it is called the 21st-century library, in which each corner and all of its space was created for the development of learning.Each floor has a different personality, from which the following stand out:

— Access: The access level or main access to the building is an open area that includes a Starbucks coffee shop, and on both sides, there are two sets of wooden bleachers with thin, green-colored cushions that allow students to sit and work.

  From this space, it is possible to access a series of staircases to all the other levels of the place, like an amphitheater, with digital signage, a touch screen kiosk and others.

— Sky Lounge: Located on the seventh level, which is the highest one, and projected as a studying area.

  In the sky level, the blue work tables and chairs usually look toward the large windows of the building, offering a beautiful view of Toronto, and through indirect lighting in the Loft concept, the meeting stage and learning of the students are promoted.

— Beach level: Found in the fifth or intermediate level of the building. The beach level is equipped with chairs, puffs and a blue- colored rug, and the possibility to sit on the floor allows people to establish work and collaboration meetings or to just study differently. It offers an unmatched view of the spectrum of the space, as well as rooms for group work, and rooms for closed seminars.

— Plaza level: The inferior level is where the internal scenography alludes to the place's theme.

Each level has a sense of unique communication that provides or adds identity, belonging, and works as a point for reminding and locating thanks to the themed design concepts proposed for each area.

Another important concept in the design was that the experience created for the students would help and encourage them to organize their own study time efficiently.

Said concept is complemented with the physical design and use of materials: the generous illumination, furnishings and accessories, the color-coded spaces that cue the different activities at each level of the building.

Also, the classrooms, workrooms, and video conference or seminar rooms in the fifth level stand out for their design and architecture.

Between the second and third level, an open design concept was generated for the administrative area and library. For Snøhetta[48] this space is strategically interconnected with different university campus areas, which gives total access to the building and creates a meeting point.

[48] Snøhetta. (2015). "Student Learning Center." *Student Learning Center Time-lapse Construction* 2012 – 2015. [Video] Accessed March 22, 2016. https://www.youtube.com/watch?v=XKyZ_VxQb2Y

The SLC provides students with the necessary technological resources for the healthy development of their academic activities. For examples, the DMZ or Digital Media Experience Suite is located on the third level. There, they can find the necessary equipment and software for project development and any kind of presentation.

This is a starting point that develops a whole permanent and collaborative virtual community with multiple possibilities and usefulness for the students (DMZ, 2015).

Considering the possibility of creating an SFI, this place stands out in its morphological configuration as well as in its characteristics and methodologies.

Particular attention has been paid to the details of interconnectedness between communities.

Appropriate spaces have been created for the development of ideas, ranging from prototypes to the start-up of projects, integrating both common and social areas with areas of education, research and business.

The spirit of the place favors the aptitude for innovation and only lacks adjustments of integration with the industry and connectivity with the local context. It could certainly be considered one of the cultural spaces better conceived to promote the same objective.

CHAPTER VIII

CONCLUSIONS

8.1. Findings

Throughout this "synthesis," I have identified not only different visions and points of view regarding the terminology associated with innovation, its spaces, and most relevant typologies. I have also had the opportunity to visit and compare these spaces, as well as interview their inhabitants and experts from different areas.

The study and observation incorporated scenarios of outsized proportions, as well as local models with limited budgets and spaces.

I also reviewed some internationally renowned spaces and those that are still being produced. These spaces gave a pretty comprehensive perspective on state of the art and the current situation of the existing ecosystem.

Several points turned out to be interesting while making this examination, for example, that the approach to the SFI has often been advanced from creativity, but has less in common with the definition of innovation.

In this final chapter, I intend to reflect on some relevant aspects I have identified, to design as well as to continue the research regarding what SFIs, or SFI, are and should be:

8.1.1. The concept of SFI is recent

The conscious reflecting and thinking required to create places that promote design and develop innovation have only gained attention in the past decade. Many of the places mentioned in this research were created from 2005 to 2015.

As we have identified previously, SFIs can find their origin in the Italian industrial districts according to Simmie (2005) and later in the British and German laboratories (Fagerberg, 2004), but definitely this growth phenomenon was mainly motivated by initiatives from the government, entrepreneurs, and North American industries. Therefore, the norms and rules of the design are a little diffused and hard to determine.

Many of the identified SFIs and SSFI are mainly related to entrepreneurship and innovations in computer technology, hardware, and especially software. This is due to the fact that a great part of the related literature, as well as most of the spaces, refer to these enterprises.

On the other hand, this trend does not exclude other types of industries related to social entrepreneurship, biotechnology, culture or design, but it shows how the technology sector of the American industry influences the development of spaces often related to it.

Nevertheless, these spaces will continue to evolve as exemplified by recently concluding projects and initiatives in the process of consolidation.

From innovation districts in Miami to collaborative innovation centers in Rotterdam, each one is proposed as the new “great thing” that will support the development of local economies. Therefore, we must consider technological innovation and, more recently, new design business models as a consolidated reality.

8.1.2. California is the current epicenter of SFIs

The areas of San Francisco, Palo Alto, and the campus around the Stanford University are in this epicenter.

If we had to choose the place where the recent SFIs began to hatch and grow, this region of the United States would be in the middle of the action, sharing its role closely with the city of Boston.

All this triggered the use of new spaces associated with innovation, such as the use of garages that turned into promising ventures, concentrating an essential number of technology innovators such as Steve Jobs, or the origin of co-working spaces movement by Brand Neuberg, as well as the promotion of the Maker fairs by Dale Dougherty, among others.

Thanks to the creation of the first research park in the world (Stanford Research Park) in the 1950s, the entrepreneur community, industries, and innovators began to colonize the vicinity, laying the foundation for what we now know as the Silicon Valley.

This knowledge exchange and the gathering of different innovators also made room in the region for the creation of the talks about technology, entertainment, and design (TED).

Recently, it has also promoted the creation and diffusion of the D. school model as well as the colonization of macro corporate campuses by Apple and Google in the region.

8.1.3. The role of university entrepreneurship centers incubators and accelerators is decisive.

If we analyze what has happened with the spaces oriented toward the development and promotion of innovation, especially the ones that refer to the third and fourth wave

mentioned by Scott (2012), we can identify business accelerators as great promoters of said spaces.

One way to track the origins of innovation may be through its archeological approach, evaluating its "vestiges," understanding its history through the "excavation" of sites, the analysis of "artifacts" and other "physical remainders" such as their edifications.

Initially, the Martin Trust Center for MIT Entrepreneurship, and hence proposals inspired by working models with enterprises and collaborative development, such as those raised by the Cambridge Collaborative Innovation Center, Masschallenge, and recently the Harvard innovation lab and the StartX Stanford, are those that have originated a high number of relevant ventures in innovation in the past few decades, and with them comes the rise of physical spaces for it.

However, what is most interesting about these places is that, in general, they promote the development of projects (mainly technology-oriented) without receiving any direct economic retribution for their support.

This cooperative/collaborative and social model has proved to be very appreciated and highly successful in terms of entrepreneurship, as well as in terms of space configuration.

Nowadays SFI and their research transcends the frontiers of the United States, going back to Europe and colonizing Asia, where we can find new proposals on the forefront, generated in collaboration with American entities or their own initiatives like the Innovation Tower in Hong Kong.

But both Palo Alto and Boston are considered territories associated with the source of said spaces and the relationship with them is reciprocal to the point that several projects from Boston were undertaken in California and vice versa.

Cities and the contexts around them play a decisive role, and are the key promoters of enabling SFIs as they mix quality of life, space, culture, economy in direct relationship of academia with industry and government, creating unique and differentiated "hotbeds" that favor the creation of SFI.

8.1.4. Collaboration is the key aspect of SFI

In this research, I have emphasized the importance of collaboration as part of the innovation process. With each in situ visit and each space researched, from its architecture to its literature, the common denominator was collaboration.

In order to talk about SFIs, it is then imperative that there be an intentional design of spaces for collaboration. This cannot be the one and only aspect in the process of designing spaces of this nature, but it is a relevant characteristic aspect of their design.

In the same way, the space for work and insolation from any kind of disruption also became relevant.

For this reason, the balance between individual workspaces and the design of areas of collaboration mixed with an environment that promotes planned and spontaneous encounters, looking to increase the bump rate, must occur in the design of SFIs as one of its unquestionable features.

8.1.5. Open design laboratories

As opposed to the open office system that in some scenarios could become disruptive, new spaces have emerged as integral solutions, mixing the concept of open and closed spaces.

Open design today is more flexible, allowing spaces to be closed or opened according to their needs.

Therefore, it is not strange to find that previously confined spaces, such as laboratories using fixed walls and objects, today re-emerge as a semi-Flexible option in which lights, connectors, equipment, walls and tables can be moved and rearranged according to the user needs.

This new controlled flexibility allows these spaces to maintain their essential characteristics without losing the opportunity to reorder their components.

8.1.6. We project creative spaces, but not spaces to innovate

There has been a problem when it comes to designing SFIs, namely the inexperience of designers and architects regarding innovation management processes, making them focus more on proposing creative spaces than places to promote the different stages that involve the innovation processes.

For example, Peschl and Fundneider (2012) suggest that the interior design of the spaces must be characterized by a relaxed and non-hierarchical environment that allows the free flow of knowledge." They also suggest that we must let users play like children by offering an environment that balances trust, openness, and minimum norms without many limitations.

On the other hand, the Stanford Design Thinking model is based on a five-step development of innovation process: assess, define, ideate, prototype, and test.

The problem is that architects and space designers usually understand the process as going from idea to testing and delivering the model or prototype, since the academic

background of most of them concentrate on the creative side and is far from the understanding of management models and business momentum.

Launching the product to market and moving from theory to practice seems not to be considered a priority in the architects' and designers' education, as they tend to solve the projects creatively, but not to implement them in the market.

Therefore, they appear to design more spaces to generate ideas (creativity), but the chance to design spaces oriented to capture the value of the project, somehow fades into the background.

Also, in the planning of SFIs it seems that some designers and architects were more motivated to develop solutions in terms of art, aesthetics, and physical function, addressing the creative profile described by Dyer, Gregersen, and Christensen (2013) rather than the delivery one.

This is relevant in planning SFIs, because previously identified projects in this research failed to integrate both profiles.

In other words, designers and architects are excellent at creating spaces to promote and stimulate creativity, for them to be fun, unique, colorful; but they are not reliable in creating spaces for business development, and promotion, as well as the relationships needed between them.

To summarize most of the authors I have identified as researchers and creators of SFIs come from a training background as creatives and not from business management or the like. This could be the reason why until today studies have focused more on assessing and proposing spaces for creativity and not for innovation.

8.1.7. Coffee could represent USD 421 of ROI

"Drink environments are migrating from the back-room pantry to the center of the office. 'They are becoming a new focal point, the oasis of the business environment' (Miller, 2014, para. 15). Unfortunately, I have noticed that little attention is given to this phenomenon in the literature and recent research. It should be thoroughly analyzed to surpass, imitate, or improve the SFIs design.

It is not as easy to calculate the number of cups of coffee that have been drunk and exchanged in a day in the SFIs, but as a reference, in the Cambridge innovation center, 20,926 cups of coffee are served in a month, while having 7,368 meetings in the same period of time (CIC, 2016).

Thus, we could say that 2.84 cups of coffee are consumed at every meeting, and if we add that this space has raised more than $1.8 trillion in its approximately 204 months of existence to date, each cup of coffee in a facility of this nature is about $421 return on investment (ROI).

To illustrate the phenomenon of coffee in this document, I have highlighted its importance as well as its relevance in the innovation process as seen in Micek (2015).

Coffee is also used as an excuse in different events of innovation like the ones organized by Burke and Sheldon (2010), in laboratory spaces by Lewis and Moultrie (2005), in private spaces by Forsyth and Crewe (2006), even identifying that most of the workspaces are designed primordially as coffee shops as mentioned by Leforestier (2009)

Also, coffee culture has been identified as a motive to reason and reflection, thoughts, and innovation sources for Schaeffer (2014), as spaces that connect and generate innovation for Rodriguez, Congdon and Ampelas (2015) and by O'Donnell (2012), as a means of learning as stated by the JISC (2006).

Coffee places are widely recognized for favoring proximity as a potential component of innovation for Fayard and Weeks (2011), is a crucial element in the creation of spaces for collaborative work and Innovation for Surman (2011) is an element to change the state of mind in an office for Jain, Kim, Marawar, Patel, Saso, Sheetz, Sini, and Yu. (2015).

And finally, coffee is recognized in business development by De Ruyter and Aarts (2004), in I-Lab spaces for Bulfinch (2011), creating unexpected connections for the development of cities for Cohendet, Grandadam, and Simon (2010), for promoting collective learning processes by Simmie (2005) and even in the transmission of new ideas that configure innovation districts by Pyke, Becattini, and Sengenbeger (1990).

The coffee culture is demonstratively essential in the development of a space for innovation. Not having a well-designed area or not being well structured around said space might make a fundamental difference in the social dynamics of these spaces.

The virtual SFIs are far from providing an interaction face-to-face, compared with the possibility of a meeting with coffee.

Toker (2004) mentions that face-to-face consultations formed the primary medium of information exchange among scientists indicating that an overwhelming majority (80%) of consultations occurred through deprogrammed encounters 'unscheduled office visits and coincidental consultations' (p. 122).

There are SFI like Boston's innovation district, with its venture cafe foundation, which seems inspired by the 'Starbucks style' that is specially designed and equipped with every convenience to promote new places to generate innovations.

I realized that in the most innovative environments, coffee spots create opportunities for interaction that allow cross-pollination of ideas, exchange of knowledge, and promotes the

development of new opportunities.

The coffee room is a source of reflection and thoughts that could support innovations, relaxation, reasoning, team spirit, and safety. Coffee as a place gives a home feeling, since it acts as an operational base for the team and provides a feeling of safety. Coffee makes us feel safe, and it is an opportunity area 'to talk about your work or other subjects' (Schaeffer, 2014, p. 87).

Almost every SFI that is considered successful as measured in terms of the business volume has been shown to have a valuable space for coffee as a part of their designs.

That is why every cup of coffee you share in a good SFI could represent USD 421 dollars of ROI.

Learning coffees are now successfully found in many institutions. 'The deliberate mixture of sodas, social activities, and creation of a relaxing and comfortable place for conversation and social interaction are seen as an essential part of learning' (JISC, 2006, p. 9).

For example, Boston's District Hall—Boston's First Public Innovation center—is a hybrid space where a coffee shop turns into the axis of innovation convergence by expanding the potential of sustaining both formal and informal conversation about projects.

As repeatedly mentioned in this research, these particular areas and the extensive culture of coffee create conducive environments to stimulate innovation.

Therefore, they should not be underestimated. On the contrary, they should be strategically placed and designed with the intention of promoting casual encounters, connections, and a favorable environment for innovation.

8.1.8. Terminological confusion

There is confusion in terminology that this research attempted to resolve. Several terms and definitions in the classification and naming of SFIs have been extrapolated, mixed or not well defined. For example, there is confusion around the concrete definition of corporate research centers and research parks, as they are frequently associated with the same functions.

FabLabs, for example, are not laboratories, but maker spaces. The fact that they are named in one way or another does not define them as such.

The same issue arises with I-labs that are associated with different names and typologies.

The confusion in identifying what could be named an I-Lab or not is evident, because users or creators may not be familiar with what an SFI is due to a lack of previous research on the subject.

The difficulty in understanding what an I-Lab is (without it really being one) has extended to a point where, as an example, even a bank's corporate sector misuses the name. The Visa Innovation Center in Silicon Valley[49], as well as the Commonwealth Bank and Innovation LAB[50], could both be examples of the naming confusion.

For this reason, in this research I have established the minimum characteristics that let you know if we are referring to an I-Lab or an I-Room and I have attempted to separate and delineate these terms more concretely.

Also in the definition of LSCI, or local spaces of collaborative innovation proposed by Capdevila (2013), he classifies SFIs on the assumption that there are some of them in which

[49] 10,405 square meters of development and client interaction
[50] Bringing clients closer and exploring SFIs in over 929 square meters

innovation may not be collaborative.

Throughout my research, I have argued the importance and the essence of the collaborative principle of innovation and the extreme difficulty in identifying an innovation which hasn't been collaborative, seeing as innovation always requires collaboration. For this reason, I do not use the term “local spaces of collaborative innovation,” because it is redundant.

And I have identified and classified these spaces and named them, dividing them into open Business co-working spaces, Living Labs, FabLabs, Makerspaces, Hackerspaces, and more.

8.1.9. How do they look like?

Regarding its distribution and physical appearance, Hillen and Camacho (2015) suggest that spaces of creation, even if they look unstructured, are usually divided into nine main areas which are: workshops, brainstorming room, project spaces, libraries, leisure spaces, materials cellar, kitchen, a small living room, and a Zen space.

After visiting and analyzing a significant number of places, I have identified three trends in SFIs and RFIs.

The first consists in creating fun, lively, colorful alternatives and designs. The second focuses on more modern-looking spaces that are structured and where the space distribution patterns are more “conventional,” and the third is some sort of hybrid between the first two.

In every case, the dominant idea is not absolute. Thus, in one space we can find something from each trend, adding more or less luxury, technology, or budget. Nevertheless, in my observation, one characteristic prevailed over the others.

Recent spaces have forefront architectures, whether they are remodeling an existing structure or starting from scratch. Usually they have been carefully designed, looking for innovations in the way they are presented and marketed. Their common denominator is that they are promoted as SFI.

a. Fun

The first trend is ruled by the concept of Fun. When we visit these environments, we cannot stop thinking of being in some sort of "kindergarten," where we can release our inner child.

Regarding the concept of fun, Wycoff and Lynn (1999) state that through play you can break barriers and inhibitions that keep us "in the box," and it is important to have beanbag chairs, toys, graphic elements that activate our ability for fun in the place.

This trend is most frequently associated in I-labs, I-rooms, gathering spaces, single and huddle rooms, but it also extends to thresholds, transition spaces, and some workshops.

b. Structured

The second trend is the one I denominate as structured, where the atmosphere is more like a conventional business environment or a learning center.

The feeling in these places is more "adult," but with a messy touch, subtle enough for it not to be considered a Fun space, but not so subtle as to think that we are in a rigid place.

Typically, in the design of these environments, architects and designers pay

particular attention to flexibility and stronger parameters of organization, discipline, and collaboration.

Some of them appear to be spaces of controlled chaos. We see them often represented in working rooms, innovation districts, learning and teaching campuses, GBPFs, research centers, co-working spaces, innovation towers, and labs.

c. Balanced

A third trend could be considered a kind of hybrid design between the previous two. Here it is difficult to determine whether they are one or the other, for they mix structured areas with fun areas in some sort of functional equilibrium.

Usually, corporate campuses, innovation habitats, social and cultural spaces, and some collaborative spaces tend to look this way

What draws attention is that when identifying these trends, usually spaces that are perceived as crazier, fun, messy, different, and distorted do not usually share the results of their rate of innovations and projects. This makes it harder to measure their impact.

On the other side, more structured spaces tend to exhibit or share their achievements proudly.

Even though the playful or fun areas and spaces have gained popularity, it is perceived that they are being used more in aspects related to creative moments.

In light of this research, I cannot state that the different spaces that offer promising interactions with their users, such as artificial grass rugs, ball pits, slides, high ceilings, colors, Zen zones can be more efficient than the others. Just as I cannot ensure that more

adult spaces, serious, or “once-too-stiff” better fulfill these objectives.

At this point, the possibility of the “fun” trend applied to spaces at a particular level or as a general strategy is open to discussion.

8.1.10. Learning and teaching environments are evolving

In recent years, we have seen the constant evolution in the design of architectural spaces. In my research, I have noticed that learning and teaching spaces have had an intensive design process and are devoted to a professor’s instructions, evolving to defy traditional models and providing flexibility.

Cases like the 4,304 m² Neushoorn in The Netherlands designed by DP6 Architectuurstudio + 3TO architects in 2016, or the Bergeron Center for Engineering Excellence in North York, ON, Canada by ZAS Architects in 2015 with approximately 15,800 m² and even the 3,000 m² Waltham Forest College in London UK by Platform 5 + Richard Hopkinson Architects in 2014, are just some examples of this process.

Today we can redefine this environment as dynamic places, where bright and open spaces take the place of traditional classrooms and laboratories. Campuses are designed to promote new ways of learning and to adapt and encourage innovation in relation to the context.

This gives students the possibility to interact in active learning classrooms, where seats can be arranged in any way and the learning tools can include more audiovisual options in flexible rooms with added technologies, such as conventional and interactive boards, among others.

Sometimes they focus on preserving antique buildings and their atmosphere, and, at the

same time, modernizing them to become the platform to raise the next generations of innovators.

Currently, we can find specialized spaces that facilitate cross-pollination of ideas between students and professors, thus integrating them in entrepreneurial, collaborative, and creative centers.

In these centers, conference rooms, classrooms, and offices seek to maintain an active academic community focused on learning through the optimization of its spaces that emphatically look for spontaneous interaction between students through the creation of carefully integrated social spaces [51].

8.1.11. Technology cannot be neglected

In many of the spaces visited, a common factor is technology as it relates to communication, interaction, data transmission and storage, for the development of the innovative process.

With the increasing use of the internet of things, space is merged with technology, and new tools are integrated into its ecosystem.

The use of cloud-based systems, small devices (such as tablets), touch screens, 3D printers, robots, among others, are replacing traditional tools (such as paper), enhancing the spaces to better respond to the new challenges of innovation. This trend is quite remarkable in most of the spaces visited.

[51] One example is the Ryerson University Student Learning Center in Toronto, ON, Canada by Zeidler Partnership Architects, Snøhetta

Recent studies confirm this trend, arguing that technology is used in SFIs mainly as a collaboration and communication tool, as well as a display and showcase tool (Wagner and Watch 2017).

Technology and interconnectivity play a fundamental role in the design of SFIs. However, the complexity presented by virtual space requires additional research not covered by this thesis.

8.2. Suggestions to design SFIs

8.2.1. Three contexts to consider in the SFI

The three contexts one should consider in all SFIs are: the creative zone or where creativity is promoted, the delivery zone or where business is prepared, and the meeting zone, where creativity meets business.

Throughout this research, I have mentioned how economic models and innovator characteristics have been widely discussed by Dyer, Gregersen, and Christensen (2013). For over six years they have tried to uncover the "secret ingredient" to business success, searching the minds of entrepreneurs such as Steve Jobs, Jeff Bezos, and Pierre Omidyar, among others.

As I recall, one of the most important discoveries refers to the innovative team profiles.

In examining how their work facilitates the innovation process, they conclude that there is a profile with delivery aptitudes or those who are "Delivery driven" and another profile with aptitudes for discovering, which I identify as "creative driven" in this research.

We could say that the goal of an SFI consists of becoming the ideal playing field for these profiles who have the objective of scoring touchdowns (innovations), without refuting Read (1958) who suggested that there are numerous people and "anonymous" profiles involved in the process, without which the goal could not be reached.

What is need is a quarterback like Steve Jobs who have the vision and propose the master plays to their teams, but we also need the "Wozniak" or the "Jonathan Ive" who receive and manage the balls, passing the ball needed until the touchdown line (innovations). Therefore, an SFI must contemplate the following zones:

a. Creative Zone

The Jobs' space, where ideas are incubated and visions released, is an area dedicated to the development of projects, products, and ideas.

The creative zone provides all the analysis, sensitization, and market research tools needed for their participants to formulate visions and to act as the creative or quarterback of the game and according to Amabile, Conti, Heather, Lazenby and Herron (1996) to promote the management of creativity fostering mutual aperture of constructive ideas and shared commitment to the project.

This is the area of the garages, workshops, prototyping rooms, design, invention and research spaces. It is the zone of laboratories, prototypes, field trials, rehearsal rooms, the Maker area, patents and records, laboratory tests and trials, the area of usability testing, the areas of design and visual thinking and the different methodologies that allow creatives to identify, define, and prototype ideas that lead to success.

b. Delivery zone

This is the Wozniak, Ive, McKenna space, where prototypes turn into innovations.

This zone must be designed to get the prototype to reach the market in the shortest time, thus capturing the most significant value possible.

This is the space for those who achieve, the executors, those who work to make the project reach the market.

It is also the zone of the spaces for investment, money, angel investors, and markets. It is the zone of platforms and diffusion spaces, legal and financial areas, lobbyists and diffusers. It is also the zone of shops, retail, the online sales and distribution, among others. This area should encourage and facilitate real stock market launch, rather than tuning, as mentioned by Diana Kander[52]

This is the area where we must act, the area that can accelerate the project to reach the market faster, and the zone that favors, promotes, and achieves results.

c. Meeting zone

This is the area where creativity meets business, and it is the most complex zone, because it is in charge of integrating two apparently distinct and distant worlds.

Doorley and Witthoft (2011) confirm the importance of promoting the collaboration of individuals from different disciplines and how these make the difference between what is conventional and what is an innovation.

Therefore, it is the zone of portals that take to the unknown dimension of business, the "bump rate" zone in which the "Jobs," the "Wozniaks," and the "McKennas" come together.

[52] Kander, Diana. (2014, Aug 27). "TED Talks." *Our Approach to Innovation Is Dead Wrong.* http://tedxtalks.ted.com/video/Our-Approach-to-Innovation-Is-D.

> This is the space where meetings happen, the zone of swapping spaces[53] cafes, theaters, kitchens, shared rooms, halls, events, laboratory area of mixed uses, fairs, business areas, runners, transitions and gray areas.
>
> In this area, spaces meet and coexist; it is the zone where the transition is made; it is the place on the field where the ball is passed to score.
>
> It is important to note that these areas are not fixed, their borders are not explicitly defined and they are otherwise flexible and demonstrate wide adaptability and transformation.
>
> They have an organic behavior, where one space can be in the creative zone today, it can then move to the meetings zone or turn into it, while another space can be in the Delivery zone and then the meeting one. Therefore, the mutations of spaces within zones and their versatility are crucial at the moment of conceiving their design.

Likewise, Fixson, Seidel, and Bailey (2015) confirm that the creation of design zones in business schools is a reality. However, the creation of business areas in design areas does not seem to have occurred to the same extent.

The CIC, for example, has within its scenario all three zones, and it brings a great number of innovations to the market. While the innovation rooms of some projects contemplate one or two out of these three zones, they sometimes become isolated spaces for creativity, where ideas can be born, but do not quickly find the fertile ground to germinate and grow.

In conclusion, an excellent SFI, regardless of its size, scale or budget, should consider these

[53] Spaces that change among themselves

three areas to increase the potential for results.

8.2.2. Boost the kitchen

Toker (2004) mentions that similarly, high visibility common spaces increase chances for catching eye contact with fellow scientists passing-by, which facilitates discussions Kitchens have a special relevance due to the culinary culture boom of the last decade.

A significant percentage of SFIs have one of these places located relatively near to their laboratories, meeting rooms, offices, and in some cases, they are even integrated into an open concept in Fun rooms and innovation halls.

Wycoff and Lynn (1999) suggest creating an atmosphere that provides a sense of the abundance of the place, either by providing food and work items to communicate generosity and solidarity, which promotes collaboration.

In spaces like CIC, the kitchen is considered one of the most popular places, and it is a preferred environment for encounters because it favors random information exchanges among members who do not necessarily connect with each often, but they found the lunchtime as the ideal pretext to generate new "sparks"

Its design in the configuration of SFI could be more valued by architects, because with the trend of open collaborative spaces, users demand a new meeting and working place, not only in big corporations, but also in universities and companies from the private sector.

8.2.3. Include takeoff spaces

Using the I-shower as a space for takeoff ideas is highly advisable.

Some SFI tends to be disruptive, even though some of them are designed as places where

specific behavior patterns must be followed or are spaces to have isolated meetings[54]. For example, due to their collaborative and open vocation, co-working centers, laboratories, transition zones, corporate and learning campuses, and even innovation rooms are places that can become highly disruptive, interrupting the concentration of those using it.

In many cases, university campuses also tend to be chaotic. Other places like research laboratories can be too silent. Therefore, finding places to obtain 10 minutes of focus either aloud or quietly, is more than desirable.

The aperture concept that many new spaces are proposing is widely accepted and positive, but at the same time it generates concerns. Leforestier (2009) argues that the lack of privacy and sense of disruption present in many of them is a weakness, and it even compromises confidentiality and safety aspects, as well as the sense of belonging.

Through interviewing different types of innovators about the ideal space for innovation some say, "I rather prefer my office space in the design school, for it is relaxed and silent"[55]. Others appreciate more calmness and isolation and mention that "most of the time I have many ideas when I sleep, then I get up and draw them"[56]

In this research, I have highlighted several architectural projects and spaces that promote collaborative work as a base for innovation, but we must not disparage or stop emphasizing that there is also a need for spaces that favors concentration and individual work, whether it is to assist the generation of ideas, the discussion of them, or to incite to

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[54] "We want the people to be fine and relax in this way we have better results, if you see in every floor we have a kitchen and a room for entertainment and relax environment with games, and things for the people" (extracted from the interview with Berlin 2014)

[55] (2014 November 08). *Interview with Wang Gang about the best space for innovation as Director of Product design department College of Design Arts and Apparel Engineering Xiamen University of Technology*, Xiamen

[56] (2014, November 08). *Interview with Jinsoo Park about spaces for innovation as Director of Cube design*, Xiamen.

reflection and encourage concentration to stimulate the rise of new opportunities.

For example, the level of disruption experienced in a space like the Innovation Gym in Tec de Monterrey is high for conducting meetings, even though it comes with structures and divisions that allow a certain level of privacy.

This is because, from its meeting rooms to the sparring area, an open concept dominates and it becomes hard to carry out a simultaneous meeting without having some other occupant's concentration disrupted.

The distribution and selection of areas as well as the creation of suitable areas for individual work was a weakness that became evident, even with sound insulation.

However, this was not the only place that showed such shortcomings. Something similar happened in the District Hall of Boston, although at a lower level, and in other areas visited such as Neurocity in Manizales, among others.

Thus, in contraposition to the open and jovial character of some spaces, there must exist balanced elements that are different from traditional meeting rooms.

The innovators who were interviewed really appreciated having spaces like touchdown spaces that do not require previous reservations. They are more of a "first come, first served type" to isolate themselves temporarily—not to rest like Zen spaces—but to be able to find isolation to land their ideas.

For now, the only option they found was to plug into their audio devices and focus on their screens.

However, considering that the SFI seek to promote the collaborative spirit of the participants, a poorly design space could generate exactly the opposite effect.

It is hard to believe that it is feasible to have an animated conversation in these spaces without feeling as if you are inconveniencing the rest of the occupants of the place. Regarding this point, we prefer spontaneously closed spaces like the ones that motivate us to express ideas, and allow us to isolate ourselves and work with autonomy at certain times.

A solution to this was raised in the innovation lab of Puebla, where I-showers were proposed as key elements to complete the structure of the place.

The I-showers are spaces where one can isolate him or herself in an individual way, as well as in couples or mini groups, inviting us to reflect, relax, and concentrate in an active mode, and usually we leave the spaces with plans, ideas, or sensations that increase our results and productivity.

Something similar to the I-showers can be found at the Google Campus in London which was designed by Jump Studios.

Therefore, just like SFI promote open spaces where one is exposed to socialization, closed spaces for concentrating on the creation are fundamental.

Producing intimate spaces of creation, in which one can be alone or in small groups, provides a perfect opportunity to seek tranquility and disconnect from the world. They also tend to generate new ideas and therefore they should be considered as Takeoff spaces.

In visiting different innovation places, none of them had these takeoff spaces, as previously described.

Conversely, there were small meeting rooms that could be used for this purpose, but not specifically designed and intended as such.

8.2.4. Promote Medici effects

Stimulating interdisciplinary integration is key, since innovation processes are not one-dimensional, but they are one of the more complex and sophisticated processes from the cognitive, epistemological, and social points of view we know (Peschl and Fundneider, 2014).

The possibility of finding or bringing together different people, with different backgrounds and knowledge in one place generates what Johansson (2004) identifies as the Medici effect.

During this study, it became evident that meeting or encounter spaces are fundamental, and are included from the design of innovation districts to civic innovation halls and small rooms.

Regarding this, Fichera[57] mentions how in the Boston District Hall, the pluri-disciplinary environment has turned into a priority, and has been the base of the place's design.

For them, it was absolutely necessary to bring together creators, business people, and institutions with different backgrounds and a cross-sectorial approach, looking to make them come together in the same place. For example, having entrepreneurs from the robotic industry interact with the ones from the fashion industry may generate new project possibilities.

They even seek to replicate Medici effects in the houses they projected for innovators, designing public spaces that invite the user to the encounter.

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[57] (2014, September 24). *Interview with Nicole Fichera about the space of the District hall as General Manager at The Venture Cafe Foundation*, Boston.

Also in the interview, Fichera[58] mentions that therefore, it is not uncommon for the Factory 63 lobby to offer free coffee, a co-working space that is always open, and the person who cares for the building, does not act as a security guard, but more of a community manager.

She stresses that people want to come to a space where they feel outside their company, and companies have a person in charge of looking for connections outside of their team, to walk out of their own bubble and meet others

Therefore, SFI, in addition to contemplating "Medici encounter" places, meeting areas, didactic rooms, halls, must be attractive enough for everyone to want to get to them.

Architecture and design are, by themselves, capable of providing and encouraging the creation of spaces that generate the casual encounters that Fayard and Weeks (2011) and Toker and Gray (2008) mention, or the exchange promoted by Johansson (2004) and Johnson (2010).

Some are more attracted by the potential for networking, while others are intrigued by the idea of feeling outside of their usual working place, but whatever the reason, as creators of these spaces, it would be a mistake to let the people come into the place and keep acting in isolation, without exchanging information … without interacting.

While invention happens in the laboratory, design takes place in the workshop, creativity happens in meeting rooms, but innovation only comes when the project crosses the "Valley of Death," which Auerswald and Branscomb (2003) refer to, making the invention or product find an investor and reach the market.

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[58] (2014, September 24). *Interview with Nicole Fichera about the space of the District hall as General Manager at The Venture Cafe Foundation*, Boston.

Therefore, Medici areas must be planned to make magic from investment to action.

8.2.5. Make it flexible

The innovation environment changes continuously, and that is how today's structures must be conceived. In any other way, a rigid or semi-rigid scheme leaves few options for interaction, and therefore limits growth and collaboration scenarios.

At present, it is difficult to identify or consider a SFI that is not designed flexibly.

The characteristics of modularity, flexibility, and scalability, no matter the dimensions of the structure, like the Google's corporate macro campus with its 457,200 square meters, validates this idea, and it is one of the priorities exposed by its architects, with the aim of hosting 20,000 people that will evolve with time.

We can find another example in the Ryerson University Student Learning Center, where the space, despite its great scale, allows for spatial transformation and incites interaction.

This concept is present not only in great contexts and corporate campus, but even in I-rooms.

It is common to find mobile walls and changing structures within them, as well as spaces with the possibility to adapt configurations depending on the situation.

By comparison, spaces like NEUROCITY (Manizales, COL), even though they showed to be interesting ideas, exposed their weaknesses in this sense, showing themselves as more prone to obsolescence, with an inflexible design that limits the possibilities for scalability, diversification, and usage.

The message for architects and designers is clear. Project spaces should be easy to use and configurable for multiple functions, because in SFI, the more adaptable and flexible… the best!

8.2.6. Make it functional

Within the environments and spaces visited, a common characteristic was noted: Form follows function!

This principle, coined by the famous architect Louis Sullivan, and promoted by the German school Bauhaus in 1919 marked the time in which functionalism with a practical beauty was valued above non-functional beauty.

Today, this concept is reedited and adopted by the SFI, and is proposed as providing some sort of equilibrium between function and beauty, under the premise that if it is beautiful but it doesn't work, it cannot be considered a SFI.

The form of its structures, support elements, and spaces working together determines functionality. It consists in taking advantage of the space's characteristics, natural light, implementing sustainable models that are socially and highly efficient, where the spatial configuration is very present, no matter the scale.

Per Wycoff and Lynn (1999), designing a space that is pleasing to the eye and the senses with the aim of stimulating the thoughts, as well as active and pleasant collaboration of the individuals is important, but it is not fundamental.

Creating a dysfunctional space, where flexibility, meeting areas, and the elements that compose it are not highly functional, it seems ineffective in the SFI, since it tends to turn them into decorative places, beautiful and creative, but not necessarily useful in encouraging the innovation process.

SFI functionality encompasses not only morphological aspects but also the methodological, ranging from how they are used, as well as the activities defined in the same or even both methodologically and spatial reciprocity established between each of the spaces designed.

It is important for both architecture and design to meet their practical function, like for methodologies and models applied to spaces to work efficiently.

Two characteristics could contribute to their functional aspects:

a. Pose to Interaction[59]

In 2007, Doorley and Witthoft (2011) created four prototypes of meeting and posture spaces, in which they wanted to test the abilities of their students at the time of designing or discussing an idea.

The study demonstrated that those comfortably seated on couches were more empowered to criticize other's ideas, while vertical positions facilitated the exchange of ideas, putting them in an active position in comparison with the ones sitting back which were relaxed and mostly adopted critical postures.

Ferchowa[60] also agrees that promoting movement, and working in different bodily postures are essential in the configuration of SFI and I proved this designing the I-Lab Ibero Puebla

In this space, the furniture allows adopting different body postures (standing

[59] "Space for innovation is about sitting you need a seat really comfortable to sit, because if you have a long conversation you need a sit, so a comfortable place to sit is very important" (extracted from the interview with LKK, 2014,).

[60] (2014, December 10). *Interview with Ewelina Ferchowa*. About the space for innovation of the Tech of Monterrey as *the Career director and innovation developer of the Campus.* Monterrey

vertical, sedentary, and even horizontal) according to its methodological patterns.

That is how in CD&I Associates we created and projected tables with adjustable height in agreement with the methodological moment being lived.

For the stages of reflection and research, a sedentary position on the floor as well as low tables were suggested, while in the idea generation and prototype elaboration stage the height of tables could be raise and reorganize giving the possibility to create and exchange knowledge actively.

The results have demonstrated that the posture change in individuals positively favors the idea generation, and sometimes the memorization and internalization of the proposing methodologies taking place.

b. Signaling

Per Doorley and Witthoft (2011), the signaling plays a very important role in the space itself, for it not only allows and facilitates location, but also the relationship with members of the space in different manners.

For Wycoff and Lynn (1999) it is imperative to have the right tools immediately available in the space, such as boards, elements of collaborative work, machinery, software conforming to the circumstances and projects being developed within it

Within signaling aspects, it must be considered that there are more possibilities than naming the rooms, places, bathrooms, and there is also the possibility to create informative walls as an element that allows communicating the access to the spaces and many other aspects.

Infographic signaling allows the user to locate the key elements of a place rapidly and

to concentrate its attention on them.

As in the case of the Ryerson University Student Learning Center, other types of signaling and pathways have been applied to SFI, like creating themed floors where not only the signals, but also the colors, textures, and other elements turn into information sources that guide the inhabitants, giving them a sense of belonging and safety.

8.2.7. Make it meaningful

Form and function are important, but meaning adds unique identity values to the context.

Over my different visits to the SFIs, one characteristic stood out: the way in which each one tried to project its identity, making their users feel attracted or identified. Each space seeks to project an emotional charge, not just the logic and function of their design.

From the Innovation Tower in Hong Kong to the DF of Palo Alto University or Apple's new macro corporate campus, one of the obvious intentions of architects and designers consists in projecting the sensorial qualities of the space with the aim of communicating their identity and/or meaning.

Within the diversity of proposals, two strategies particularly stand out.

a. Through the physical shape

Shapes, textures, color, and materials used seek to communicate a sense of belonging and property to and from the space.

Sometimes they reflect the corporate culture of the organization, other times they

emphasize the historical or archetypical referents of the place where they are, and still other times they create new references.

For example, in the Boston's innovation district, the boats and the piers inspired the architects who designed the innovation hall, giving it a harmonic integration with the design of the old factories that occupied the place.

The Design Factory spaces, in Aalto, include saunas as meeting places as a way of implementing Finnish culture values, and the D. schools in California began the trend of using red sofas in the spaces, something that today is part of the identity of many of the visited places.

b. Through rituals

For Doorley and Witthoft, (2011) creating small rituals helps transform a mundane activity into something that allows connection to the place and space.

For example, in the Innovation LAB of Ibero every person who enters this SFI must leave his/her shoes in a designated place, as a symbolic act of purification, transition, and mentality change, encouraging people to have a different attitude when they go inside.

Freeing oneself from shoes breaks merely certain rules and dress codes, thus making it fun to observe how everyone from executives to students change their behavior the moment they leave their footwear at the space entrance.

The creation of this ritual allows the participants to make a transition toward a new mood and work attitude. I have noticed that it makes them feel in a similar level of relationship and trust with everyone in the room.

Apparently, when an executive or a student take off their shoes in a creation hall, a feeling of informality and equality is created. In this equality, everyone is in the same mood to innovate.

8.2.8. Investors should be located 7 seconds away

According to Hillen and Camacho (2015), workshops for innovators should be found seven seconds away from the SFIs. Also, Doorley and Witthoft (2011) recognize the importance of the proximity of workshops to the working environment. For this reason, the venture capital firms, investors, lawyers, and every infrastructure required for the successful launching of an innovation should also be located no more than seven seconds away from the SFIs, or perhaps they should be a part of them.

In this regard, Niosi (2003) argues that to increase the success of innovation, venture capital firms should not only provide financial capacities, but force the innovators to improve their management capabilities and the opportunities to bring their projects to the market at a faster pace.

More importantly yet is to achieve the creation of fluid environments of exchange, in which experts from investing funds, angel investors, and crowd funders cohabit with the innovators, in the space I previously named the Delivery zone.

Within “ventures 7” workshops, we could work in the financial and investment model, receive the necessary feedback, and find the right people to finance our investment, a sort of “shark tank” within an SFI.

As stated by Kenney (1986), a fluid environment of venture capital and the ability of the company to exploit the resources of this environment are considered an important factor in the growth of SMEs.

Thus, as stated by Niosi (2003), without capital, there is no innovation. It requires a strong managing team to promote the quick success of businesses, along with a verifiable prototype and a good investor by your side.

In other words, without money, there may be creativity, but it is unlikely there will be innovation!

8.2.9. Beware of the creative approach

Several authors have expressed caution about the lack of integral and holistic approximations over the concept of innovation. Wang writes: "Theoretically, one stream of innovation research is primarily focused on the production of innovations, the other stream is mainly focused on the use of innovations. However, the two streams rarely converge to show the whole picture of innovation supply and demand, limiting the applicability and impacts of innovation theories" (2009, p. 2).

Keeley, Walters, Pikkel and Quinn (2013) remind us that almost every enterprise can produce pure innovation, usually related to I+D, marketing, or product development and highly sophisticated innovation typically does not fit within the typical organizational structure.

They also state that the most common mistake is to see executives that try to build an SFI assuming that both, sophisticated and straightforward, innovation can be achieved with the same system.

Meanwhile, Fixson, Seidel, and Bailey (2015) state that many innovation-learning methods through Design Thinking approach four big groups of activities:

— Analysis of the problematic: The project team tries to deeply understand the nature of the innovation problem, focusing on whether that is the objective they must work on.

— Understanding the user: It then focuses on human perspective, trying to understand the drive behind these needs.

— Ideation: Once the opportunity problem has been clearly articulated, a group of ideation activities is done to generate possible solutions.

— Prototyping: These activities seek to get to the creation of prototypes, where they are focused on working from a high number of possible options to the final solution. Although these groups of activities are presented in a sequence, in practice "there is a considerable iteration and overlap among them" (Fixson, Seidel, and Bailey, 2015, p. 6).

Therefore, it is important to exercise caution with the approach to spaces designed based on design thinking, and even higher caution with those that do not even contemplate this methodology, because one could only consider the creative aspect instead of the whole innovation process.

It is understandable for designers and architects, and even some managers, to be inspired by the previously mentioned stages to design SFIs (since it is part of their background). However, this could imply that in SFIs design, they will include spaces to work in this one, but not care as much about the complementary stages and fundamentals like fine-tuning, financing, market release, and significant re-engineering of the process.

Without all these there will not be proper innovation, as I have argued throughout this document. Therefore, as mentioned by Fixson, Seidel, and Bailey (2015), these design-centered activities are fundamental for the front end of any innovation process, but there

are additional elements that must be considered.

Contemplating every stage of the process and going further than the Design Thinking vision is imperative! Thus, we must involve other actors and key factors in the designing of these spaces (angel investors, financing sources specially designed for collaboration and exchange between creative and Delivery profiles, etc.).

8.3. Final remark

This study complements past research on the SFIs, or SFI, by Leonard-Barton and Swap (1999), Haner (2005), Lewis and Moultrie (2005), Allen and Henn (2007), Moultrie, Nilsson, Dissel, and Haner (2007), Fayard and Weeks (2011), Peschl and Fundneider (2012) Oksanen, Kaisa, and Ståhle (2013) Schaeffer (2014).

This "synthesis" took over two years of research, more than 145 bibliographical sources were thoroughly analyzed, 130 SFI were evaluated worldwide, 14 interviews in situ, nine cities visited (Toronto, Montreal, Miami, Puebla, Monterrey, Boston, New York, Manizales, Xiamen, and Hong Kong). Including the in situ analysis and report of 8 innovation representative places (I-Lab IDIT, Harvard Innovation Lab, Ryerson University Student Learning Center, Neurocity, Boston District Hall, Hong Kong Innovation Tower, Cambridge Collaborative Innovation Center, and Innovaction GYM), in 5 different countries (Canada, Mexico, USA, Colombia, and China), achieving to identify and classify 13 main SFIs typologies, 41 subcategories, 9 supporting elements, formulating 11 conclusions and 9 suggestions for the development of better SFI.

As I revised throughout this research, a common denominator is that there is not a fixed idea of innovation shared by the creators of SFIs. Also, these creators often confuse the terms idea, invention, creativity, and innovation.

Several of the spaces studied are inspired or based on models promoted by Design Thinking, and they are beginning to influence other identified spaces.

Even though SFIs began to emerge in the 1950s, the past decade has seen a genuine boom and a recent resurgence of the matter. Therefore, it is not rare for the SFIs ecosystem to keep changing, updating, and recomposing.

With this research, I have created a more precise way of classifying SFIs and I have included several aspects that allow us to understand the present scenario for these spaces.

In the future, new contexts, methodologies, and waves of innovators with new visions will be in charge of validating and reediting this proposal.

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