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**A Strategic Value Network analysis based on Entrepreneurial Ecosystem:
evidences from a multiple case study on the San Francisco area.**

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“He, who does not trust enough, will not be trusted.”

Lao Tzu, 531 b.c.

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ABSTRACT

The importance of the role of Entrepreneurial Ecosystems in the economic market is a matter broadly grasped in academic literature and its relevance is increasing in the last years due to the fact that they are growing and becoming every day complex and intertwined. Recent studies have pointed out the missing of a comprehensive theoretical framework concerning this Ecosystem typology, coupled with a lack of a clear understanding and analysis of the dynamics governing it. This confused situation encourages the research to further analyze entrepreneurs with a strategic perspective. The area of investigation concerns, thus, the study of innovative and digital entrepreneurial ecosystems, focusing on their strategic networks and on how they are able to generate value, through complex dynamic exchanges among their participants. More specifically, the entrepreneurial ecosystem may take advantage of a strategic representation and analysis that focuses on its structure and dynamics, while uncovering its value generation and potential value capture for the main actors involved. The research work is structured in two main sections: a critical literature review, focused on the streams of Strategic and Value Networks relevant for the theoretical comprehension of the analyzed field; and a consecutive empirical analysis, extrapolated by the investigation made in the first session, with the aim of giving a practical tool for evaluating strategic performances both at a firm-level and at a holistic ecosystem-level. The developed model is finally applied to the San Francisco bay area entrepreneurial ecosystem through the utilization of a multiple case study technique based on interviews of the principal Silicon Valley network's participants and on the gathering of qualitative data with the utilization of a Likert scale weighted on consensus. The principal outcomes this work concern a solid contribution to the strategic analysis of entrepreneurial ecosystems enhanced by the valuable analytical tool results able to give insights on the "value sustainability" of Ecosystems and, more in general, of Networks.

Keywords: Entrepreneurial Ecosystems, Strategic Networks, Value Networks, Startup Ecosystems, Business Model, Ecosystems

SOMMARIO

L'importanza del ruolo che l'ecosistema imprenditoriale ricopre in ambito economico è argomento ampiamente analizzato in letteratura e la sua rilevanza è da considerarsi in aumento negli ultimi anni. Studi recenti hanno sottolineato la mancanza di una completa struttura teorica riguardante gli ecosistemi imprenditoriali, unita ad una mancanza di una chiara analisi delle dinamiche che li governano. Questa situazione d'incertezza porta la ricerca ad una più dettagliata analisi di imprenditoria seguendo una prospettiva strategica. L'area di studio riguarda, quindi, l'analisi di ecosistemi imprenditoriali basati sull'innovazione; focalizzandosi sulle loro reti strategiche e su come, queste ultime, sono in grado di generare valore attraverso le complesse dinamiche degli scambi tra i loro partecipanti. In dettaglio, gli ecosistemi imprenditoriali potrebbero sfruttare una rappresentazione strategica ed un'analisi incentrata sulle loro strutture e dinamiche, rivelando il valore generato dall'ecosistema e potenzialmente catturato dai principali attori coinvolti. Il presente elaborato è suddiviso in due sezioni principali: una analisi critica della letteratura, basata sui filoni delle reti strategiche e del valore, indispensabile per comprendere a livello teorico l'argomento analizzato; ed una analisi empirica, derivante dal precedente studio, con l'obiettivo di offrire un pratico strumento in grado di valutare strategicamente le prestazioni dell'ecosistema intero e dei suoi singoli attori. Infine, il modello sviluppato è applicato al sistema imprenditoriale presente nell'area della baia di San Francisco, attraverso l'utilizzo di molteplici casi di studio basati su interviste effettuate ai principali attori della rete. I dati qualitativi sono estrapolati tramite l'utilizzo della tecnica della scala di Likert pesata sul consenso. I principali risultati della trattazione sono rappresentati da un significativo contributo all'analisi strategica degli ecosistemi imprenditoriali generato dai risultati raccolti attraverso lo strumento analitico sviluppato, e in grado di offrire preziosi spunti sulla "sostenibilità del valore" di ecosistemi e, più in generale, di reti.

Parole Chiave: *Ecosistema imprenditoriale, Rete strategica, Rete del valore, ecosistema startup, ecosistema, modello di business*

EXECUTIVE SUMMARY

AREA OF INVESTIGATION

In a period of general economic recession, several studies have highlighted that the only way to overcome it and to generate new opportunities, growth and employment is creating new businesses and innovate. In the light of this consideration, the work is focused on a strategic analysis of entrepreneurship and, especially, on entrepreneurial ecosystems. Even though, in the last decades, there is a common trend bringing researchers to focus on this field, there are still many literature gaps. Recent studies point out the missing of a complete theoretical framework of Entrepreneurial Ecosystem, coupled with a lack of a clear understanding and analysis of the dynamics governing it. Ecosystem entities must be viewed as a holistically rather than analyzed separately. More specifically, the entrepreneurial ecosystem may benefit from a strategic representation and analysis that focuses on its structure and dynamics, while uncovering its value generation and value capture potential for the key actors involved.

Given that, the area of investigation will be the study of entrepreneurial networks concerning “Digital Markets”, focusing on how they generate value, though complex dynamics exchanges between one or more enterprises, its customers, suppliers, strategic partners, and the community. Digital innovation is reshaping or even destroying many different sectors creating new ones (e.g. Mobile telephony is gradually merging with mobile computing). Since Digital innovation comes from Startup companies (Blanch,2012; Cumming & Macintosh, 2003; Graham, 2011), the Research stream will be focused on this field. Starting a new company has never been so easy as in Digital markets context, due to its low capital intensive nature; however, the majority of them still fail because of the lack of appropriate and up to date Entrepreneurial Strategy tools (Blank, 2013). The research focus will be on the dynamics and the structure of the ecosystem taking into consideration both the classic tangible exchanges both the innovative, but extremely valuable, intangibles with a Managerial and Strategic Approach. Our main objective will be achieved by modeling a reference framework on the Entrepreneurial

Ecosystem with particular reference to the role played by concepts and constructs based on the Value and Strategic Network theories.

The research aims at giving a clear idea of how a Startup ecosystem works summarizing the extant previous researches on Strategic networks and Value Networks, and offering a new interpretation based on the combination of the two frameworks in order to generate a model of qualitative/quantitative analysis on Entrepreneurial networks.

A deep understanding of the Entrepreneurial Ecosystem, and a clear overview both from a static and dynamic perspective could advance the past academic contribution at system level analysis. Integrating emerging theories with Strategic Network stream, can stimulate further academic research on entrepreneurship. Moreover, could be helpful for those scholars focused at firm level, by revisiting existing model and tools or introducing new and original one that can enable entrepreneurs to face with several actors and capturing value from the network.

Entrepreneurs and not only academics, will have to consider an “ecosystem perspective” or an “ecosystem value” in order to be prepared and able to capture the value the ecosystem generate. The network in which new venture are embedded in can directly or indirectly, positively or negatively, influence their business. In some cases, could be a “nice to have” perspective for them. In other cases, it is a “must to have” and so crucial for their business sustainability.

The present research aims could stimulate further research presenting a deep analysis of a specific reference network (e.g. industry specific network) considering incumbent company instead of new venture. The study presented can be considered valuable also for Managers and Consultant that are facing “the digital revolution”. A network perspective and a clear overview on dynamics related to the Entrepreneurial Ecosystem could help them, considering that they will be forced to catch new ideas, to innovate, compete and survive, from the (Digital) Entrepreneurial Ecosystem.

STATE OF THE ART AND KNOWLEDGE GAPS

Several and valuable academic contributes offer a clear explanation of a strategic relation (“Strategic Alliance”) between relevant actors operating within the Entrepreneurial Ecosystem, such as new venture and investors (VC firms) partners (Ozmel, U., Robinson, D. T., & Stuart, T. E.; 2013). Other contributes are focused on a specific actor, considering also the considerable Scholars’ attempt to introduce a systematic and networked perspective (Phan, P. H., Siegel, D. S., & Wright, M.; 2005; Bøllingtoft, A., & Ulhøi, J. P.; 2005). This pattern is considerably important for Entrepreneurship development due to its resource scarce environment and the increasing cooperative trend; by forming strategic alliances, entrepreneurs can, in fact, potentially access social, technical, and commercial competitive resources that normally require years of operating experience to acquire (Ahuja, 2000; Alvarez, Ireland, & Reuer, 2006; Garcia-Pont & Nohria, 2002) .

How to Build an entrepreneurial ecosystem is topic already examined, and valuable in particular for Policy Makers (Feldman, Francis, & Bercovitz, 2005; Isenberg, 2010; Pitelis, 2012). Cohen (B. Cohen, 2006) explores how components of the formal and informal network, physical infrastructure and culture within a community could contribute to a sustainable entrepreneurial ecosystem. Isenberg points out what are the main dimensions of the Entrepreneurial Ecosystem, and includes interesting suggestion direct to Policy makers. This vision goes beyond the company value chain and opens to a set of elements that must be managed holistically to sustain the ecosystem (Isenberg, 2010).

There were also attempts to present a static view (or perspective) of the Entrepreneurial Ecosystem as whole, with a systematic approach (Isenberg, 2010; Neck, Meyer, Cohen, & Corbett, 2004). The common purpose of these attempts to draw a common path for Entrepreneurship nurturing is to describe the ecosystem and to give clues on how to generate a self-sustaining environment (B. Cohen, 2006; Isenberg, 2010); however these are just a set of principles, generally based on the analysis of already existing ecosystems, that must be extended and structured.

Entrepreneurial networks

A “network-based” perspective is not new in entrepreneurship studies (Antoldi, Cerrato, & Depperu, 2011; Greve, 1994; Hoang & Antoncic, 2002; Minniti, 2004; Ulhøi, 2004), entrepreneurial networks are traditionally interpreted as:

- “*Content of network relationships, governance, and structure*” (Hoang & Antoncic, 2002);
- “*Social processes influencing founding rates and social structures facilitating entrepreneurship through mobilization of complementary assets*” (Greve, 1994);
- “*Social interactions and mechanisms*” (Ulhøi, 2004);
- “*A set of actors or nodes along with a set of ties of a specified type that link them*” (Borgatti & Halgin, 2011).

Several studies argue that entrepreneurship cannot be merely understood in terms of “personality characteristics” or in economic terms (Minniti, 2004; Ulhøi, 2004); to complement these analyses, a social dimension made of entrepreneurial networks must be considered.

In fact, researches on that field assert that economic activities are changing from dominantly stand-alone to networked and new perspectives are needed to study these relationships (Anggraeni, Hartigh, & Zegveld, 2007a).

In conclusion, many practitioners tackled the field of Entrepreneurship with a network approach; however, the literature lacks in a schematic approach concerning the strategic perspective of the field. Hence, a strategic interpretation of networks would be extremely beneficial.

Strategic network

The strategic network stream of research proposes a new way to understand the relations between a firm profitability and the structure of the Network around it.

The link between network and strategy was grasped only in the middle eighties, because the two concepts was coined in completely different fields but the attention on it raised considerably year by year giving to the literature a substantial amount of studies (Jarillo, 1988; Thorelli, 1986).

Historically, researchers have considered firms as completely autonomous entities, trying to gather a competitive advantage (Porter, 1980). However, due to the continuing increasing of exchanges and relationships between firms (M. Granovetter, 1985), the entire network of firms must be taken into consideration as a whole entity; otherwise the output of the analysis will not be complete and realistic.

While talking about Strategic Networks, many researchers focuses on “Alliances” between firms and, especially, on learning alliances, in which the primary objective of the partners is to learn from each other. (Baum et al., 2000; Garcia-Pont & Nohria, 2002; Gulati, 1995, 1998; Khanna, Gulati, & Nohria, 1998; Mody, 1993). These alliances/relationships between firms, generate a set of resources jointly owned by the partners called “Social capital” (Antoldi et al., 2011; Burt, 1992; Walker, Kogut, & Shan, 1997). This capital is a critical variable and is defined by Burt (Burt, 1992) “the final arbiter of competitive advantage”. Moreover, a study made by Shan, Walker, and Kogut (Walker et al., 1997) found that the number of collaborative relationship of a firm is positively related to its innovation output.

Several researches focuses on the structure of networks and how it influence the firm (Baum et al., 2000). The most proficient practitioner in this field is, with any doubts, Ranjay Gulati. His effort in structuring the network and the behaviors of each player among it, is remarkable, and the output of his researches is an effective framework that links the network with its firms’ performances.

Gulati reviewed a wide set of literature and highlights some key static behaviors in a network in order to draw a model:

- *focal firms*: companies to which all the other players of the network are connected with;
- *firm ties*: relationships between companies;
- *Structural holes*: connection gaps
- *Structural equivalences*: similarities among actors' activities that bring to duplicated information.

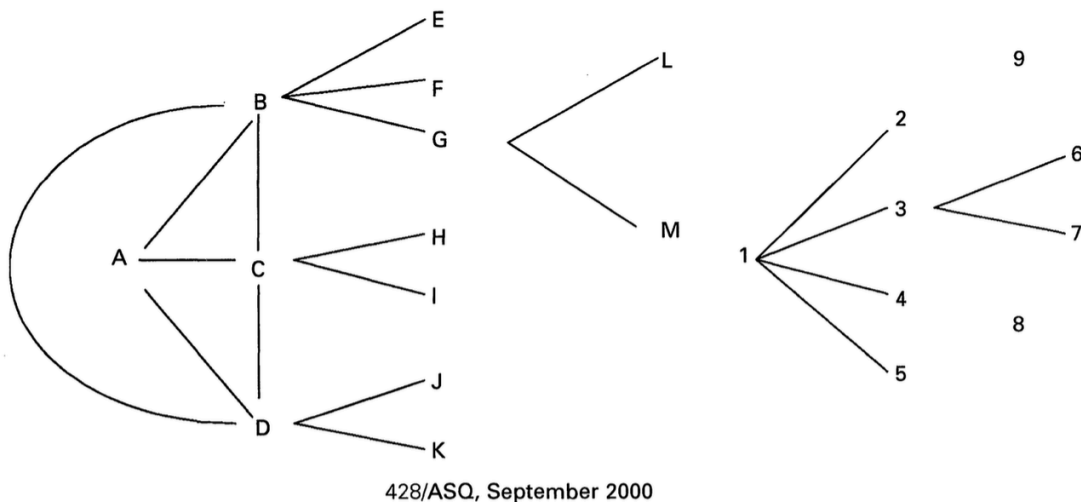


Fig.1: Example of ties and structural holes

Source: Ahuja, *Collaboration Networks, Structural Holes, and Innovation*, 2000, *Administrative Science Quarterly*

Many practitioners give more explanations on these phenomenon separately, in a more detailed way (Ahuja, 2000; Borgatti & Halgin, 2011; Burt, 1992; Friedkin, 1980; Walker et al., 1997).

Gulati, in *Strategic networks* (Gulati, Nohria, 2000), tries also to outline the challenging topic of dynamic behaviors among the network; bringing together the studies on lock-in lock-out effects (Baum et al., 2000), that analyze the consequences of being in an exchange relationship with other companies; and on learning races (Baum et al., 2000; W. Cohen & Levinthal, 1990; Khanna et al., 1998; Mody, 1993), that look at possible opportunistic behaviors due to a wrong balance between common and private benefits.

However, this dynamic approach, focused on the evolution of the network over the time, lacks in strong academic literature and, as a consequence, it's just a starting point to be developed in the future.

As the above paragraph explains, even if, many researchers focused on the strategic management of networks, the stream still appears partially fragmented and lacks in a clear definition of the nature of the relationships among company, such as tangible and intangible exchanges; and how they are related to the value creation itself.

Some practitioners argue that the striving toward more complex, multi-level models of strategy, brings to a research for new inputs among the academic literature (Arthur & Borch, 1995). For this reason, it could be useful to further analyze how to generate value in a network following the theories of Business Model and Value Network.

Leverage the emerging Value Network theory and Business Model

Business Model

Many researchers strictly relate business models both to the concept of strategic network both to the concept of value creation. The linkages come directly with the analysis of the definitions itself:

- *“Business is fundamentally concerned with creating value and capturing returns from that value, and a model is simply a representation of reality. Combining these concepts we define a business model as a representation of a firm’s underlying core logic and strategic choices for creating and capturing value within a value network”* (Shafer, Smith, & Linder, 2005);
- *“It is the content, structure, and governance of activity systems designed so as to create value through the exploitation of business opportunities”* (Zott & Amit, 2010);
- *“It is the rationale of how an organization creates, delivers, and captures value”* (Osterwalder & Pigneur, 2010).

Moreover, both value creation and value capture occurs within a value network and the role a firm chooses to play within its network is an important element of its business model. In this view, business model, is conceptualized as a system of interdependent activities that are performed by the firm and its partners, with transaction mechanisms that links these activities (Haftor & Kurti, 2014).

The Digital and innovation markets diffusion bring practitioners to focus on the dynamic analysis of BM, because the adaptation of BM to new prospects of information value creation and capture is an imperative for organizations (Haftor & Kurti, 2014).

This brings to a further definition of Digital BM: *“elucidating how as organization is linked to external stakeholders and how it engages with them to create value for all exchange partners”*.

Many researchers tried to draw a framework for business models (Johnson et al., 2014; Morris, Schindehutte, & Allen, 2005) assessing specific levels of decision making to generate value among firms; but, when we talk about innovative entrepreneurial ecosystems, the Value creation and capture requires a new set of assumptions that makes it very distinct from tangible products (Haftor & Kurti, 2014).

This focus on “intangible assets” evaluation brings the research to the next step: the Value Network analysis.

Value Network

In order to properly analyze a network, many researchers, recently, studied the importance of intangibles exchanges between firms, as they constitute the 50/70% of the whole exchanges between firms nowadays (Wild, 2009).

However, to fully exploit the potential of this kind of approach, Verna Allee, the creator of Value Network theory, recommend an evolution of the traditional Business frameworks to an expanded view of potential value domains made of exchanges of “Knowledge” and “intangibles” other than normal goods (Allee, 2000b).

It is clear from the previous researches, that intangible exchanges are a crucial element of analysis, anyway, several articles struggles with the demonstration of the link between network and value creation.

In response of that a Value Network approach expanded dramatically in recent years.

The VN approach is based on the assumption that business organizations must be considered as “living system”, since they are complex and messy systems, and must be evaluated on the basis of relationships between them and “exchanges”, the molecular level of economic exchange (Allee, 2002, 2008).

Allee gives a new definition of intangibles strictly related with value creation; she affirms that other than considering intangibles as assets, they must be considered as negotiable

forms of value and deliverables, in a process of value conversion from non-financial to financial value (Allee, 2008).

The analysis proposed by Verna Allee group all the previous researches and proposes a more systemic way to analyze, evaluate and improve the performances of a network, based on four different phases: value mapping, exchange analysis, impact analysis and value creation analysis (Allee, 2000a, 2000b, 2002, 2008, 2009, 2011).

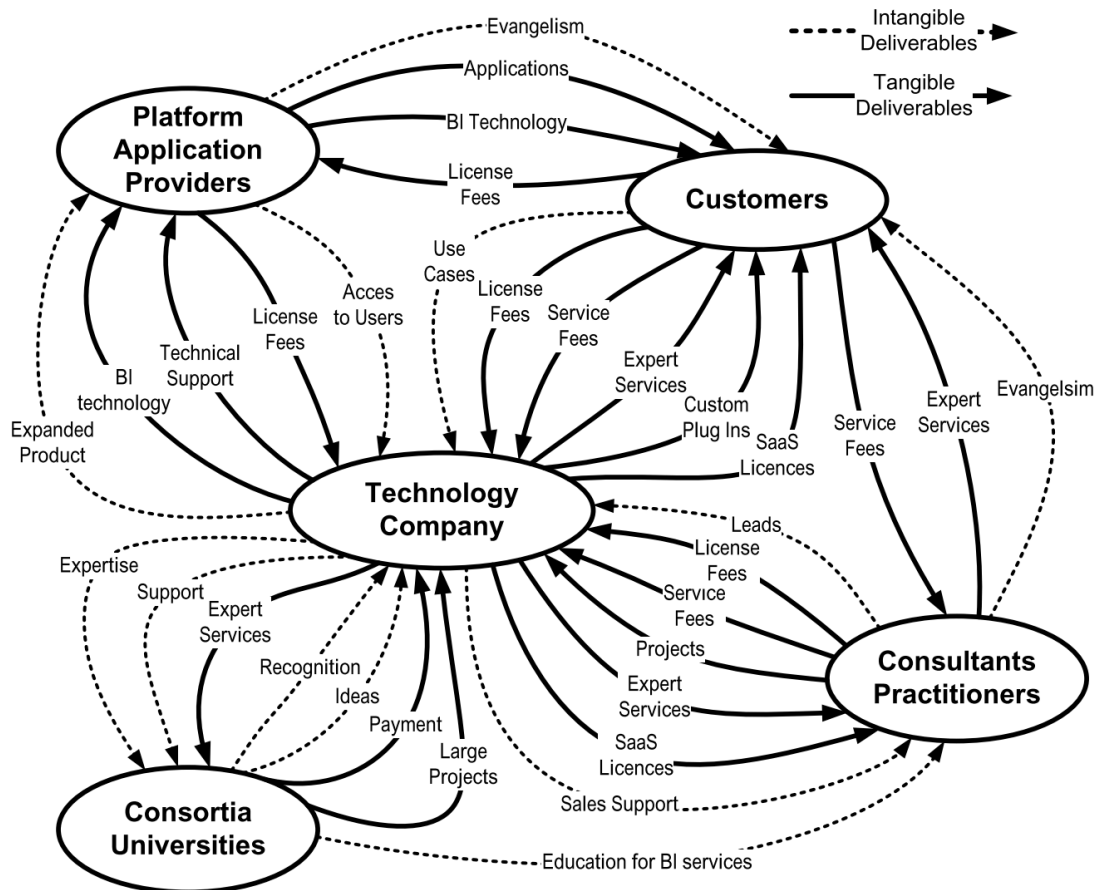


Fig.2: Example of Technology Company Value Network

Source: Allee, VNA and value conversion of tang. and intang. assets, 2008, Journal of Intellectual Capital

As a consequence, this thesis project aims at building a comprehensive framework for the complex Entrepreneurial network analysis, filling the two principal literature gaps:

1. Lack of a systematic focus on the strategic aspects of entrepreneurship networks;
2. Partial fragmentation of Strategic Network theory, that haven't fully implemented new innovative approaches such as Value Network and Business Model.

with the implementation of Strategic Network theory integrated by both Value Network and Business Model theories to support the Entrepreneurial network stream.

The most challenging purpose of this research is to apply all these theories to a subsystem that stands in the middle between the ample innovation system and the narrower intra-company system.

The output will be a comprehensible model able to give a clear picture of the Entrepreneurial network to academicians but, above all, to managers, practitioners and policy makers. The model will help them to better understand the role of each entity, what are the interactions among them, which kind of interaction is in place and, as a consequence, where to efficiently intervene to let the ecosystem grow and become self sustaining.

RESEARCH PROBLEMS

Nowadays, Entrepreneurial ecosystems, being extremely innovative and focused on digital markets, are becoming more and more complex, and highly dynamic systems. The high volume of studies, recently dedicated to the field, brings to different theories and interpretations of ecosystems but, generally, fails at giving specific indications on how to handle them and how to manage resource among them. The lack in management and strategic approach is, indeed, one of the main research problems that this academic research aims at study and solve.

Innovative networks are often evaluated using traditional frameworks, leading to huge underestimation of companies; there is an impellent need of new entrepreneurial management tools.

These 2.0 contexts must be considered as highly information/knowledge sharing systems and the evaluation of the so-called “intangibles” is, therefore, fundamental. Moreover, crucial for growing enterprises is the understanding of strategic dynamics of value generation and value conversion among the exchanges in the network. All these elements are embedded in a structural vision of Ecosystem that supports the strategic decisions of managers and entrepreneurs among an innovation driven network of resource sharing alliances.

The current literature lacks in the link between strategy and networks and the questions below summarize the research problems the study would approach:

1. Which are the key elements that lead the dynamic and complex context of Entrepreneurial Ecosystem?
 - a. Who are the key players of the system?
 - b. Which are the general behaviors of the system?
 - c. Which are the main variables of the value creation?
 - d. How can entrepreneurs capture the value generated in the system?
2. How is strategically structured an innovation driven network of alliances?
 - a. Which kinds of relationship are present in the network?
 - b. How the different relationships in an ecosystem affect the value output?
 - c. What are the strategic dynamics leading the network?
 - d. How can sharing resources and information lead to better performances for an enterprise?
3. Which are the main characteristics of a Value Network?
 - a. How important are “intangibles” in an innovative firm?
 - b. What are the main variables that compose the ecosystem in term of actors, context and exchanges?
 - c. How can “intangibles”, such as information and knowledge, be converted in order to provide better financial results for entrepreneurs?

RESEARCH OBJECTIVES AND EXPECTED IMPACT

The objective of this research is to analyze, evaluate and compare entrepreneurial ecosystem taking into consideration the whole system of exchanges and transactions among firms. In order to do that the research will attempt to combine two parallel streams such as the Strategic Network theory and the Value Network theory, analyzing their main differences and their main common points. The output of the analysis will be a qualitative model able to map the Ecosystem and to evaluate the value generated through it, giving a powerful tool for practitioners, managers and policy makers willing to manage an Entrepreneurial Ecosystem. This innovative and comprehensive analysis will fill the literature gaps of each stream bringing the two parallel theories together, mitigating their weaknesses and highlighting their qualities. While the Strategic network theory offers a solid and stable base of analysis, thanks to the numerous clues on the structure of the network and the positions held by the firms among it (network focal, structural equivalences, structural holes, network ties) and supported by several studies on firm alliances. The value network approach, leveraged with the theory on Business models, offers a more practical and schematic way to represent and finally evaluate Ecosystems.

Thanks to this approach, the model will bring, finally, to a clear representation that could be useful, in practice, for entrepreneurs' strategic business choices and for following studies on the subject.

To summarize the objectives are:

- Build an original qualitative model that relates the Strategic Network and Value Network theories and approaches to support the strategic assessment of an entrepreneurial ecosystem, in terms of:
 - Actor categories identification;
 - Analysis of the network position of the firms;
 - Network map;
 - Value creation and value capture assessment through the analysis of impacts of single entities;
- Apply the model to the San Francisco area entrepreneurial ecosystem.

RESEARCH METHODOLOGY

The empirical research will be held using the analysis of Case Studies, qualitative model of investigation particularly suitable for achieving the research objectives explained before, since that help understand holistically phenomena that do not separate easily from their contexts allowing the researcher to build new theories or, in this case, combine existing ones (Eisenhardt & Graebner, 2007; Halinen & Tornroos, 2005; Yin, 2003). The analysis approach adopted the combination of two different techniques: primary sources analysis and secondary sources analysis.

- *Primary sources analysis*: consisting in semi-structured interviews held to collect data starting from previously identified key issues and letting any innovative issue to emerge from the open discussion. In order to fully understand the dynamics of the analyzed field, two kinds of observation were adopted:
 - *Participant observation*: through the physical transfer to Stanford, living intensively involved with people in their cultural environment.
 - *Remote observation*: during the following 3 months, in order to keep a cognitive detachment from the object of study.
- *Secondary sources analysis*: monitoring the principal websites, reports, publications, blogs and social media on the analyzed field, in order to gather insights on the principal activities involving the network studied.

The ecosystem participants' categories are defined through the combination of primary and secondary sources analysis, starting from a list of principal entities previously analyzed:

- Startup
- Venture Capitals
- Business Angels
- Banks
- Venture Incubator
- Venture Accelerator
- Incubator
- Accelerator
- Co-working Spaces
- Universities
- Consulting Firm
- Governments
- Media

The case studies participant sample was chosen with the purpose of analyzing each participant group exhaustively; for that reason, two or three actors for each group will be interviewed, generally more than once.

The sources and research methods will be, thus: interviews (primary source of data), analysis of internal documents, study of secondary sources (research reports, websites, newsletters, databases, conference proceedings). This combination of sources allows the "triangulation of data", essential to ensure rigorous results in qualitative research (Bonoma, 1985).

CHAPTER 1 - INTRODUCTION

The importance of the role of Entrepreneurial Ecosystems in the economic market is a matter broadly grasped in academic literature and its importance increased during the outbreak of the recent financial crisis. The continuous search for a job growth and economic wellbeing highlights the benefits of Entrepreneurship. In fact, thanks to its fast-growing and rapid job creation nature, Entrepreneurship is one of the most important labor market strategy to solve the youth unemployment crisis (Vogel, 2013).

Moreover, being a lean and extremely flexible system it is highly recommended in a situation of vibrant and uncertain economy, compared to other solutions:

	Ecosystem types			
	Oligarchic	Big-Firm	State-Guided	Entrepreneurial
Characteristics	<i>Economic power concentrated in few individuals of families</i>	<i>Big firms guide and control the market</i>	<i>Government directs the economy and owns ecosystem factors</i>	<i>Small, nimble and innovative firms drive change and growth</i>
Advantages	<ul style="list-style-type: none"> • <i>Fast decisions</i> • <i>large resources</i> 	<ul style="list-style-type: none"> • <i>Large resources</i> • <i>Global scale Investment in R&D</i> 	<ul style="list-style-type: none"> • <i>Low labor cost</i> • <i>exports-led growth</i> • <i>focus on equality</i> 	<ul style="list-style-type: none"> • <i>Fast</i> • <i>Nimble</i> • <i>Innovative</i> • <i>resilient to downturns</i>
Pitfalls	<ul style="list-style-type: none"> • <i>Slow growth</i> • <i>social unrest</i> • <i>informality</i> • <i>corruption</i> 	<ul style="list-style-type: none"> • <i>Slow to introduce innovation</i> • <i>Rigid</i> • <i>high fixed costs and overhead</i> 	<ul style="list-style-type: none"> • <i>Dependence on exports</i> • <i>Commodities</i> • <i>Bureaucracy</i> • <i>ideological restrictions</i> 	<ul style="list-style-type: none"> • <i>Limited resources</i> • <i>Unstable</i> • <i>requires incubation</i>
Examples	India, Mexico, Brazil, Africa, Asia	US,EU,OECD	Venezuela, Cuba, China, France	US (Silicon Valley), China (SEZ), Argentina (Palermo), Israel, India (IIT)

Tab.1: Ecosystem Comparison

Source: Bernandez, The Power of Entrepreneurial Ecosystems: extracting booms from busts, 2009, PII Review

The actual worldwide economic situation makes Entrepreneurial Ecosystem an extremely up to date matter and drives the research with the purpose of creating sustainable ecosystem. Entrepreneurship environments are becoming an open issue since their ecosystem are growing and are becoming more and more complex during the time; the necessity of a strategic interpretation of the matter is increased by the gap among the different existing approaches for network assessment.

This academic research, thus, aims at giving a thorough view of the Entrepreneurial world and the dynamics present in its ecosystem, with a focus on Innovation and Digital Markets. The work is structured in two main sections: a critical literature review, relevant for the theoretical comprehension of the analyzed field, and an empirical study with the aim of giving a practical tool for entrepreneurs, to evaluate the Ecosystem performances and strategically act on its critical resources.

The literature review will follow a schematic approach based on a comprehensive evaluation of previous studies starting with an overview of the concept of Startup & Entrepreneurial ecosystem and ending with the detailed explanation of the dynamics of the Networks among firms, from a strategic standpoint.

Networks and ecosystem are often adopted alternately in literature, generating some misunderstandings (Peltoniemi & Vuori, 2004); in this research we embrace the perspective of Iansiti and Levien (Iansiti & Levien, 2004a), considering the term ecosystem as metaphor to understand business networks with the aim of giving powerful insights for studying strategy in that field.

The empirical analysis will, in turn, be divided in two segments:

- Development and description of an evaluation model, coming from the theoretical findings;
- Tests and adjustment of the model based on the case studies gathered on the San Francisco area.

During the empirical study the focus will be on the structure of the ecosystem highlighting the the positions held by each player among it and evaluating the the performances of the network, through tangible and intangible value creation. Fundamental, to handle confidently the argument, is a clear definition of Startup.

1.1 STARTUP DEFINITION

Many practitioners, during the last decades, tackled the concept of Entrepreneurship related to the concept of Innovation; in order to give an efficient explanation, we will limit our considerations summarizing below the principal findings related to the field:

Startup Definition		
Author	Definition	Year
Ries	<i>“A Startup is a human institution studied to offer a new product or service in extremely uncertain conditions”</i>	2011
Graham	<i>“Startups usually involve technology, so much so that the phrase high-tech startup is almost redundant. A Startup is a small company that takes on a hard technical problem”</i>	2011
Viswanath	<i>“A Startup is a 1-5 years old company that has a potential to grow up its enterprise value by 50x within the next 5 years and has a business that can scale up quite easily”</i>	2011
Blank	<i>“A Startup is a temporary organization built for researching a profitable, repeatable and scalable business model”</i>	2012
Cumming	<i>“A Startup is a small enterprise whose profits grow at least 30% annually, once it reaches its market”</i>	2012

Tab.1.1: Startup Definition
Source: Personal Elaboration

Each definition is focused on a different aspect related to a Startup.

Ries (Ries, 2011), in his definition, points out the innovative and uncertain environment in which entrepreneurs will work.

On the other hand, the academician Graham (Graham, 2011) gives a more specific explanation based on the concept of technology and on the need of new high-tech findings to solve business problems.

Viswanath (Tenner, 2011) links the concept of Startup with time and growth: he asserts that a firm must be established within 5 years and must grow by 50 times in the following 5 years in order to be considered a Startup; giving several clues on the scalability attitude of the market.

Steve Blank (S. Blank, 2012) bases his idea of Startup in strict correlation with profitability, highlighting its temporary nature, being only a part of the entire lifecycle of

an enterprise. In addition, the practitioner focuses on the behavior of a Startup business model that, in his opinion, must be repeatable and scalable to face the extremely flexible and uncertain market of Innovation.

Similarly, Cumming (Cumming & Knill, 2012) points out the profitability aspect focusing, instead, on a required growth as a fundament for a Startup consideration. In particular, he sets a threshold of 30% of annually growth ignoring many of the aspects that influence a business path.

This summary on previous definitions has the purpose to clarify and schematize the concept of Startup in its principal aspects and characteristics; introducing some of the topics that will be analyzed in following chapters.

CHAPTER 2 - METHODOLOGY

2.1 STATE OF THE ART

2.1.1 Objectives

The objective of the literature review is an accurate analysis of the principal research streams with the aim of highlighting the extant findings in the field and list eventual literature gaps, in which the review will focus, providing a set of possible theoretical solutions with the combination of different literature streams never related before. The systematic analysis of literature on research streams will act as a solid base for the development of an empirical evaluation model, tackled in the second phase of the academic work.

2.1.2 Techniques

The first step to analyze critically and exhaustively the principal research streams was to build a significant database of papers and articles published in leading academic and practitioner-oriented management journals during the last decades. Starting from an overview of the previous analysis on Entrepreneurial Ecosystem, the research focuses on the dynamics that build and sustain that complex environments with a special attention to a specific theoretical lens: Strategic Networks, supported by Value Network and Business Model theories. As a consequence, the keywords researched were:

- Entrepreneurial Ecosystems
- Entrepreneurship
- Entrepreneurial Networks
- Strategic Networks
- Value Networks
- Ecosystems
- Business Model

This approach brings to a basis of more than 200 articles that, after a further analysis, discarding the less innovative and the repetitive ones bring to a final pool of 84.

Research Stream	Incapsulated theme	References
Entrepreneurial Ecosystem	<i>Startup definition</i>	(S. G. Blank, 2007; S. Blank, 2012; Cumming & Knill, 2012; Graham, 2011; Ries, 2011; Tenner, 2011)
	<i>EE definition</i>	(Auerswald, 2014; Bell-Masterson & Dane, 2015; B. Cohen, 2006; Hielema, 2013; Isenberg, 2010, 2011; Mason & Brown, 2014; J. F. Moore, 1993; Neck et al., 2004; Pitelis, 2012; Rosted, 2012; Vogel, 2013)
Entrepreneurial Networks	<i>Definition & Characteristics</i>	(Aldrich & Zimmer, 1986; Amit & Zott, 2001; Bonner, et al., 2004; Borgatti & Halgin, 2011; Brockhaus, 1986; B. Cohen, 2006; Conway, 2001; Greve, 1994; Hoang & Antoncic, 2002; Holm et al., 1999; Johannisson, 1987; Minniti, 2004; Timmons, 1985; Ulhøi, 2004)
Strategic Networks	<i>Definition</i>	(Jarillo, 1988; Johanson & Mattsson, 1987; Khanna et al., 1998; Lorenzoni & Lipparini, 1999; Miles & Snow, 1984; Thorelli, 1986)
	<i>Alliance Networks</i>	(Ahuja, 2000; Baum et al., 2000; Gulati, 1995, 1998; Khanna et al., 1998; Mody, 1993; Quintana-García & Benavides-Velasco, 2003)
	<i>Social Capital</i>	(Bengtsson & Kock, 2000; Burt, 1992; Coleman, 1988; Jarillo, 1988; Khanna et al., 1998; J. L. Lin, 2004; Nahapiet & Ghoshal, 1998; Nalebuff & Brandenburger, 1996)
	<i>Trust</i>	(Antoldi et al., 2011; Boss, 1978; Burt, 1992; Coleman, 1988; Dirks & Ferrin, 2001; Driscoll, 1978; Gulati & Nohria, 2000; Gulati, 1995; Luo, 2002; Parkhe, 1998; Thorelli, 1986; Zaheer et al., 1998)
Strategic Network Structure	<i>Ties</i>	(Ahuja, 2000; Burt, 1992, 2002; Coleman, 1988; Gulati & Nohria, 2000; Walker et al., 1997)
	<i>Structural Holes</i>	(Burt, 1992, 2002; Friedkin, 1980; M. S. Granovetter, 1973, 1983;

		Gulati & Nohria, 2000; Walker et al., 1997)
	<i>Network dynamics</i>	(Baum et al., 2000; W. Cohen & Levinthal, 1990; Ghezzi et al., 2014; Gulati & Nohria, 2000; Khanna et al., 1998; Mody, 1993)
Business Model	<i>Definition</i>	(Bharadwaj et al., 2013; Haftor & Kurti, 2014; Morris et al., 2005; Osterwalder & Pigneur, 2010; Rai & Tang, 2013; Shafer et al., 2005; Sosna et al., 2010; Zott & Amit, 2010)
	<i>Strategy, Value & Framework</i>	(Chesbrough & Rosenbloom, 2002; Chesbrough, 2007, 2010; Haftor & Kurti, 2014; Johnson et al., 2014; Morris et al., 2005; Osterwalder, 2004; Shafer et al., 2005)
Value Networks	<i>Overview</i>	(Allee & Schwabe, 2009; Allee, 2000a, 2000b, 2002, 2008, 2010, 2011; Brooking, 1997; Chen et al., 2006; Edvinsson & Sullivan, 1996; Edvinsson, 1997; Gordon-Miller, 2004; Lev, 2001; Stewart, 2013; Wild, 2009)
	<i>Intangibles & Intellectual Capital</i>	(Allee, 2000a, 2000b, 2008; Bontis, 2001; Brooking, 1997; Edvinsson & Sullivan, 1996; Edvinsson, 1997, 2000; Etzkowitz, 2003; Green & Ryan, 2005; Harrison & Sullivan, 2000; Lev, 2001; Leydesdorff & Etzkowitz, 1998; C. Lin & Edvinsson, 2012; Lynn, 1998; Norton & Kaplan, 1996; Sullivan & Sullivan Jr, 2000; Sullivan, 2000; Sveiby & Risling, 1986; Sveiby, 1997; Wiig, 1997)
	<i>Value Network Theory: an innovative approach</i>	(Allee, 2000b, 2008, 2009, 2011; Peppard & Rylander, 2006)
Value Network Analysis	<i>VNA</i>	(Allee & Schwabe, 2009; Allee, 2002, 2008, 2011)

Tab.2.1: Research Streams & Incapsulated Themes table

Source: Personal Elaboration

The research focuses on the most proficient academic outlets such as: Academy of Management Review, Journal of Management, Management Science, Strategic Management Journal, Long Range Planning, Journal of Business Research and so on.

Combined with articles from the leading Practitioners Outlets like Harvard Business Review and MIT Sloan Management Review and other from Specialty Academic Outlets, Books and Official Conferences. In order to gather the articles, the research engines used were the well known: Google Scholar, Science Direct, Elsevier and Scopus with the addition of the Stanford University online article archive. This pool of articles was, then, gradually studied and classified following a common research framework based on:

- Title
- Author
- Journal
- Year
- Abstract
- Article Keywords: accurately created from scratch following the research proposal
- Literature Stream: based on the focus previously defined

This approach ensures a consistent database and a comprehensive classification with the aim of being the most accurate possible in the reconstruction and the critique of the past researches on the field.

2.2 EMPIRICAL ANALYSIS

The extensive literature analysis made focusing on the main streams of research, had the purpose of acting as a solid base for the consequent applicative work, strengthened by the empirical techniques applied.

2.2.1 Objectives

The objective of the empirical study is the development of a practical and innovative model able to give an illustration of an Entrepreneurial Ecosystem and a consequent strategic evaluation of the dynamics and value exchanges among it. Particular trait of the applicative model will be the focus on entrepreneurs' choices developing a proper tool to help them implementing strategies and taking strategic selections.

First, there will be an illustration of the model and its principal characteristics taken both from Strategic network theories, Value network theories and personal elaborations of them. Later, the model will be tested on the entrepreneurial ecosystem of San Francisco, vibrating environment considered by many experts the “best practice” of innovation and entrepreneurship but never analyzed under this specific and detailed Strategic and Value network lens. The ecosystem analysis objective will be the initial assessment of strategic groups participating in the network dynamics and a further evaluation of the structure and the value generated with the exchanges among them.

Therefore, the empirical research objectives will be the following:

- Analysis of the critical features of the two main literature streams;
- Identification of the most important characteristics of the two streams and implementation of a brand new model;
- Application of the model to the ecosystem of San Francisco:
 - Strategic groups assessment;
 - Evaluation of the dynamics and value generated of the network.

2.2.2 Case Study technique

With the aim of giving a detailed examination of the object of study, the research embedded the case study analysis technique. Case study facilitates holistic understanding of complex phenomena that do not separate easily from their contexts and allows the researcher to, thus, build new theory, or extend existing theories (Eisenhardt & Graebner, 2007; Halinen & Tornroos, 2005; Yin, 2003). Consistently with the research methodology employed, the participant sample was chosen with the purpose of analyzing in the most comprehensive way each of the critical groups belonging to the ecosystem; allowing the research to gather strategic information and generalize critical case to general field. Moreover, a multiple case study approach reinforced the generalization of results (McGrath, 1982; Meredith, 1998), and enabled a comparative analysis of findings, due to the possible presence of extreme cases, polar types, or niche situations within the theoretical sample. Still, the limited number of firms included in the sample allowed to conserve the positive properties of the single case study methodology, related to the provisioning of a throughout, extensive qualitative description and analysis of business

strategy under discontinuity with the needed depth and insight, difficult to replicate when considering a wider theoretical sample.

The case study approach adopted for the analysis combines two different empirical techniques listed below:

- Secondary Sources analysis
- Primary Sources analysis
 - Participant Observation
 - Remote Observation

This paragraph aims at explaining in detail each utilized approach.

Secondary sources analysis

The information collection starts with secondary sources and material gathered from local sources and associations such as Italia Startup. This approach gave us insights on how entrepreneurial ecosystems works and which are the main actors among it. Mainly, the analysis was focused on the monitoring of the most important media websites concerning the San Francisco Startup Ecosystem such as TechCrunch, HuffPo, VentureBeat and Reddit. Simultaneously, the research analyzed relevant reports and publications coming from well-known associations like Compass and CB Insights in order to fully understand the worldwide entrepreneurial ecosystem situation and the different roles among it. Later, we monitored the websites, the main social network pages, blogs and newsletters regarding the principal categories of the ecosystem such as Investors and Incubators as well as the principal Startup events, Pitch nights and Hackathons; gathering numerous insights on entrepreneurship and, especially, on the San Francisco bay environment.

In conclusion, the secondary sources analysis introduces the research to Entrepreneurship and, coupled with some of the primary sources collected, gives several clues on the assessment of the principal strategic categories of participants among the ecosystem.

The information gathered, thus, allow us to define the main institutional roles in an entrepreneurial ecosystem; below we illustrate them grouped in categories that we consider flexible and adaptable to any different ecosystem considered:

- *Startups*: any entrepreneurial venture registered as “startup” in the principal registries of the country;
- *Venture Capital Funds*: companies investing third-party capitals in early stages of startups (typically A series), in exchange of equity;

- *Business Angels*: companies investing their own capitals in seed phases of startups, in exchange of equity;
- *Banks*: any bank authorized by government, that works mainly with Startups or offer particular and favorable plans for them;
- *Incubators*: companies that helps and assist startup companies to develop, “incubating” them during their early stage, by providing services and training programs. Their programs last usually from 6 to 12 months;
- *Accelerators*: companies that helps and assist startup companies of each stage to develop, by providing services and training programs. Their programs last usually from 3 to 6 months and their intervention in companies is slightly less invasive than incubators’ one;
- *Venture Incubators*: Incubators with the peculiarity of making investments in companies for which they work for in exchange of equity;
- *Venture Accelerators*: Accelerators with the peculiarity of making investments in companies for which they work for in exchange of equity;
- *Co-Working spaces/Hacker spaces*: shared working environments oriented to young entrepreneurs, offering social gathering and, eventually, other small services and commodities;
- *Universities*: institutions of higher education and research that guarantee talents’ spinoffs;
- *Consulting Firms*: firms of attorneys, managers and tech experts providing professional advice purposely to entrepreneurs and startup companies;
- *Government*: the system by which the entrepreneurial environment is controlled. It groups the set of laws and administrative rules concerning entrepreneurial activities;
- *Media*: any well-known newspaper, magazine, website, newsletter and blog focused on startups and entrepreneurship.

Primary Sources analysis

Once briefly defined the subcategories of participant, and developed an underlying knowledge of the field; the research focus moves to the dynamics leading the network and the value exchanged among roles. In order to go deeper in the analysis, primary sources such as semi-structured phone calls and face-to-face interviews with principal actors and well-known experts of the San Francisco entrepreneurial ecosystem were utilized. The semi-structured nature of the interviews employed for data collection made it possible to start from some key issues identified through the literature, but also to let any innovative issue emerge from the open discussion (Yin, 2003). To ensure consistency and comparability among different interviews, the main questions in the research protocol were common for all interviewees, but there were separate questions customized on the specific roles of the respondent, and follow-up questions on the emergent issues.

In order to fully understand the dynamics of the network really useful resulted the utilization of Participant Observation technique, coupled with the remote observation adopted later:

- *Participant Observation*: it is a data collection method typically used for qualitative research; its aim is to gain a close and intimate familiarity with a determined group of individuals and their activities through an intensive involvement with people in their cultural environment. The application of that technique was possible thanks to the experience at Stanford University during the summer session from May to August 2015. Stanford is considered by many experts the heart of the vibrant San Francisco bay area called “Silicon Valley”; countless entrepreneurial events are held weekly and the most outstanding talents hang around the university every day. Thank to this, the researcher experienced daily most of the activities that lead the field studied in this research work, accelerating the learning process.

In particular, the researcher participated to the following events / panels / meetings / programs:

- Silicon Valley Innovation Academy program (SVIA) (June-July 2015)
- Mentorship Panel (July 29, 2015):
 - Dara Treseder, FileMaker Inc.
 - Adrian Mulling, Co-Founder at Deedings
 - Jared Nielsen, Google project mgmt.
 - Marie-Claire Gorham, Content manager at App Factory
 - Drew Gorham, App Factory CEO
- VC panel (July 20, 2015):
 - Chris Cowart, Montage Venture
 - Tammy Camp, 500 Startups
 - William Treseder, BMNT partners
- Design Thinking panel (July 9, 2015):
 - Madhav Thattai, GSB
 - Jojo Roy, Sequence
 - Caroline Flagiello, IDEO
 - Grace Hwang, IDEO
- Stanford Sharks event:
 - Steve Blank, Lecturer & writer
 - Jackie Space, BMNT partners principal
 - Andrea Barrica, 500 startups

- *Remote Observation*: it is an observational technique that does not include the overlapping roles of researcher and active member of the studied group. This helps to keep a cognitive detachment from the object of study, preserving the idea of "objectivity" that, according to experts' theories, is the most significant weakness of the qualitative approach. During this period, spent in my home country, I analyzed the gathered data developing the empirical model in the most objective way, far from the environment analyzed.

The principal objective of interviews was to trace the flow of value exchanged and clarify the position of each group of participants among the network. Interviewing directly people inside the ecosystem is the most accurate way to depict the structure of the network and brings crucial insights to the research work. As the validity and reliability of case studies rest heavily on the correctness of the information provided by the interviewees and can be assured by using multiple sources (Yin, 2003), several secondary sources of evidences were employed to supplement the interview data.

The two interview techniques utilized were:

1. Phone/Skype calls: during the entire period of research from May to November 2015 (7 months);
2. Direct Interviews: during the permanence in the USA from May to August 2015 (3 months).

The principal interviewed actors are summarized below:

Company name	Participant group	Referent Name	Referent Role	Interviews #
App Factory	Startups	<i>Drew Gorham</i>	CEO & Co-Founder	2
Luxe Valet	Startups	<i>Stephen Rocco Rodi</i>	Director of Communications	1
Hummer Winblad Venture Partner	Venture Capital Funds	<i>Ann Winblad</i>	Founding partner	2
Alsop Louie Partners	Venture Capital Funds	<i>Ernestine Fu</i>	Venture Partner	2
Sequoia Capital	Venture Capital Funds	<i>Stephanie Zhan</i>	Investment Analyst	2
Band of Angels	Business Angels	<i>Ian Sobieski</i>	Managing Director	1
		<i>Larry Kelly</i>	Chair of Energy/Innovation	2
Silicon Valley Bank	Banks	<i>Lilly Huang</i>	Managing Director	3
Alchemist Accelerator	Incubators/ Accelerators	<i>Danielle D'Agostaro</i>	Partner & COO	2
Matter.	Incubators/ Accelerators	<i>Lara Ortiz-Louis</i>	Program Coordinator	1
500 Startups	Venture Incubators/ Accelerators	<i>Bedy Yang</i>	Managing Partner	2
Plug & Play	Venture Incubators/ Accelerators	<i>Alireza Masrou</i>	Managing Partner	2
		<i>Jupe Tan</i>	Venture Partner	1
Startup Castle	Co-Working spaces	<i>Katerine Fritsch</i>	Co-Founder	2
Rocket Space	Co-Working spaces	<i>Sophie Bousset</i>	Associate	2
Stanford University	Universities	<i>Tom Kosnik</i>	Lecturer, co-academic director	3
Stanford University	Universities	<i>Burke Robinson</i>	Lecturer & CEO of Burke Robinson LLC	3
Bend Law Group	Consulting Firms	<i>Alex King</i>	Small Businesses Attorney	3
				36

Tab.2.2: Interviews Table
Source: Personal Elaboration

The interviews lasted 43 minutes on average and the responses from interviewees were first recorded and transcribed and, then, a within-case data analysis was carried out, in order to generate the necessary insights on the issues under scrutiny. Informant were re-contacted later, after a first exchanges map development, by phone in order to gather evaluations on impacts on performances and value added costs through a Likert Scale. Lastly, the case descriptions and results were reviewed and confirmed by the interviewees, to mend any error or bias and ultimately ensure the correctness of interpretations.

The scheme of analysis used in the process of interviewing critical actors is, basically, divided in three sectors, and it is illustrated below:

1) For each ecosystem's player specific key figures have been gathered:

- Startup
 - Revenues
 - # of FTM (full time equivalent)
 - Fund raised
- Venture Capital
 - # of startup in portfolio
 - Sector Specialization/Startup Target
 - Average Investment
 - Average equity (%) owned of startups in Portfolio
- Business Angel
 - # of Startup in portfolio
 - Sector Specialization/Startup Target
 - Background
 - Average Investment
 - Average equity (%) owned of startups in Portfolio
- Venture Incubator & Venture Accelerator
 - # of startup in portfolio
 - Sector Specialization/Startup Target
 - Average Investment
 - initial endowment
 - Average equity (%) owned of startups in Portfolio
- Incubator/Accelerator
 - # of Startup incubated/supported
 - Revenues
 - # of FTM (full time equivalent)
 - Sector Specialization/Startup Target

- Co-working Spaces/Hacker spaces
 - # of Startup hosted
 - Revenues
 - # of FTM (full time equivalent)
 - Sector Specialization/Startup Target
 - Universities, Business School, Technical School
 - # of training course for new entrepreneurs
 - Consulting Firm
 - # of startup supported
 - Kind of consultancy (legal vs business vs technical)
 - Work for equity (yes vs no)
- 2) Structure of the Ecosystem as a Value Strategic Network:
- Network Focal
 - Structural Equivalences
 - Structural Holes
 - Lock-in and Lock-out effect
- 3) Positioning in the ecosystem as a Value Strategic Network:
- Activities performed within the Network
 - Value/Benefits perceived by being part of the network
 - Other network participants tied to the company
 - Direct/Indirect Tie
 - Tangible/Intangible

For each detected exchange among firms, an evaluation of the impacts on the company performances and of the cost of each value added to the ecosystem was asked, using a 5-point Likert Scale approach:

1 = Very Low 2 = Low 3 = Medium 4 = High 5 = Very High

Likert Scale is a unidimensional scaling method in that concepts are usually easier to understand when expressed in a single dimension (Tastle & Wierman, 2007); used as common rating format for surveys and qualitative assessment in general. The Likert scale is based on a 5-points scale made to reduce possible biases deriving from the qualitative nature of the questions. Subsequently, grading each alternative from 1 to 5 and combining the results it will be possible to illustrate the flow of value passing through each actor. In case of multiple answers on a single exchange, the research model will compute a weighted average pondered on Consensus. Consensus is a value between 0 and 1 representing an adjustment necessary to combine with parametric instruments different qualitative opinions gathered, for example, with a Likert scale. A close equivalent to consensus might be “the collective opinion of a group”, in fact, it allows to give as a result a value representing the majority of the opinions, generating a consensus among them (Ghezzi et al., 2015; Tastle & Wierman, 2007). The formula necessary for the calculation of the consensus value comes from academicians Tastle & Wierman (Tastle & Wierman, 2007) and it is illustrated below:

$$Consensus = 1 + \sum_{i=1}^n p_i * \log_2 \left(1 - \frac{|X_i - \mu_x|}{d_x} \right)$$

p_i = probability of outcome X_i

μ_x = mean of X

d_x = $X_{max} - X_{min}$

The model specific calculations are illustrated in the appendix 7.1.

CHAPTER 3 - LITERATURE STATE OF THE ART

This chapter is dedicated to an exhaustive and critical literature review of the principal issues tackled during the research.

The research theoretical framework is based on the literature on Entrepreneurship Networks, Strategic Networks, Value Networks and Business Model.

	Entrepreneurial Network	Strategic Network	Value Network	Business Model
<i>Research Objectives</i>	<i>Representation of the ecosystem grouping Entrepreneurship and its related business network, and analysis of its main principles and characteristics</i>	<i>Systematic analysis of the strategic aspects related to entrepreneurship, such as strategic positioning and social behaviors of the actors</i>	<i>Focus on value generated by entrepreneurship networks, with particular attention on the nature of their exchanges</i>	<i>Analysis of the meaning and the structure of a Business Model, in order to organize all the processes that bring a firm to strategically generate value among its Network</i>
<i>Literature Gaps</i>	<i>The wide literature on the field does not concentrate, systematically, on the relevant strategic aspects related to entrepreneurs choices and behaviors</i>	<i>Academic literature on Strategic Networks proves to be partially fragmented, without clearly define the link between strategic choices and value generation</i>	<i>Value Network literature does not clearly define how to deal with ecosystems strategically, lacking in a focus on system positioning behaviors.</i>	<i>Business Model theories result generally confused and chaotic, due to the number of different interpretation of the subject; this bring literature to lack in a clear path</i>

Tab.3.1: Literature Streams: Objectives & Gaps

Source: Personal Elaboration

Table 3 summarizes the contributions of this study to each of the research streams, as well as the literature shortcomings that will be addressed.

3.1 ENTREPRENEURIAL NETWORK: AN ECOSYSTEM PERSPECTIVE

As economic activity is mutating from stand-alone to interconnected economic actors generating a network economy as it is today; many academicians focused their researches on Entrepreneurship and its related business network, highlighting the relationships established among them with an ecosystem approach (Anggraeni et al., 2007a).

However, the majority of them uses, interchangeably, the terms ecosystem and network giving different interpretations of them and generating confusion in the lector. For that reason, the research work dedicates this initial part to the clarification of the concept.

3.1.1 The concepts of Ecosystem and Network

The evolution of economic markets, embedded in networks of social, professional and exchange relationships among them actors, brings the research to tackle the concept of ecosystem as a metaphor for understanding business networks. Mainly, the definitions of ecosystems highlight the fact that interconnected economic agents depend on each other for their success and survival, stressing the importance of collective health of the system (Anggraeni et al., 2007b). Among the different interpretations of the matter, the research work illustrates the most proficient two descriptions of business ecosystem:

1. Moore (J. F. Moore, 1993): *“The term ecosystem circumscribes the microeconomics of intense co-evolution coalescing around innovative ideas. Business ecosystems span a variety of industries. The companies within them co-evolve capabilities around the innovation and cooperatively and competitively support new products, satisfy customer needs, and incorporate the next round of innovation”*.
2. Iansiti and Levien (Iansiti & Levien, 2004b): *“Basically, a business ecosystem is a business network. Business ecosystems are formed by large, loosely connected networks of entities, that interact with each other in complex ways, and the health and performance of a firm is dependent on the health and performances of the whole”*.

They, both, claim that a new concept is needed to shape strategy in interconnected business through the adoption of a metaphor from biological ecosystem in order to communicate the

insights on the working of business ecosystem and create strategy out of it (Anggraeni et al., 2007a).

Moore interprets business ecosystem as a perspective to understand how an economic community works, illustrating the concept of ecosystem framework as an extension of the once of network, that opens to a new way of looking at the structure, interaction and exchanges among organizations (James F Moore, 2006). On the other hand, Iansiti and Levien focus on the metaphor of biological ecosystems considering it a powerful way to conceptualize networks through the utilization of their specific features such as the structure, the relationships among members, the kinds of connection among them, and the different roles played by the participant actors(Iansiti & Levien, 2004a, 2004b).

Basically, Iansiti and Levien use the business ecosystem as metaphor for business networks while Moore defines a business ecosystem as more than just business network.

Hereby, the present research work will embrace Iansiti and Levien theory utilizing, from now on, the term ecosystem as a perspective providing powerful insights out of the strategic studies on entrepreneurial network this academic essay is going to present.

3.1.2 Entrepreneurial Network

Many researchers tackled the Entrepreneurial Network topic, giving insights on which benefits come from it. The common approach of this stream tend to be more sociological and psychological, focusing on behaviors of entrepreneurs and on “why” they act among the network. The main contribute, coming from scholars that focused them attention on Entrepreneurial networks, has been to recognize the importance of the environment and its relative context variables, without considering in detail the individual characteristics of entrepreneurs. Given the extant number of academic researches, the analysis approach will be limited to an illustration of the most cited theories and principal contents.

The initial part of the paragraph is dedicated to the few notable attempts to give an ecosystem perspective to Entrepreneurial Network, illustrating their principal features and their systemic lacks, that the research work aims to fill; while the following part focuses on the concept of Network, illustrating the extant academic materials present.

The analysis of entrepreneurial ecosystems begins with one of the most proficient academicians in the field, Daniel Isenberg. Mainly, he adopts an holistic approach to describe Entrepreneurial basic features (Isenberg, 2010), describing an Entrepreneurial

Ecosystem as “a set of individual elements, such as leadership, culture, capital markets, and open-minded customers, that combine in complex ways”. In isolation, each of these elements is insufficient to sustain the ecosystem, the holistic system is viewed as a turbocharge venture creation and growth (Isenberg, 2010).

The comprehensive ecosystem perspective introduced by Isenberg is summarized in six domains, giving a static vision of the network (Isenberg, 2011):

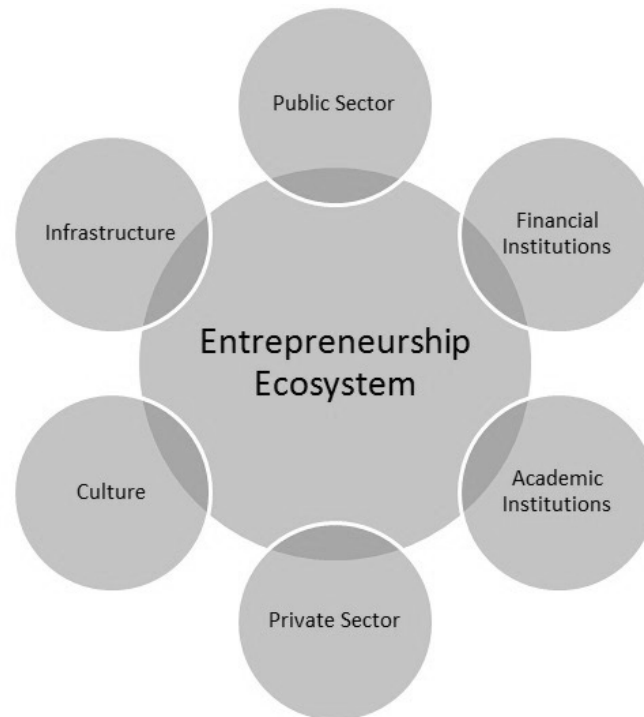


Fig.3.1: Entrepreneurship Ecosystem 6 domains

Source: Daniel Isenberg – The Entrepreneur Ecosystem Strategy as a new paradigm for economic policy

In addition, Isenberg focuses especially on the policy aspect, defining some common principles useful for any governmental effort. In fact, he considers Entrepreneurship completely different from SME and, consequently, proposes different policies and environments based on an holistic approach (Isenberg, 2011).

However, his vision, even if useful under a static perspective of the ecosystem and for countless insights it gives to policy makers, results in a general lack in practical implementations on network dynamics and on strategic positioning among it.

In addition, Auerswald sees Entrepreneurial ecosystems as a highly context-dependent activities; and introduces, taking inspiration from evolutionary biologists, the metaphor of the “recipe” as the algorithm employed to transform inputs into outputs (Auerswald, 2014).

He makes the example of the culinary instance to explain that knowing how to build an ecosystem is not the same thing as knowing how to bring together all the actors; on contrary, it is knowing how to execute the sequence of operations that are specified, more or less closely, in a “recipe”.

Many others attempted to give a definition of Entrepreneurial Ecosystem (Hielema, 2013; Mason & Brown, 2014; J. F. Moore, 1993; Neck et al., 2004; Rosted, 2012); among them, Mason gives a comprehensive explanation individuating 4 different categories that must be interconnected in order to generate sustainable systems (Mason & Brown, 2014):

1. *Entrepreneurial actors*: both potential and existing
2. *Entrepreneurial organizations*: firms, venture capitalists, business angels
3. *Institution*: universities, public sector, financial bodies
4. *Entrepreneurial processes*: business birth rate, # of high growth firms.

Moreover, he defines a set of characteristics and features that an environment must follow in an attempt to generate an outline for the ecosystem profitability (Mason & Brown, 2014). Unfortunately, he never went through the links among categories in a detailed way. Peter Vogel, in his research on “*Building Entrepreneurial Ecosystems as a way forward*” (Vogel, 2013), puts strong emphasis on the relation between Entrepreneurial ecosystem and the economic benefits coming from that, such as well being, jobs creation and economic prosperity and proposes a model of Ecosystem centered on three overarching categories subdivided in sub-components, similar to his predecessors.

Notable, is the attempt made by Cohen and Neck (B. Cohen, 2015; Neck et al., 2004) to model the critical supports needed for enhancing new venture creation. They believe in two different kind of network: the first one made of informal relations and the second one of actors in the economic community.

On these different networks they develop the Entrepreneurial system summarized below:

System Component	Definition
<i>Informal Network</i>	Entrepreneur's friends, families, colleagues or informal relations with similar companies.
<i>Formal Network</i>	Research university, government, capital services and talent pool
<i>University</i>	They have significant impact on the evolution of an ecosystem, thanks to primary research and education.
<i>Government</i>	They foster the development of entrepreneurial ecosystems through tax rates and incentives.
<i>Professional and support services</i>	Tax and legal support, consultants, and firms in the supply chain
<i>Capital Services</i>	Venture Capitalists or business angels have a critical role in the development of an ecosystem
<i>Talent Pool</i>	Qualified employees are critical for the success of an Entrepreneurial ecosystem

Tab.3.2: Cohen & Neck Entrepreneurial model

Source: Neck & Cohen, An entrepreneurial system view of new venture creation, 2004, Journal of Small Bus. Mgmt

The detailed subdivision of networks gives numerous clues for future considerations on the relationships and strategic linkages among them, concept Cohen & Neck didn't exploit during their analysis.

The few attempts to model an Entrepreneurial ecosystem, consider it holistically and manage each of its components as a "recipe", give several insights on the vision previous academicians have about Entrepreneurship and how to build it.

However, to evaluate the performances of the ecosystem and its participants, and to give a strategic definition of its structure is crucial to understand the dynamics present and to coordinate the ecosystem resources flow. For that reasons is highly recommended to focus the research on a further analysis of the Networks on which the system relies.

The interest in Networks spans all the social sciences, rising even faster in physics, epidemiology and biology (Borgatti & Halgin, 2011). Approximately 15 years ago, research on networks emerged as a new critical area of inquiry within the field of

entrepreneurship. Despite its increasing popularity, there still exists considerable confusion about Network theorizing (Borgatti & Halgin, 2011).

It is stated among literature that an entrepreneurial activity cannot be considered alone but must be integrated into a broader Network consideration (Debresson, 1999). Focusing on Networks, the research will show how an enterprise performance is affected and how the surrounding environment enhances, or jeopardizes, a business development.

Many researchers tackled the field of Entrepreneurial network (Aldrich & Zimmer, 1986; Antoldi et al., 2011; Bonner et al., 2004; Borgatti & Halgin, 2011; B. Cohen, 2015; Greve, 1994; Hoang & Antoncic, 2003; Holm et al., 1999; Minniti, 2004) and the most valuable definitions on the topic are the following:

Author	Definition	Year
Greve	<i>“Social processes influencing founding rates and social structures facilitating entrepreneurship through mobilization of complementary assets”</i>	1994
Hoang	<i>“Content of Network relationships, governance, and structure”</i>	2002
Ulhoi	<i>“Social interactions and mechanisms”</i>	2004
Antoldi	<i>“A social structure that includes a set of relationships between a group of individuals”</i>	2011
Borgatti	<i>“A set of actors or nodes along with a set of ties of a specified type that link them”</i>	2011

*Tab.3.3: Entrepreneurial Network Definition
Source: Personal Elaboration*

Recent studies tried to explain business foundings through a network perspective (Aldrich & Zimmer, 1986). The academician Greve (Greve, 1994) further explains this concept, embedding it in his definition of Network; starting from the studies on business foundings and failures rates, he studied entrepreneurship using a network perspective. He asserts that networks show the macro conditions that are a result of individual actions in a social context. Moreover, through a network analysis there is the possibility to show how this social structure and actions influence business foundings. Greve, in fact, strictly links

entrepreneurial networks with social relations, being the vehicle for resources that are necessary to establish firms (Greve, 1994).

Hoang and Antoncic, in their research on Network-based entrepreneurship (Hoang & Antoncic, 2003), analyze the concept of network illustrating its three essential components: the content, the governance and the structure of the relationships among firms.

1. *Network content*: it is the key benefit coming from a relationship; networks provide the access to information and advice, and entrepreneurs rely on them for business information and problem solving. In the uncertain and dynamic conditions under which entrepreneurial activity occurs, resource holders such as potential investors or employees, are likely to seek information that help them to gauge the underlying potential of a venture (Amit & Zott, 2001).
2. *Network governance*: it consists in the mechanisms that undergird and coordinate network exchanges. Relying on “implicit and open-ended contracts”, supported by social mechanisms rather than legal enforcement, usually create cost advantages compared to expensive bureaucratic mechanisms (Jarillo, 1988; Thorelli, 1986).
3. *Network structure*: it is defined as the pattern of relationships generated by ties between actors; differential positioning directly impacts on entrepreneurial performances (Baum et al., 2000; M. S. Granovetter, 1973; Gulati & Nohria, 2000).

We will further focus on the structure of a network later in the analysis.

While the first two components give several clues on why it is advantageous to generate a Network and how it must be managed; the third one introduces a structural concept of network that will be tackled in a more detailed way in the next chapter.

Similarly to Greve, academician Ulhøi (Ulhøi, 2004) focuses on the social dimension of Networks. Asserting that entrepreneurship cannot merely be understood in terms of “personality characteristics” or in sterile economic terms, he directly links the concept of Entrepreneurship with social networks. Previous researches were concentrated on personal characteristics of entrepreneurs (Brockhaus, 1986), trying to identify and characterize personal attributes related to successful entrepreneurs (Timmons, 1985) diverting substantially the attention from the importance of the environment and the position characteristics of the entrepreneur itself. Others consider it as a purely economic-driven contractual relationship, without considering any socially driven dimension. Ulhøi strongly criticizes these assertions, supporting a network-based view of Entrepreneurship based on

social relationships and interactions considering both personal and business networks as well as institutional and social environment (Ulhøi, 2004).

On contrary, the academicians Antoldi and Borgatti, in their definitions, give a more operational and structural approach to networks.

Antoldi (Antoldi et al., 2011) emphasizes the importance of networks to small firms, focusing on entrepreneurship as a collective, rather than an individualistic phenomenon (Johannisson, 1987). His concept of network is based on the studies made by the scientist Conway (Conway, 2001) includes four key components:

1. *Actors*: companies that make up the network (nodes of the web);
2. *Links*: the links are the arches that connect nodes, representing the relationship between the actors;
3. *Flows*: exchanges that occur between actor within the network, they may have different natures and contents;
4. *Mechanisms*: modes and rules of interaction employed by the actors depending on the different aims of the network.

Borgatti (Borgatti & Halgin, 2011) divides the concept of network in two different domains:

1. *Network theory*: it refers to the processes that interact with network structures to yield certain outputs for companies;
2. *Theory of networks*: it refers to the mechanisms that determine why networks are structured in the determined way.

Considering one theory without treating simultaneously the other one harms the understanding of the network dynamics. Moreover, he clarifies the difference between groups and networks, highlighting that networks do not have “natural” boundaries and may not be connected, conversely from groups (Borgatti & Halgin, 2011).

This dissertation on the concept of Network, from the definition to its most valuable characteristics and benefits helps us to better understand the main ideas of the academic literature concerning the topic. However, the extant researches on the field aren't concentrated on the relevant strategic aspects coming from the idea of Network, and only few pioneers begin to consider Strategy as part of Entrepreneurial Network with a systematic approach (Alvarez et al., 2006).

Given that, a strategic interpretation of networks would be highly beneficial to the field.

3.2 STRATEGIC NETWORKS

The growing importance of the Entrepreneurial stream brings practitioners to study the dynamics of the Network and the entrepreneurs' behaviors among it, converting it in a "strategic matter" (Jarillo, 1988). Once introduced the concept of Entrepreneurship, highlighting the literature contents on entrepreneurial ecosystem and network, and clarifying the link among it; the aim of this chapter is to give a strategic interpretation of the concepts, showing how a structured strategic network will bring entrepreneurs to higher long-term performances and better results.

3.2.1 The prelude of Strategic Networks: Strategic Alliances

The first studies introducing the dynamics by which such Strategic systems are formed, considered the predecessors of the broader stream concerning Strategic Networks, focuses on strategic "Alliances"; the characteristic of the early researches is that they do not look at the whole ecosystem but only at the relationships among few firms in detail, focusing the analysis on a restricted number of relationships.

According to academicians Nohria and Garcia-Pont, networks arise as the aggregate result of a series of independent choices by firms in an industry to form Alliances (Garcia-Pont & Nohria, 2002).

Many researchers, then, focus their studies on Strategic Alliances, that are considered a first step toward the broader concept of Network, as they are seen as its atomistic level. Among different definitions two are the clearest and most explicative. Mody defines Alliance as "a flexible organizational mode that allows firms to bring complementary strengths together in order to experiment with new technological and organizational ideas" pointing out the flexible nature of the agreement that doesn't require market transaction and doesn't represent "planned coordination" within an integrated firm (Mody, 1993). Similarly, Gulati, in his early studies, defines Strategic Alliances as "voluntary arrangements between firms involving exchange, sharing, or co-development of products, technologies, or services", focusing on the behavior that drives a company to ally with others (Gulati, 1998). The central research questions in this context are then: why firms engage in alliances, and with whom they specifically orient their behavior towards. Many researchers focuses on Learning Alliances, as enabling firms to gain access to partner

technological and knowledge resources, this is than advantageous type of cooperation (Baum et al., 2000; Khanna et al., 1998; Mody, 1993). It is particularly beneficial for small firms when time is of the essence and easy access to resources directly influences their performances (Baum et al., 2000).

Gulati argues that there are two other types of alliance driven respectively by strategic behavior that leads firms to try to enhance their competitive positioning or market power and transaction costs resulting from small numbers bargaining (Gulati, 1998). Moreover, he adds to the research stream a set of hypothesis that drives firms to orient their Alliance behaviors, based on Social context [Fig.4].

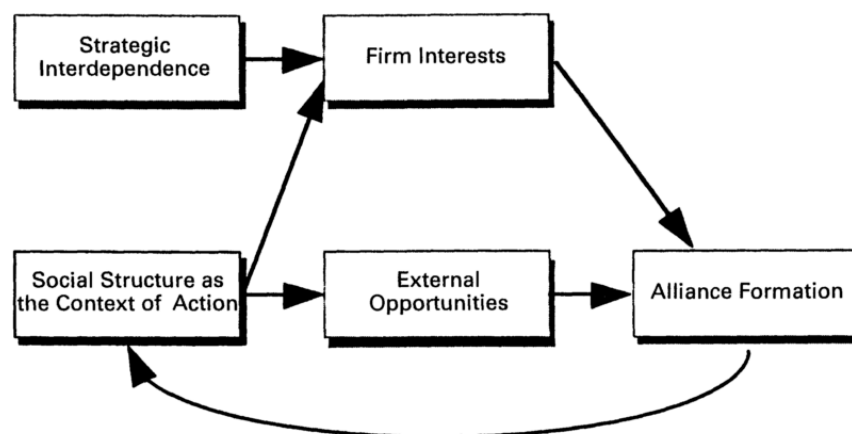


Fig.3.2: Social Structural Theory of Alliance formation

Source: Gulati, *Social Structure and Alliance Formation Patterns*, 1995, *Administrative Science Quarterly*

The academician Gulati asserts, in fact, that social networks of prior alliances plays an important role in shaping future alliance formation, thanks to the source of information it gives about the reliability and capabilities of their current and potential partners (Gulati, 1995).

Baum, in his comprehensive analysis, gives a structure to Alliance networks using an empirical study on biotechnology firms. The result is the consideration of “horizontal” alliances with other biotechnology firms; and “vertical” downstream and upstream alliances with the other members of the Ecosystem such as government labs, universities, marketing firms and research institutes (Baum et al., 2000).

More than an academician, strictly links Alliance networks with Startups considering them the most benefited from the resource sharing and access that, otherwise, normally requires years of operating experience to acquire (Ahuja, 2000; Garcia-Pont & Nohria, 2002).

These alliances/relationships between firms, generate a set of resources jointly owned by the partners called “Social capital” (Antoldi et al., 2011; Burt, 1992; Walker et al., 1997).

3.2.2 Social Capital

With the aim of giving insights on the strategic dynamics leading a network, in this paragraph, the research analyzes in detail the concept of Social Capital as a value added coming from the establishment of a business relationship.

Many practitioners struggle at giving a definition of Social Capital since it is a jointly owned resource belonging to a Network of organizations, without clear boundaries and without written contracts specifying it. The most comprehensive definition is given by Nahapiet & Ghoshal, which assert that Social Capital in business environments is defined as “*the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit*” (Nahapiet & Ghoshal, 1998). The scholars Nahapiet & Ghoshal (Nahapiet & Ghoshal, 1998), furthermore, define the nature of this resource in a comprehensive model, showing three inter-related dimensions of Social Capital:

- *Structural dimension*: focuses on the pattern of connections (# and kind of actors involved);
- *Relational dimension*: refers to the behavioral assets of the network (trust, norms, sanctions);
- *Cognitive dimension*: relates to the common system of meanings among partners (interpretation, language and codes).

Through these aspects Social Capital can be created allowing communication and exchange of knowledge among firms.

Burt (Burt, 2002) add to the definition of Social Capital the consequence of future behaviors asserting that, once one of the two parties jointly owning the resource withdraws, the connection dissolves with whatever social capital it contained.

He also gives critical importance to this Capital, among his dissertation on imperfect competition, affirming that it is the “final arbiter of competitive advantage” (Burt, 2002).

Coleman, instead, gives a slightly different inclination to the concept, linking it to the stability of the relationship. He considers Social Capital a constraint, as well as a resource,

that allows firms to risk greater investment in the cooperative intercourse diminishing the threat of opportunistic behaviors (Coleman, 1988).

Several academicians have discussed on opportunism among relationships (Bengtsson & Kock, 2000; Jarillo, 1988; Khanna et al., 1998; J. L. Lin, 2004; Nalebuff & Brandenburger, 1996); these can be generated by some interests, access to critical information and many other crucial shared relations.

Khanna (Khanna et al., 1998), while talking about learning alliances, asserts that a firm's behavior is conditioned by the portfolio of markets in which is present, and to He distinguishes between two different kinds of benefits coming from relationships:

- *Private benefits (competitive behaviors)*: those benefits that a firm earns unilaterally from partners' skills and that it uses personally for gaining competitive advantage in other areas;
- *Common benefits (cooperative behaviors)*: those benefits that accrue to each partner from the collective application of the learning coming from the alliance.

The ratio of private to common benefits will be higher if there are more opportunities to have opportunistic behavior among the relationship. The greater the overlap between alliance scope and firm scope, the lower the threat of opportunism (Khanna et al., 1998). The academician calls the ratio "*relative scope*".

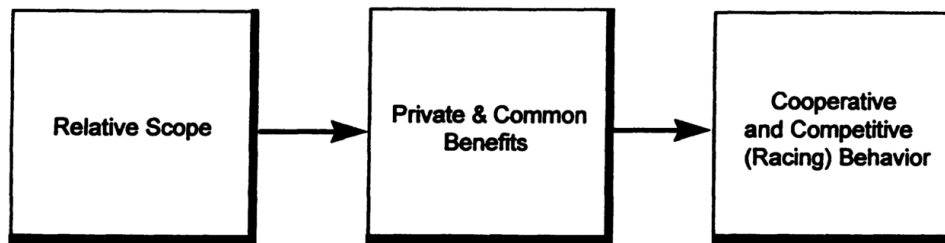


Fig.3.3: Schematic representation of relative scope.

Source: Khanna et al., The Dynamics of Learning Alliances, 1998, Strategic Management Journal

A further contribution is given by Jarillo in his paper On Strategic Networks (Jarillo, 1988). He considers the threat of opportunistic behavior, among with early-mover advantages and other strategic considerations, part of the transaction costs associated with an Alliance arrangement. The academician asserts that the presence of opportunisms higher relationship costs making inconvenient Alliance cooperations. However, he strongly

believes that entrepreneurs can affect the way the relationship is shaped, lowering these costs with the generation of “Trust” among actors.

Lack of trust, in fact, is the quintessential cause of transactional costs (Jarillo, 1988).

While many researchers focus on the cooperative aspect of an Alliance, only a few concentrates their studies on the coexistence of both cooperation and competition in order to clarify the opportunistic/competitive behaviors held frequently by firms.

Lin argues that *“cooperation and competition are not extreme end for one dimension, but they are distinctive axis’s that describes the inter-organizational interactive relationships and behavioral patterns”*.

In that way, other practitioners use the term *“Coopetition”*, that was introduced by Brandenburger in his game theory (Nalebuff & Brandenburger, 1996), to illustrate the two dimensions.

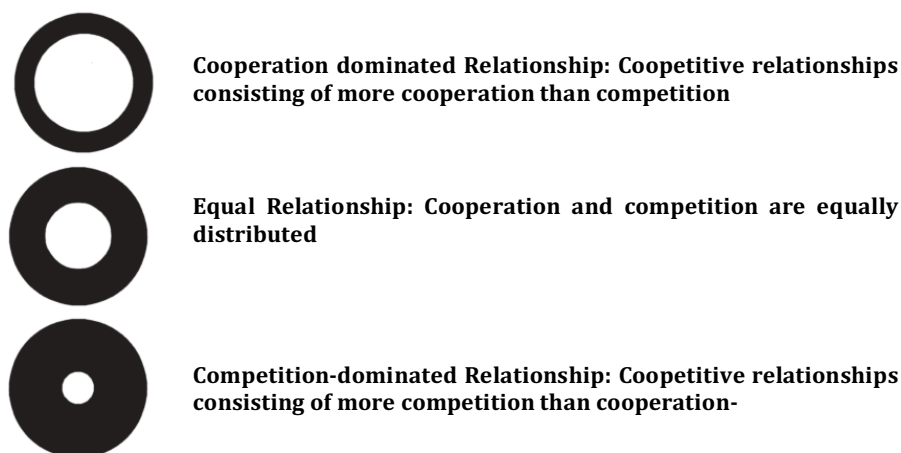


Fig.3.4: Different types of cooperative relationships among firms

Source: Bengtsson & Kock, “Coopetition” in Business Networks, 2000, Industrial Marketing Management

The equilibrium of the Alliance, and the consequent retention of Social Capital as principal resource driving the formation of Networks, is based on the coexistence of cooperative and competitive behaviors.

Now that the dynamics of the Alliances system are clear and the fundamental value of Social Capital is specified tackling both its collaborative behavior and its competitive threats it is possible to clearly define the concept of Strategic Networks, moving the focus to a wider and holistic view of strategic relationships.

3.2.3 Strategic Network definition

The definition of the concepts of Alliance and Social Capital constitute the solid base on which the broader stream of Strategic Network lies; once introduced the field, with an extant literature review on previous studies, in this paragraph, the research work focuses on the definition of Strategic Network.

An increasing number of articles were published in recent years on this topic, due to it's strategic relevance, not only with regard to policy makers of international organization. How to manage, and how to behave in a network could be key success factors also at firm level.

However, Strategic networks' definition lacks in a general accepted conceptual framework (Jarillo, 1988). Jarillo in his paper "On Strategic Networks" attribute such lack of depth in the fact that the concept of network was coined outside the strategy field. This brings strategy scholars to have little use for the concept of network and, seldom, precisely constructed, because it was very hard to harmonize it with the basic postulates of the competitive behavior (Jarillo, 1988).

In his opinion the reason stands exactly in the difficulty to fit networks within the basic paradigm of competitive advantage; probably because of the preeminence of the previous models based on microeconomic theory by Porter (Porter, 1981).

Jarillo theory gives us clues to list the main definitions of Strategic Network:

<i>Strategic Network definitions</i>		
Author	Definition	Year
Lorenzoni	<i>“Product of a determined entrepreneur, bent on obtaining the most efficient organizational arrangement to compete in his or her chosen market”</i>	1982
Miles and Snow	<i>“Something that entrepreneurs use purposefully to obtain a competitive advantage for their firms”</i>	1984
Thorelli	<i>“Intermediate form between “hierarchy” and “market” that bring firms, building lasting relations with other actors, to compete efficiently”</i>	1986
Johanson and Mattson	<i>“Complex arrays of relationships between firms”</i>	1986
Jarillo	<i>“Long-term, purposeful arrangements among distinct but related for-profit organizations that allow those firms in them to gain or sustain competitive advantage vis-à-vis their competitors outside the network”</i>	1986
Gulati	<i>“Networks composed of inter-organizational ties that endure and have strategic significance for the firms entering them”</i>	1998

Tab.3.4: Strategic Network Definitions

Source: Personal elaboration

Lorenzoni described the rich relationships that constitute the networks of firms focusing on how these networks go from a phase of “reaction”, to one of efficiency (Lorenzoni & Lipparini, 1999). Subsequently, Miles and Snow gave a dynamic dimension of networks, considering them the most efficient form of organization for today’s economic circumstances (Miles & Snow, 1984).

Thorelli add numerous clues to the stream, enlightened by the “hierarchy” and “market” theories that were described by Williamson (1975) as modes of organizing economic activities. Thorelli sustains that the competitive advantage originated by networks came from the lowering of the costs of transactions (typical of markets) without incurring large

investments (typical of hierarchies) (Thorelli, 1986). Transaction costs are strictly linked with the firm behavior and will be grasped later on in the review.

During the same year, the focus on the field brings Johanson and Mattson (Johanson & Mattsson, 1987) to further analyze the network redefining the concept of “competition”. They asserted that competing is more a matter of positioning one’s firm in the network that attacking the environment, introducing the concept of cooperative approach among a network.

Jarillo was the first trying to combine all the previous definition insisting in the crucial role of long-term arrangement among organization in order to position them in a stronger competitive stance (Jarillo, 1988).

A decade later, the well known academician Ranjay Gulati (Khanna et al., 1998), took advantage of his research and introduces a “social” perspective to business networks studies, analyzing strategic alliances among firms within a wider network context, highlighting how relationships can affect both the behaviors and performances of companies. He also presents, in his definition, the concept of inter-organizational ties to explain firms’ relationships, trying to give a structure to the network.

In a broad sense, strategic networks facilitate the firm access to information, resources, markets and technologies and help them to take advantage of economies of scale, learning and scope and to share risks.

3.3 STRATEGIC NETWORK STRUCTURE

Many proficient academicians struggled trying to give a structure to the Strategy Network theories framework (Ahuja, 2000; Burt, 1992; Coleman, 1988; Gulati & Nohria, 2000; Gulati, 1995; Jarillo, 1988; Mody, 1993; Walker et al., 1997); this chapter aims at going deeper in detail with the structure of Strategic Networks, illustrating comprehensively the analytic approach adopted to study the link between Network structure and innovation generation and giving pivotal clues for the further development of a model to test empirically the research.

3.3.1 Ties

Several researches argue that the positions of firms in inter-organizational networks influence firm behavior and outcomes. The first pioneers in the field where Shan, Walker, and Kogut; in their empirical study (Walker et al., 1997) they predicted and found a element of a firm's position among the Network that was strictly related to its innovation output: the number of collaborative relationships. They developed also a sophisticated tool able to predict the firms' linkage formation, unfortunately, without going more in detail in the analysis of the connections other than the direct ties.

Two main theories characterized the field concerning the structure of Network ties:

On one hand, Coleman (Coleman, 1988) defines the optimal social structure as the one generated by building dense, interconnected networks. Arguing that, everything else constant, a large, diverse network, is the best guarantee of having a contact present where useful information is aired and, as a consequence, looking at size as the most efficient driver.

These views of densely embedded networks linking firms to the other members of the system are seen as advantageous if networks are considered "closed", such as if every actor in the network is directly linked with all the others. Similarly, Kogut argues that multiple ties reinforce each other and the larger the network, the greater the value generated for its members (Walker et al., 1997).

On contrary, Roland Burt argues that *"more contacts can mean more exposure to valuable information and more referrals but, increasing network size without considering diversity can cripple the network in significant ways. What matters is the number of non-redundant*

contacts". He strongly supports the idea that limiting the ties that lead to the same information benefits will lower the opportunity costs of the linkages bringing a more efficient Network (Burt, 1992, 2002).

As a consequence, his theory affirms that a network constituted principally by indirect ties is the only efficient way to enjoy the benefits of network size without paying the maintenance costs associate with direct ties. These brokerage opportunities derive, so, form an "open" Network structure.

In order to better comprehend the difference between direct and indirect ties and to fully exploit the dynamics of the Network a further analysis is highly recommended.

Ahuja, in his successful academic paper on collaborative networks (Ahuja, 2000), clearly defines the relationship links among firms through a graphic representation, much more effective than a theoretical explanation:

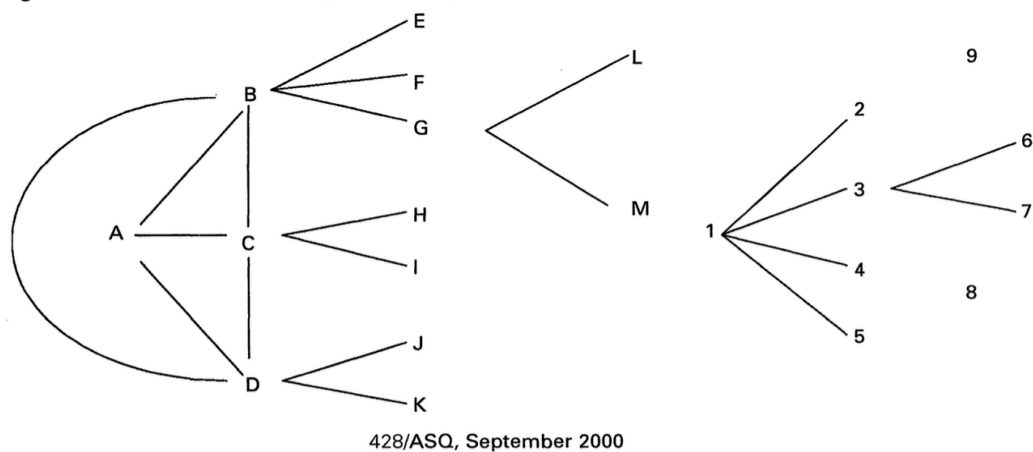


Fig.3.5: Illustration of direct ties and indirect ties.

Source: Ahuja, Collaboration Networks, Structural Holes, and Innovation, 2000, Administrative Science Quarterly

As it is shown in the above picture [Fig.7], firm A has three direct ties (B, C, D) and nine indirect ties (E, F, G, H, I, J, K, L, M), respectively coming from its direct ties B-C-D and from the indirect tie G.

Firm A-B-C-D are all linked together, generating a "closed" network; on the other hand, firm 2-3-4-5 are linked only with 1, generating an "open" system. The firm 1 constitutes a "network focal" of the system composite by 1-2-3-4-5, since all the firms are connected to it. Moreover, going in detail in the analysis of the systems, it is possible to verify that the "letter" network has more direct ties generating an high risk of redundant information

exchange; while, on contrary, the “number” system has a fair level on non-redundancy (Ahuja, 2000).

Ahuja gives a detailed explanation of the benefits coming from direct or indirect ties. He highlights the potential coming from direct ties as a resource-sharing and knowledge-spillover tool, explaining, one more time, how these linkages affects positively the innovative output of firms. He clearly defines three different benefits:

- *Knowledge sharing*: the resultant knowledge coming from a project is available to all partners;
- *Complementarity*: ties facilitate bringing together complementary skills from different firms;
- *Scale*: collaboration allows the exploitation of scale economies in research, thanks to the exponential increase of knowledge coming from bigger projects.

These benefits bring the author to the conclusion that “*the greater the number of direct ties, the greater the firm’s subsequent innovation output*” (Ahuja, 2000).

On contrary, benefits coming from indirect ties are considered on the basis of the focal firm’s existing direct ties. In fact, firms with few direct ties are likely to enjoy greater benefits from the equivalent indirect ones, due to the limited ability to profit from the information coming from them. Hence, “*the greater the number of direct ties, the smaller the benefit from indirect ties*” (Ahuja, 2000).

The academicians Gulati & Nohria, in their strategic examination of Network (Gulati & Nohria, 2000), add to the common benefits coming from ties, a potential dark side coming from the risk of preclusion given by the degree of strength of the tie. Following this alternative perspective, a too strong connection, may facilitate “collusion” among organization, for example enhancing the likelihood of Oligopolistic coordination (Gulati & Nohria, 2000).

The hypotheses proposed by Ahuja are in clear contrast with Burt vision seen before (Burt, 1992). In fact, the researcher Ronald Burt asserts that increasing network size without considering diversity of information normally brings to redundant contacts and consequently to higher costs, focusing on partner selection rather than on Social Capital (Walker et al., 1997).

The example below explains in a clear way, how expanding a Network through similar companies will bring to a considerable increase of connection costs compared to a limited increase in information due to their redundancy.

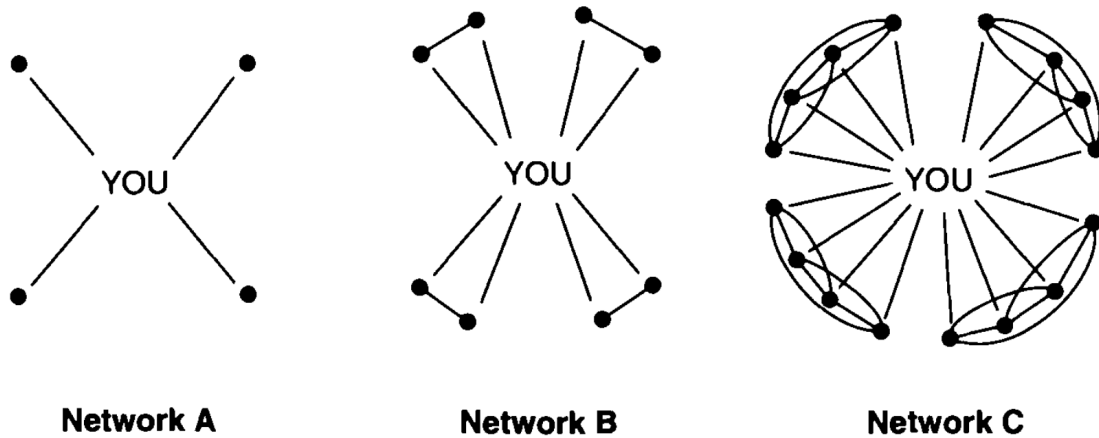


Fig.3.6: Network expansion – Redundancy example

Source: Burt, Structural holes: The social structure of competition, 1992, Networks and Organizations

Burt asserts that a dense Network is inefficient in the sense that it returns less diverse information for the same cost. To solve this inefficiency problem he introduces the concept of “Structural holes” as a relationship of non-redundancy between two contacts (Burt, 1992).

3.3.2 Structural Holes

The concept of Structural holes, which raises a considerable interest in literature (Burt, 2002; Friedkin, 1980; Gulati & Nohria, 2000; Walker et al., 1997), is explained by the absence of two indicators:

- *Redundancy*:
 - *By cohesion*: two contacts connected by a strong relationship;
 - *By Structural Equivalence*: two firms with the same contacts.

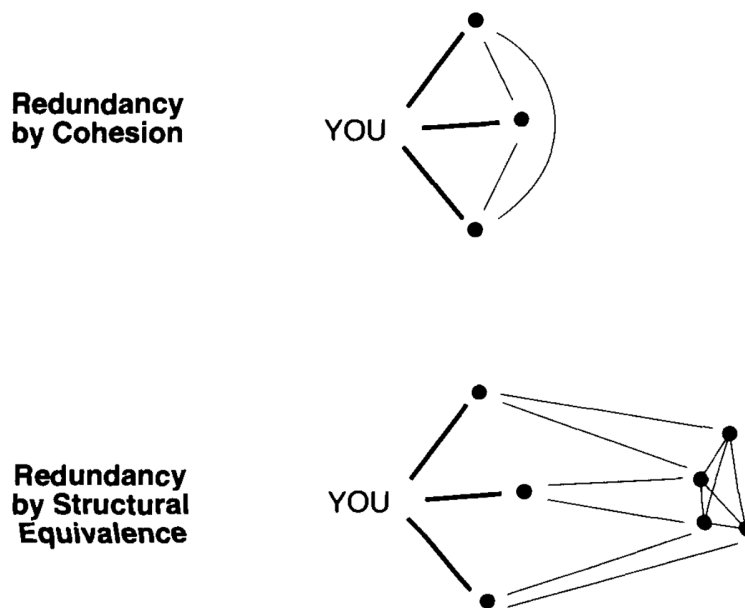


Fig.3.7: Structural indicators of Redundancy

Source: Burt, Structural holes: The social structure of competition, 1992, Networks and Organizations

Both Networks in Fig.3.7 provide one non-redundant contact at a cost of maintaining three (Burt, 1992). As a consequence, the academician Burt, arrives at the conclusion that the maximization of non-redundant contacts, increasing the yield in structural holes per contact, is the only possible way to build efficient Networks, as shown in the figure below (Burt, 1992, 2002).

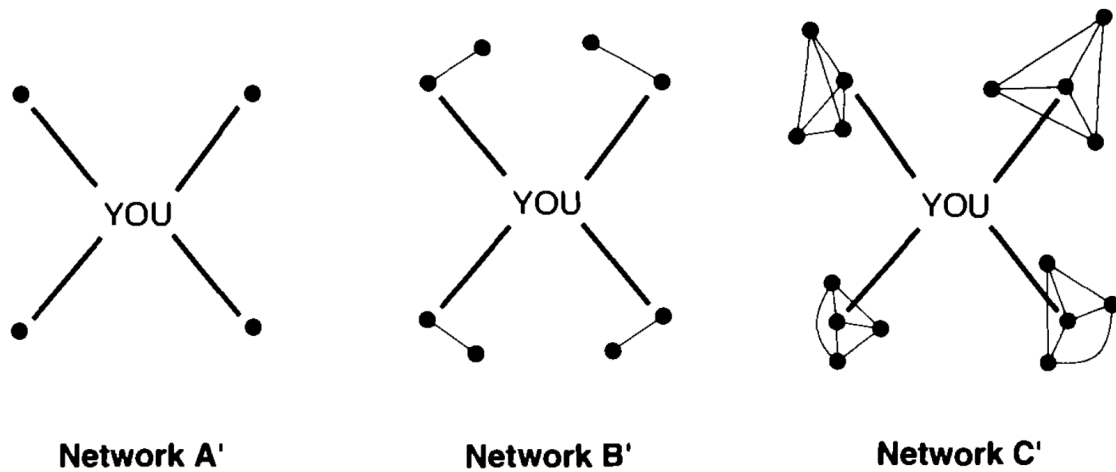


Fig.3.8: Strategic Network expansion – Efficient solution

Source: Burt, *Structural holes: The social structure of competition*, 1992, *Networks and Organizations*

Gulati clarify the concept, defining Structural holes as “the connection of two industry trading partners only through a focal industry” (Gulati & Nohria, 2000).

Burt, in his researches on Network structure (Burt, 2002), gives several clues on how to balance network size and diversity, optimizing structural holes. According to his theory, an optimized network has two design principles:

1. *Efficiency*: the greater the number of non-redundant contacts in the Network, the maximum the yield in Structural holes per contact;
2. *Effectiveness*: distinguish primary from secondary contacts and focus resources on preserving the primary contacts.

Where efficiency concerns the average number of people reached with a primary contact, effectiveness focuses on the total number of people reached with all the primary contacts (Burt, 1992).

In addition, the academician Granovetter affirms that the spread of information on new ideas and opportunities must come through the weak ties that connect people in separate clusters, introducing the similar concept of “Weak Ties”. A “weak tie” is defined by Granovetter (M. S. Granovetter, 1973) as a crucial bridge between two clusters of relationships.

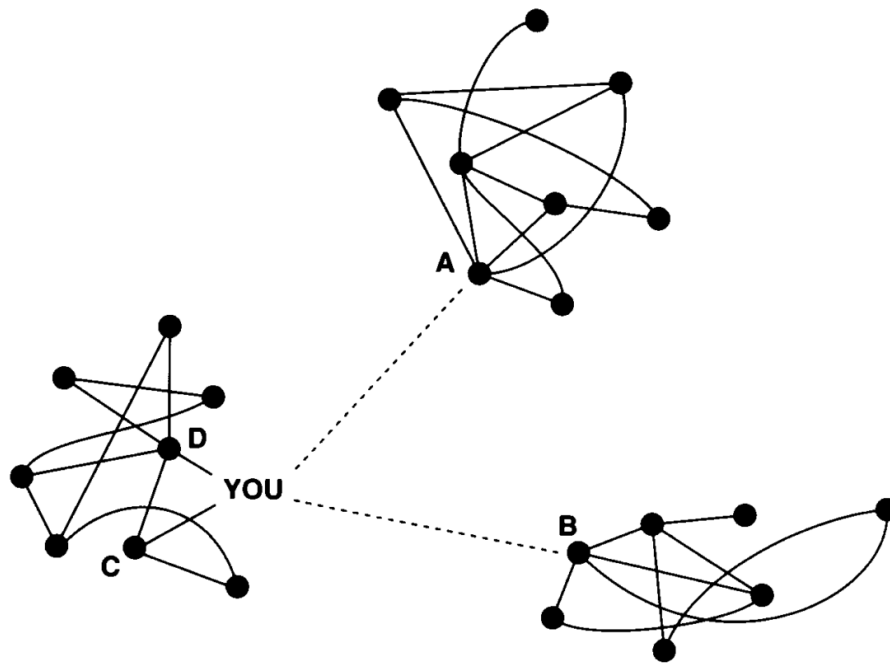


Fig.3.9: Weak Ties – dotted lines

Source: Burt, *Structural holes: The social structure of competition*, 1992, *Networks and Organizations*

Fig.3.9 shows the crucial bridges formed by weak ties (YOU-A; YOU-B) identifiable by dotted lines. Even if contextualized to the labor market, the contribution made by Granovetter is that he argues that each “social system” includes among it many clustered subsystems isolated from each others, and a lack in weak ties connecting them will generate fragmented and incoherent ecosystems, insulating them from innovation (M. S. Granovetter, 1973).

Although, the concepts of Structural Holes and Weak Ties could seem to describe the same phenomenon there are a few differences:

	Structural Holes	Weak Ties
Causal Agent	<i>Structural hole span</i>	<i>Weakness of a tie</i>
Benefits	<i>Control benefit + Information benefit</i>	<i>Information benefit</i>
Bridge definition	<i>Chasm spanned</i>	<i>The strength of relationships that span the chasm</i>

Tab.3.5: Structural holes vs Weak Ties

Source: Burt, *Structural holes: The social structure of competition*, 1992, *Networks and Organizations*

The Structural holes’ theory considers the tie weakness just a correlate, not a cause. Moreover, in the Weak ties theory there isn’t a clear referral to the Control benefit, which is the advantage in negotiating the relationships coming from the information benefits of a tie, usually derived by Burt’s concept of structural holes.

Finally, there is a slightly difference in the definition of the “bridge” tie that link different clusters; While Granovetter considers it related to the strength of relationships among firms, Burt focuses on the chasm spanned, considering it the generator of information benefits (Burt, 1992, 2002; Friedkin, 1980; M. S. Granovetter, 1973, 1983).

All the previous considerations on collaborative ties, coupled with the aspects concerning dense and sparse Networks, give to the research a structural insight crucial for the understanding of the strategies each firm can apply to reach better performance results, and it’s a useful base for the development of the Network evaluation model that will be built in the empirical part of the research.

3.3.3 Trust

The first considerations on “trust” belong to Alliance theories, grasped in the previous chapter as Strategic Network prelude. Crucial aspect of Strategic Alliance theories is the flexibility and “informal” nature of relationships among firms. The principal “glue” element that allows such unstable complex and dynamic systems to strive is Trust. Trust building between entrepreneurs is crucial.

The development of trust among members of Alliances has been widely recognized as a fundamental issue for the establishment of effective relational ties (Parkhe, 1998; Zaheer et al., 1998).

Growing amount of attention has been paid to the subject of trust between firms within the same and different organizations (Dirks & Ferrin, 2001; Gulati, 1995; Zaheer et al., 1998).

The academician Zaheer (Zaheer et al., 1998) define trust as: *“the expectation that an actor can be relied on fulfill obligations, will behave in a predictable manner, and will act and negotiate fairly when the possibility for opportunism is present”*

Similarly, Thorelli (Thorelli, 1986) gives this definition: *“Trust is an assumption on the part of A that if either A or B encounters a problem in the fulfillment of his implicit or explicit transactional obligations, B may be counted on to do what A would do if B’s resources were at A’s disposal”*.

These definition are integrated by Coleman (Coleman, 1988); in his studies, he stresses the concept of trust and shared norms of behavior, affirming that without those, any kind of joint investments are likely to be difficult and unproductive in any context.

The development of trust and the reduction of opportunism are then likely to be necessary preconditions for successful resource sharing.

With another perspective, Burt emphasizes the importance of confidence in the information passed and the care with which contacts look out for it, linking it with the social structure of imperfect competition (Burt, 1992).

Some other researches highlight the need to distinguish between inter-personal and inter-organizational trust. In accordance with this approach, trust among partners has a considerable impact on their respective firm's performance. It is due to the reduction of conflicts and of transaction costs and other direct outcomes such as greater ROI or increased sales (Luo, 2002; Zaheer et al., 1998). Being able to generate trust is the fundamental entrepreneurial skill to lower those costs and create economically feasible network.

Driscoll (Driscoll, 1978) introduces an intra-company view finding evidence that a trustful environment is more important for satisfactory work conditions than the participation in decision-making processes. Moreover, some empirical studies point out that an atmosphere of trust is actually conducive to a more efficient problem-solving approach (Boss, 1978).

All these academic findings, give us the perception of how important is the proliferation of trust in an entrepreneurial context; however, to understand how trust can be generated we have to act on two variables: the assumption of the owner of the resources regarding the entrepreneur's motivations and intrinsic situation.

It is possible to face the first variable by carefully choosing the partners, explicitly searching for people the entrepreneur can "relate to"; and the second one by showing evidence that the entrepreneur would be worse off if he behaved opportunistically (Jarillo, 1988).

Some researches (Antoldi et al., 2011) highlight three main constraints that discourage firms to establish collaborations:

1. *Risk of opportunism;*
2. *Low commitment from counterparts;*
3. *Wrong culture of the actors involved.*

A long-term trustful vision is, therefore, the only possibility for enhancing healthy Network generation (Jarillo, 1988).

Trust is the critical underlying concept that bridges a static structural analysis into a more dynamic meaning. In fact, it can be considered as an element strengthening structurally relationship linkages, allowing to fill structural holes and overcome structural equivalences losses; as well as, introducing a more dynamic concept of lock-in & lock-out effect due to the assessment of trustful behaviors or the assessment of the lack of those ones.

3.3.4 Network Dynamics

In the previous paragraph, a structural outline of a Strategic Network is given, taking into consideration the positioning of the firms and the kind of ties that relate them, in order to consolidate the direct link between the Network and the strategic choice of an organization.

Researcher Gulati introduces a dynamic approach aiming at studying the endogenous causes that influence the competitive advantage enjoyed by firms over time (Gulati & Nohria, 2000). Either endogenous, either exogenous dynamics can have significant consequences on organizations' performances but since the second ones are mainly related to environmental changes, the research focused on the firsts (Ghezzi et al., 2014). The two main phenomena grasped by academician are:

- *Lock-in/Lock-out effects:*

Lock-in/Lock-out effects are restriction in future allies' formation, generated when forming ties with one actor place constraints on ties with others. There are two kinds of constraints:

1. *Resource & time constrains:* since any actor has limits on the resources it can devote to an ally, making choices to tie with some partners exclude others;
2. *Fidelity/Loyalty expectation:* these monogamous behaviors usually precludes parties to ally with similar others. Even if such exclusive stipulations are not explicitly specified.

To avoid this phenomenon, organization should be the more flexible possible and have a portfolio of alliances.

- *Learning Races:*

Learning races are competitive behavior that brings firms to an opportunistic conduct. It usually happens when the property rights associated with alliance output and profits may not be well defined (Baum et al., 2000). This phenomenon can be analyzed following two levels:

1. *Dyad level:* looking at each singular relationship, in some situations partners may find themselves engaged in a race to learn or exploit as much as they can the other's assets and, then, exit the alliance; finding more helpful for them to have opportunistic behaviors than share a Social capital and collaborate (Baum et al., 2000; W. Cohen & Levinthal, 1990; Mody, 1993).
2. *Portfolio level:* considering each partner's portfolio of other activities outside the alliance brings to reflections concerning the relative scope of each relationship. If a company has only one alliance and no other business segments where to exploit its knowledge, it is likely to learn quick and bail out of the alliance (Khanna et al., 1998).

However, the focus on the dynamic part of the Network has been tackled only in the last years and the material literature material available is illustrative rather than comprehensive, giving some insights for future developments (Gulati & Nohria, 2000).

This chapter explains how Entrepreneurial Ecosystems can be analyzed with a strategic approach, highlighting the structure of the Networks formed among firms, and the dynamics behind their behaviors.

However, the fragmented literature on the specific field and the continuous striving toward more complex, multi-level models of strategy, brings to a research for new methodological inputs from other fields of Management able to offer a complete tool for the analysis (Arthur & Borch, 1995).

The underlying struggle of academicians in defining clearly the nature of the exchanges between organization and the difficulty in link the strategic choice of a firm with the resulting value generated, allows the research to integrate the Strategic Network studies, with a comprehensive overview on Value Network and Business Model theories; with the aim of offering a clearer approach to the evaluation of Entrepreneurial Networks.

3.4 VALUE NETWORKS

The previously highlighted struggles concerning the assessment of value generated through the different strategic choices implemented, give several clues for the introduction, in the paragraph below, of the original analysis of Value Networks.

3.4.1 Overview

Before analyzing in detail the Value Network theory, with particular reference to the model developed by its main contributor Verna Allee, the research work presents a review on previous studies, that in different ways have had a considerable influence on it.

Allee defines organizations as truly complex systems, in which there are too many variables that simply cannot be controlled (Allee, 2002).

For this reason she propose a new perspective to analyze firms' activities that will result far more productive: a living system perspective (Allee, 2002, 2011).

Arising from physicist Fritijof Capra, Living Systems are defined though three criteria as pattern, structure and process:

1. The pattern of organization is the configuration of relationships among system's components which determine its essential characteristics;
2. The structure of the system is the physical embodiment of its pattern of organization;
3. The process of a living system is the activity involved in the continual embodiment of the system's pattern of organization.

These approach represents a decided shift away from mechanistic models and highlights the importance of relationships' network; in fact, a truly dynamic whole system of the enterprise extends far beyond the traditional boundaries of the company (Allee, 2000b).

From a living systems perspective, the molecular level of economic activity is the exchange. Living networks, including companies and business webs, are engaged in more than material exchanges. A sustainable business success, in fact, depends on exchanges of information, knowledge sharing, and open cognitive pathways that allow good decision-making (Allee, 2002).

Moreover, Allee affirms that these exchanges not only have value, but are essential for the success of the enterprise, so they must also be considered as strategic economic exchanges (Allee, 2002), giving insights for a collocation of the theory stream in a strategic context.

Many practitioners highlight the importance of such a new, and more complete, way of considering exchanges both on a tangible, both on an intangible nature (Allee & Schwabe, 2009; Allee, 2000a, 2000b, 2002, 2008, 2010, 2011; Brooking, 1997; Chen et al., 2006; Edvinsson & Sullivan, 1996; Edvinsson, 1997; Stewart, 2013).

The emerging business model of value creation would include both social and environmental concerns and the other categories of human competence, internal structure and business relationships. Thanks to this shift, the usual consideration of firm network becomes more focused on business relationships considering also suppliers and Strategic Alliances (Allee, 2000b).

This broader views of Organizational business and Network bring to an innovative definition of Value for companies as: “*Tangible or intangible good or service, knowledge, or benefit that is desirable or useful to its recipients so that they are willing to return a fair price or exchange*” (Allee, 2000b).

Recent studies (Wild, 2009) place intangible value, such as reputation, social capital, and human competencies at 50-70% of company value.

However, management methods concerning intangible generation and leveraging are poor or non-existent (Gordon-Miller, 2004). Some have attempted to understand intangible value creation as a type of value chain (Lev, 2001) but the value chain model is fundamentally limited in understanding value as a dynamic system or model. On contrary the Value Network analysis is oriented toward a complex adaptive system view of value creation (Allee & Schwabe, 2009).

A Value Network, in fact, generates value through complex dynamic exchanges between one or more enterprises, its customers, suppliers, strategic partners, and the community. These networks engage in more than just transactions around goods and services; they exchange also knowledge value and intangible value (Allee, 2000a).

In order to better understand when intangible assets were first considered and what they precisely refer to; in the next paragraph the research will illustrate comprehensively all the historical findings and previous attempts to define and model them.

3.4.2 Intangibles & Intellectual Capital

Historically, the idea of “intangibles” was introduced by Karl-Erik Sveiby with the concept of Intangible assets to managers in the North of Europe (Sveiby & Risling, 1986). From 1986, the understanding of Intangibles among practitioners has taken dramatic steps forward.

Among many different interpretation of the argument, Intellectual Capital methods introduced by the same Karl-Erik Sveiby (Sveiby, 1997) and Leif Edvinsson (Edvinsson, 1997, 2000) are considered two of the most successful. Simultaneously, in the USA the concept of intangibles was introduced by Norton and Kaplan (Norton & Kaplan, 1996) with the concept of “balanced scorecard” that gives strategic indicators regarding the performances of a company taking into consideration financial and non-financial inputs. Other important contributors in the field, aiming at the integration and clarification of the concept of Intellectual Capital are Annie Brooking (Brooking, 1997), Pat Sullivan (Harrison & Sullivan, 2000; Sullivan & Sullivan Jr, 2000; Sullivan, 2000) and Nick Bontis (Bontis, 2001), giving a useful review of the models and highlighting pros and cons of each one. Some other academicians used a different approach to drive intangible analyses based on the concept of Knowledge management (Allee, 2000a; Green & Ryan, 2005; Wiig, 1997).

With the objective of analyze the evolution of Intellectual Capital during the years, the most known definitions are summarized below:

Intellectual Capital definitions		
Author	Definition	Year
Tom Stewart	<i>“Intellectual material, Knowledge, information, intellectual property and experience, that can be put to use the create wealth”</i>	1997
Leif Edvinsson	<i>“The possession of knowledge, applied experience, organizational technology, customer relationships, and professional skills that provides a firm with a competitive edge in the market”</i>	1997
Annie Brooking	<i>“The difference between the book value of the company and the amount of money someone is prepared to pay for it. It represents intangible assets which frequently do not appear on the balance sheet”</i>	1998
Larry Prusak	<i>“Intellectual material that has been formalized, captured, and leveraged to produce a higher-valued asset”</i>	1999
Ted Lumley	<i>“Knowledge used to increase economic order in the business process”</i>	1999
Gordon Petrash	<i>“Knowledge with potential for value”</i>	2000

Tab.3.6: Intellectual Capital Definitions

Source: Personal Elaboration

Intellectual capital theory was developed to answer to the new needs of companies that derive their profits from innovation and knowledge-intensive services called “Knowledge firms” (Edvinsson & Sullivan, 1996). Knowledge companies base their value in their intangible intellectual assets as well as their ability to convert those assets into revenues.

A research driven by Baruch Lev (Lev, 2001) on USA and Sweden shows that the dominant investments in those economies go into intangibles, such as R&D, education and competencies, IT software and the Internet.

Moreover, the flow is increasingly going digital in the form of e-commerce changing the way value creation is done. The Value creation is going to be in shaping new ideas,

exchanging information globally, and interacting through networks with high organizational speed in order to take action (Edvinsson, 2000).

Leif Edvinsson, the most important practitioner on the field and the first Intellectual Capital manager of the history at Skandia Assurance and financial services, integrate his definition of Intellectual Capital, arguing that it is a stock of focused and organized information that the organization can use for some purpose (Edvinsson & Sullivan, 1996). Moreover, he asserts that the ability of company to leverage their Intellectual Capital is the greatest key to profitability. He distinguishes two major components of Intellectual capital (Edvinsson, 2000):

1. Human resources:

defined as the collective capabilities of employees to solve customer problems. The firm-wide human resource is the know-how and its group collective experience and skills

a. Intellectual assets:

Codified, tangible, or physical descriptions of specific knowledge to which the company can assert ownership rights and that they can readily trade in disembodied form. They are the source of innovations that the firm commercializes and are likely to be legally protected

	Human resources	Intellectual Assets
Examples	<ul style="list-style-type: none"> ▪ Experience ▪ General Know-how ▪ Skills ▪ Creativity 	<ul style="list-style-type: none"> ▪ Technologies ▪ Inventions ▪ Processes ▪ Data ▪ Publications ▪ Computer Programs
Repository	<ul style="list-style-type: none"> ▪ People and organizational routines & procedures 	<ul style="list-style-type: none"> ▪ Tangible form (documents)
Protection Methods	<ul style="list-style-type: none"> ▪ Umbrella agreements between employer and employee ▪ Contracts 	<ul style="list-style-type: none"> ▪ Patents ▪ Copyrights ▪ Trade secret laws

Tab.3.7: Human Resources vs Intellectual Assets

Source: Edvinsson, Developing a model for managing intellectual capital, 1996, European Management journal

2. Structural Capital:

Firm's supporting infrastructure in order to commercialize their human capital and maximize the intellectual output. Complementary business assets are structural capital assets of the firm used to create value in the commercialization process.

The major task of an Intellectual Capital manager will be to transform human resource assets into Structural Capital ready to be commercialized. The entire process of transformation ends with the Value Creation inherent in the innovations themselves and in the conversion by firm's structural business assets (Edvinsson, 1997).

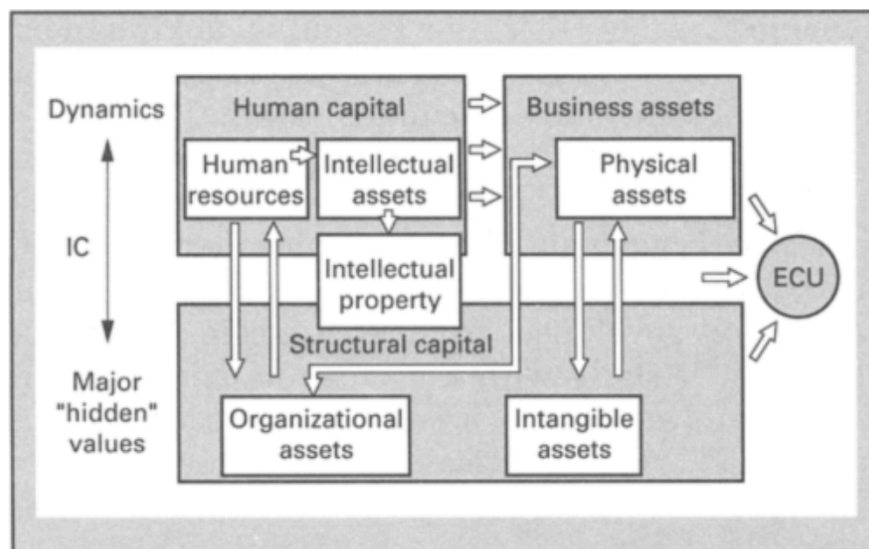


Fig.3.10: Intellectual Capital management process

Source: Edvinsson, Developing intellectual capital at Skandia, 1997, Long Range Planning

The IC manager Edvinsson developed a model to spread this concept inside his company called "The Skandia Navigator" that became quickly the manifesto of Intellectual capital management (Edvinsson, 1997).

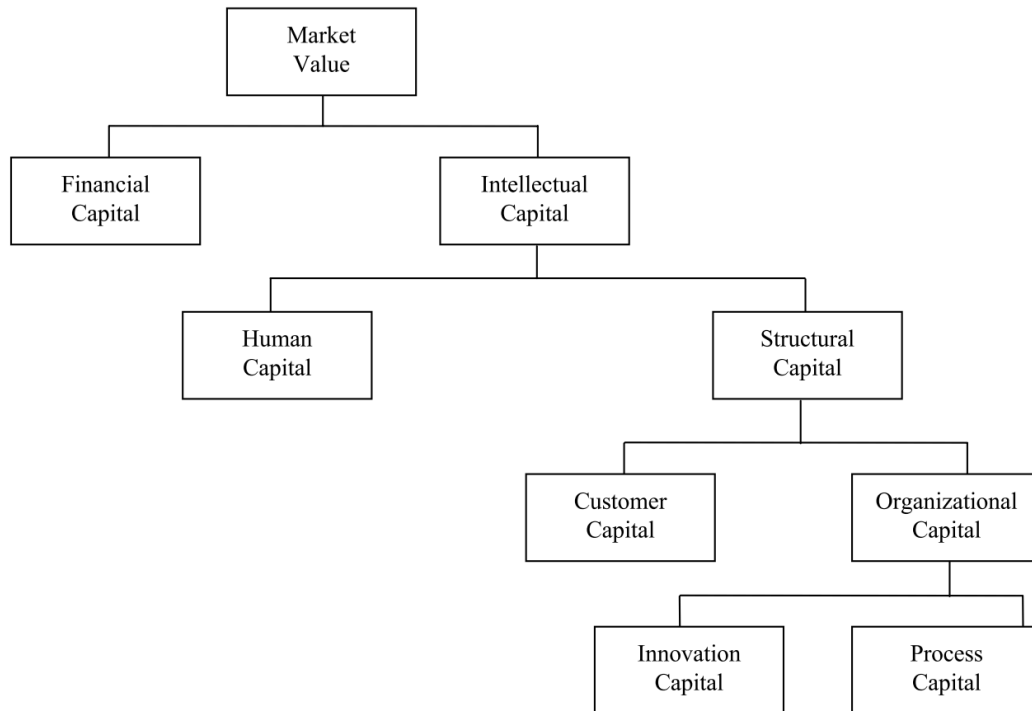


Fig.3.11: Skandia's Value Scheme

Source: Edvinsson, Developing Intellectual Capital at Skandia, 1997, Long Range Planning

The model is particularly impressive in recognizing the role of intangible capital in creating value for an organization and pointing out the very nature of customer relationships; however, it assigns no dollar value to its IC, but uses only proxy measures to track trends in the assumed value added. Moreover the focus inside the company itself does not allow an illustration of comparable generic standards to evaluate broader Networks (Bontis, 2001).

Simultaneously, Annie Brooking makes a practical contribution to IC measurement by offering three measurement models to help calculate the dollar value of Intellectual Capital in her audit model called "Technology Broker". She defines IC as the combination of four components: market assets, human-centered assets, intellectual property assets and infrastructure assets. Her model consists in specific audit questionnaires on each component, which are used to calculate the dollar value of Intellectual capital using a cost or market approach (Brooking, 1997).

Many researchers lauded the Technology Broker approach for offering a toolbox for organizations to assign value to IC (Lynn, 1998). However, the main weakness is that there is a considerable leap between the results of the questionnaire to actual dollar values for these assets (Bontis, 2001).

More recent studies gave useful insights focusing on Intellectual ecosystems at a community, regional or national level; adapting previous models for IC measurement from a micro-organizational level to the macro-national and regional levels. These researches added to the concept of Intellectual Capital broader characteristics like sustainability, ecology and wealth creation in order to create a more holistic view of the national innovation capacity.

Among this new current, noteworthy is the Triple Helix Model developed by Etzkowitz in response to the need for a clarification regarding the transformation process in university-industry-government relations (Etzkowitz, 2003; Leydesdorff & Etzkowitz, 1998). The Triple Helix model combines the three entities representing the exchanges of IC among them, through the generation the hybrid organizations. The model is sufficiently complex to encompass the different perspectives of participant-observers and, from an analytical perspective, to guide entrepreneurs heuristically in searching for options emerging from the interactions (Leydesdorff & Etzkowitz, 1998).

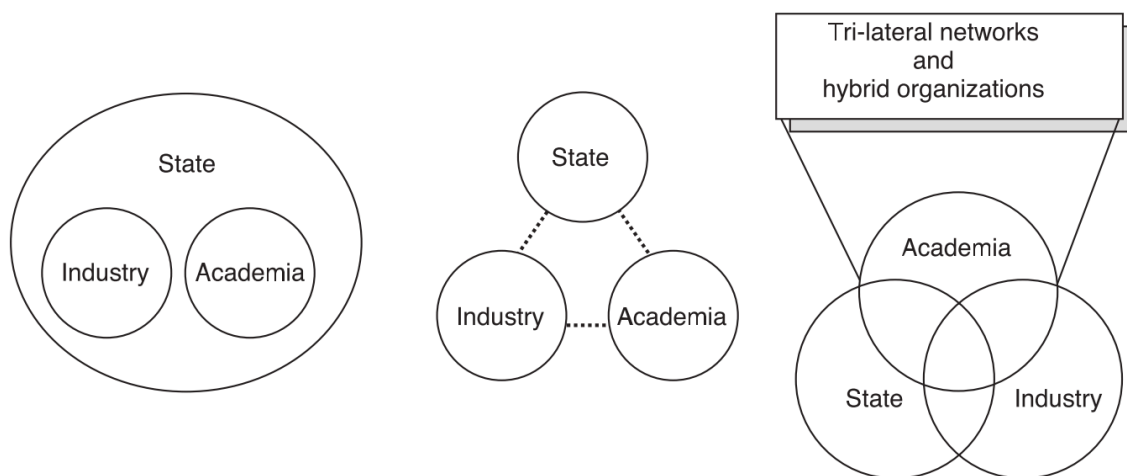


Fig.3.12: Evolution of IC exchanges among institutions: from Etatistic to Triple Helix
 Source: Etzkowitz, *Innovation in Innovation: The Triple Helix*, 2003, *Social Science Information*

The same Edvinsson, in his last studies, underlines the link between important social changes, such as the rise of the knowledge economy and the increasing network dimension of society, and the changing perspectives of IC leaving space for higher forms of capital such as the Social Capital we discussed in the previous chapter (C. Lin & Edvinsson, 2012).

A revolutionary approach is given by Verna Allee, who adds a third category to the Intellectual Capital definition. Other than Human capital and Structural capital she

considers noteworthy the Customer of External Capital, defined as “*alliances and relationships with customers, strategic partners, suppliers, investors and the communities. Including brand recognition and goodwill*” (Allee, 2000b).

Allee include in the Intangible assets definition the relationships among firms and, especially, the level of trust between the people of organizations forming the relation (Allee, 2008). She also integrates the concept of intangibles as negotiable forms of value and as deliverables, to the concept of Intangibles as assets in order to give a comprehensive definition of the concept. Moreover, extremely innovative is her perception of IC valuation. The merely monetary valuation of things is a limited view of business success; there must be an evolution of the framework to an expanded view of potential value domains. She asserts, in addition, that the control mindset of process thinking must move to the more organic worldview that comes with true system thinking (Allee, 2000b).

When every indicator of success regarding intangibles is devein to a financial measure, the other ways of thinking about wealth and value remains without consideration.

In order to clarify her concepts, academician Allee proposes an innovative representation of Enterprise value model where intangibles are definitely assets that contribute to our business and economic success at both the company and country level:

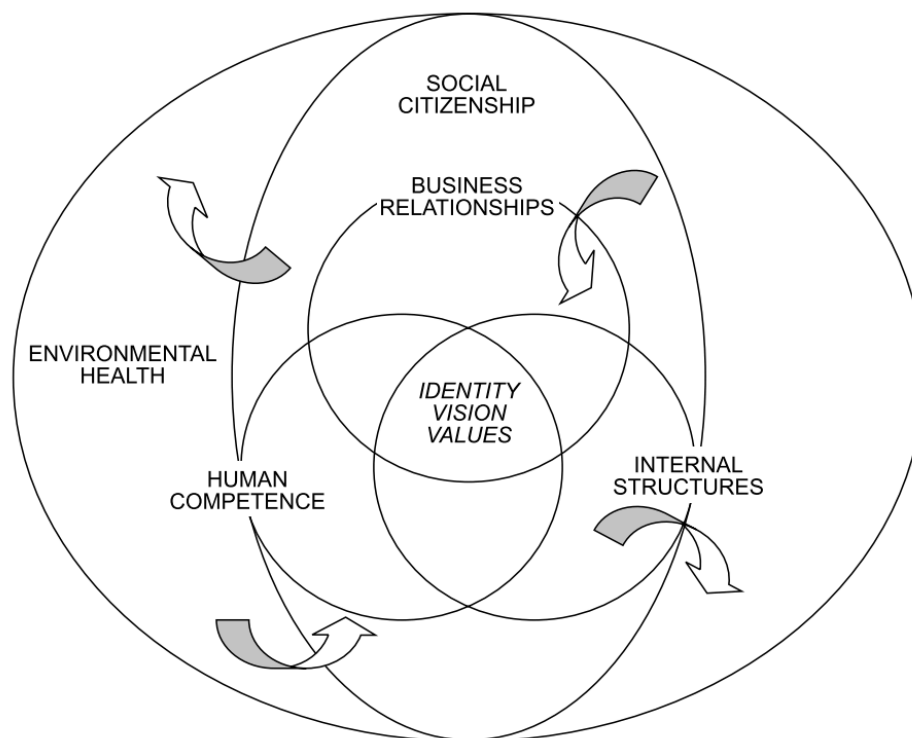


Fig.3.13: Expanded view of Enterprise Value domains

Source: Allee, VN analysis and value conversion of tang. and intang. assets, 2008, *Journal of I.C.*

Fig.3.13 shows in detail each value domain and the dynamic value exchanges between them, embedding intangible assets into the structure of the enterprise with the aim of enlarging their boundaries. This expanded view of Intellectual Capital aims at redefining value and wealth both at the business level and at the Macro-economic level (Allee, 2000b).

This effort is made to shift the common view of business from the value chain approach, to the more dynamic world of the Value Network.

3.4.3 Value Networks theory: an innovative approach

The previous chapter clarified the concept of Intangibles & Intellectual Capital and introduced the context that brings to a revolutionary shift in the conception of Business Evaluation. This paragraph aims at define clearly the concept of Value Network developed by Verna Allee, and the link it has with the strategic approach to evaluate Entrepreneurial Networks.

A Value Network can be defined as: *“Any web of relationships that generates tangible and intangible value through complex dynamic exchanges between two or more individuals, groups, or organizations”*.

The definition itself allows a more straightforward approach in linking Network analysis and organizational performance, thanks to the expanded view of network analysis (Allee, 2009).

Joe Peppard, in his paper “From Value Chain to Value Network” (Peppard & Rylander, 2006) argues that this approach drives organizations to focus on the value-creating system itself, within which different economic actors (suppliers, partners, allies, and customers) work together to co-produce value in a strategic way.

Seeing businesses as an ecosystem, as it is partially done in Strategic Networks, means thinking about relationships differently, and offers an opportunity to reframe a business or redefine its role. Allee gives the example of Cisco, the dominant company in Internet routers. They completely changed the rules about knowledge sharing with partners and customers, enhancing a development of intangible values and garnering huge attention for the phenomenal success of its business model (Allee, 2011). Their Intangible exchanges outnumber key tangible ones by two to one, making a traditional analysis based on money and goods revenues obsolete and misleading, as it is possible to verify in the maps below.

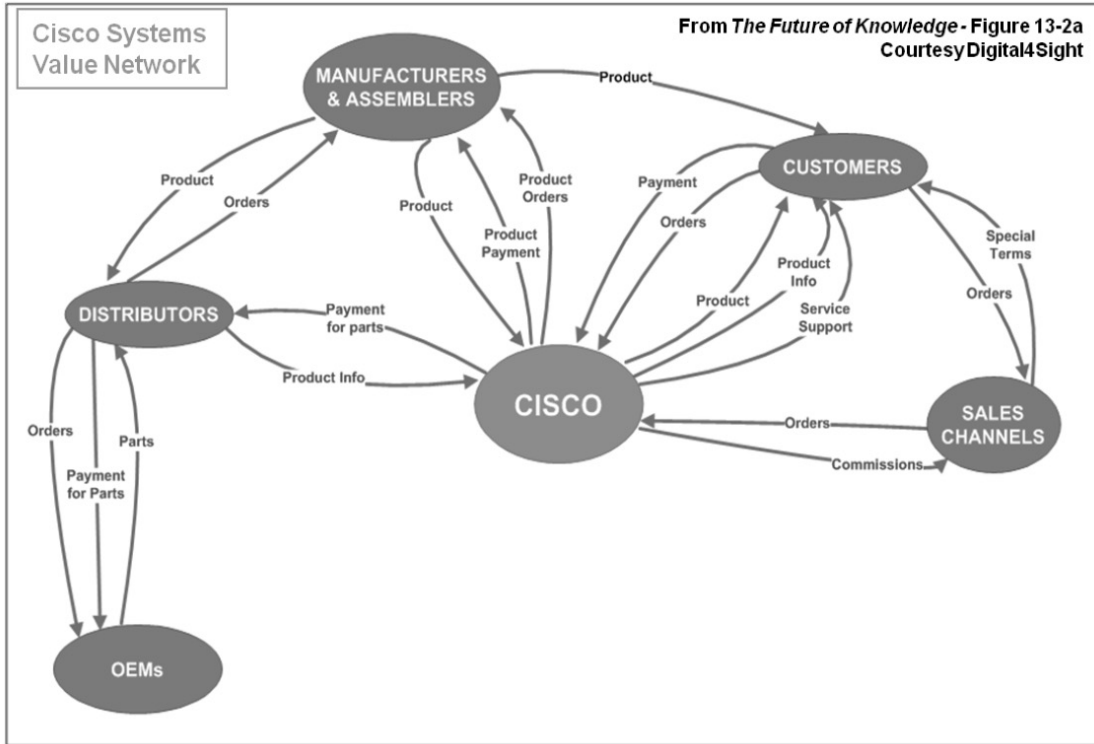


Fig.3.14: Cisco Systems value map – only tangible exchanges

Source: Allee, Value Network Examples, 2011, The future of knowledge: Increasing Prosperity through VN

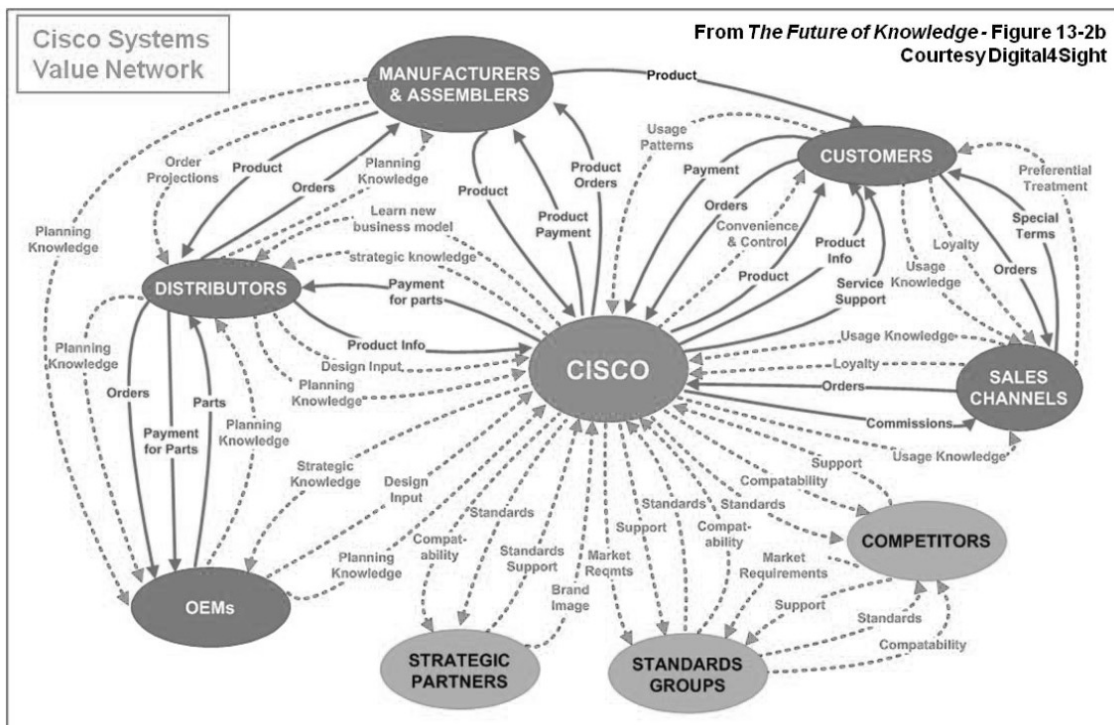


Fig.3.15: Cisco Systems value map – tangible and intangibles exchanges

Source: Allee, Value Network Examples, 2011, The future of knowledge: Increasing Prosperity through VN

As previous figures show, external-facing Value Networks include those between the organization and its suppliers, its investors, its strategic business partners and its customers. As long as the principles of a healthy value network are followed, the network will be sustained and fulfill its purpose (Allee, 2008).

Allee gives a great contribution in clarifying the link between Strategic Networks and the performances related to Value generation among companies, asserting that a business strategy requires the understanding of the shared purpose and value of the Network, then carefully selecting the roles that actors chooses to play in it (Allee, 2008). Her theories, in fact, allow a strategic evaluation of company's performances through the evaluation of value generated, exchanged and captured.

One of the most important aspects of the networked economy is its dynamic nature. An action by one participant in the Network can influence other members, for that reason in analyzing a Network all aspects must be included (Peppard & Rylander, 2006). The whole-system approach to modeling business dynamics, based on the principle of exchange, allows us to explore not just a few organizational forms, but thousands. It also serves as a strategic tool to understand where a firm has to act in order to expand its capacity for true system thinking and knowledge creation to better evaluate entire business ecosystems (Allee, 2011). Furthermore, with a Value Network perspective, entrepreneurs can gain new insights into managing their own organizations more effectively, finding pathways to generate greater value for their own benefit and for the one of the entire network.

Value Networks are complex systems; whenever there is a transaction, there is an intricate exchange of Value. For that reason, academician Allee proposes an accurate model to describe, analyze, evaluate, and improve organizational performances through her Value Network Analysis (VNA) (Allee, 2000a).

3.5 VALUE NETWORKS ANALYSIS (VNA)

This paragraph will go through a detailed exposition of the rules and representation of the Value Network model. The Value Network Analysis proposed by Verna Allee is an integrative modeling language oriented toward a complex adaptive system view of value creation. The model is composite by two distinct phases:

1. Value mapping:

A graphic representation of the Network relying on three simple elements (Allee, 2002, 2008):

- Roles*: organizations who provide contributions and carry out functions, represented by ovals;
- Transactions*: activities, tangible or intangible, that originate with one player and ends with another, represented by arrows;
- Deliverables*: the actual “things” that move from one role to another, represented by labels on the arrows.

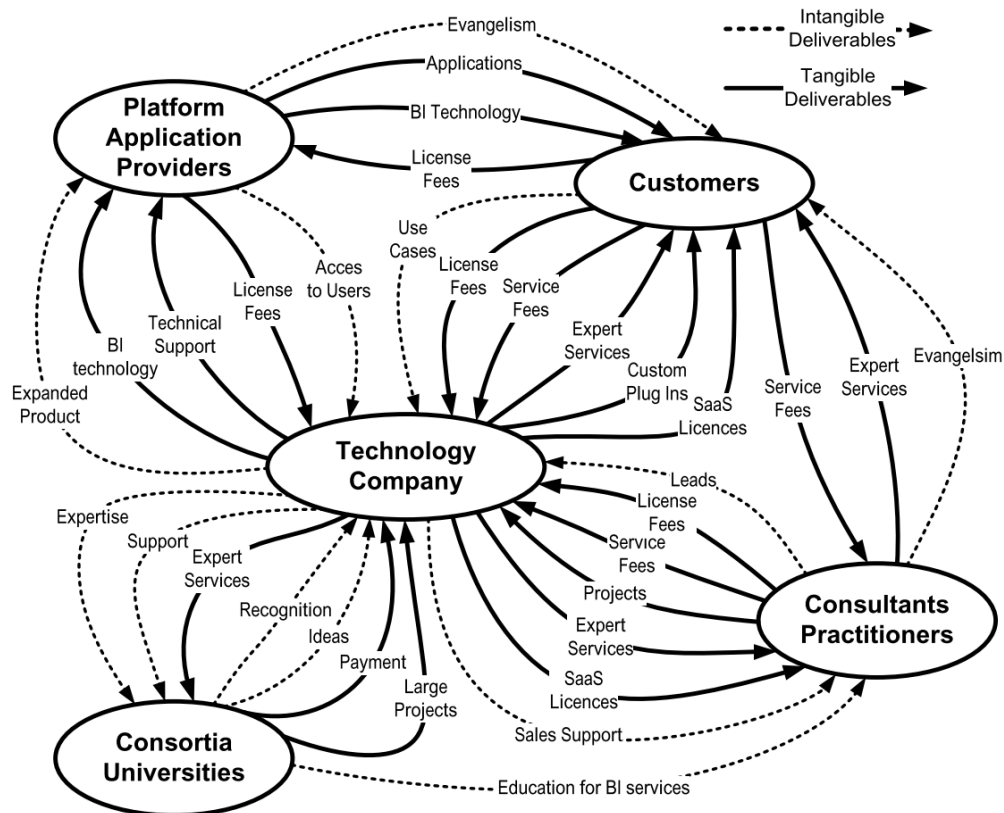


Fig.3.16: Value Network map – example of a Technology company

Source: Allee, VNA and value conversion of tangible and intangible assets, 2008, Journal of IC

The above example (Allee & Schwabe, 2009) represents the three elements all together in a typical value map representation with tangible exchanges represented with a continuous arrow and intangibles with a dotted one.

2. Value Network Analysis:

Analyzing the Network requires addressing three different analyses corresponding to 3 basic questions (Allee, 2008, 2011):

1) Exchange analysis:

What is the overall pattern of exchanges and value creation in the system as a whole?

2) Impact analysis:

What impact does each value input have on the roles involved in terms of value realization?

An impact analysis shows whether a role is realizing value from the inputs it receives.

Input	From	Activities generated	Tangibles Impact	Intangibles Impact			Cost/Risk	Benefits
				Customer Capital	Human Competence	Internal Structures		

HIGH = H MEDIUM = M LOW = L

*Tab.3.8: Impact analysis table
Source: Personal elaboration*

3) Value creation analysis:

What is the best way to create, extend, and leverage value, either through adding value, extending value to other roles, or converting one type of value to another?

Value creation analysis is focused on the value creation and output of each role.

Output	Goes To	Value Enhancements or Value Added	Cost/Risk	Benefit

Cost/Risk & Benefits: HIGH = H MEDIUM = M LOW = L

*Tab.3.9: Value Creation Analysis
Source: Personal Elaboration*

The principal benefits of the Value Network analysis can be schematized as following:

- It provides a fresh perspective for understanding value creating roles and relationships, both internal and external, upon which an organization depends;
- It offers dynamic views of how both financial and non-financial assets can be converted into negotiable forms of value that have positive impact on those relationships;
- It explains how to more effectively realize value for each role and how to create value from intangibles and tangibles;
- It move network analysis from being an expert analyst's tool to an organizational design tool;
- It fills the managerial and analytical gap between other organizational tools.

3.6 BUSINESS MODELS

In order to integrate the strategic choice made among entrepreneurs with their final performances and value generated in a more detailed and comprehensive way, in this chapter, the research focuses on the concept of Business Model.

The analysis of the meaning and the structure of a Business Model, always more embedded in Digital contexts nowadays, clarifies and organizes all the processes that bring a firm to strategically generate value among its Network (Shafer et al., 2005). It will be a bridge to further ease the transition between the concept of Strategic Networks and Value Network.

3.6.1 Definition

Among researchers, there is an underlying non consensus regarding the definition, nature, structure, and evolution of Business models; for this reason, there will be an initial focus on previous definitions with the aim of clarifying the principal characteristics and contents:

Business model Definitions		
Slywotsky	<i>“The totality of how a company selects its customers, defines and differentiates its offerings, defines the tasks it will perform itself and those it will outsource, configures its resources, goes to market, creates utility for customers and captures profits”</i>	1996
Mayo & Brown	<i>“The design of key interdependent systems that create and sustain its profit stream over time”</i>	1999
Stewart & Zhao	<i>A statement of how a firm will make money and sustain its profit stream over time”</i>	2000
Morris et al.	<i>“A business model is a concise representation of how an interrelated set of decision variables in the areas of venture Strategy, architecture, and economics are addressed to create sustainable competitive advantage in defined markets.”</i>	2005

Shafer et al.	<i>“A representation of a firm’s underlying core logic and strategic choices for creating and capturing value within a value network”</i>	2005
Zott & Amit	<i>“The content, structure, and governance of activity systems designed so as to create value through the exploitation to business opportunity”</i>	2010
Osterwalder & Pigneur	<i>“The rationale of how an organization creates, delivers, and captures value”</i>	2010
Johnson et al.	<i>“It provides an overview of the relationships between the actors involved in a business collaboration and of the way they all aim to benefit from it. Financially or otherwise”</i>	2014

Tab.3.10: Business Model Definition
Source: Personal Elaboration

The table above underlines the numerous interpretations and specific components each definition gives. Among the available explanations, strategic elements are most prominent. In fact, they emphasize the overall direction in the firm’s market positioning, interactions across organizational boundaries, and growth opportunities at the strategic level.

Empathizing this concept, Morris (Morris et al., 2005) group together the previous definitions given by Slywotsky, Mayo and Stewart capturing the essence of how the business system will be focused.

Academician Shafer (Shafer et al., 2005), in *“The power of business models”*, tries his self to clarify the concept, studying 12 definition coming from established publications and analyzing them through an affinity diagram. The result of the analysis identified four major categories as components of a Business model:

- *Strategic choices*
- *Creating value*
- *Capturing value*
- *Value network*

Therefore, his definition group these categories, maintaining a core logic as comprehensive as possible and reflecting the choices made by firms (Shafer et al., 2005).

Haftor (Haftor & Kurti, 2014) gives a further contribution in the clarification of the concept, proposing a classification in two major streams:

1. *Static view*: focusing on what business are, what components they are made of and their taxonomies (Zott & Amit, 2010);
2. *Dynamic view*: focusing on the creation, evolution and innovation of business models (Osterwalder & Pigneur, 2010).

Moreover, business model current can be classified as unit of analysis:

1. Business model conceptualized as a property of a firm (Osterwalder & Pigneur, 2010);
2. Broader Network perspective, in which a business model is conceptualized as a system of interdependent activities by firms and their partners through a transaction mechanism (Zott & Amit, 2010).

The advent of Digital innovation bring Business models to shift from a traditional static view to a broader dynamic view, due to the introduction of new prospects of information Value creation and capture, enhancing a broader view of the model (Bharadwaj et al., 2013).

Researcher Haftor, in his paper (Haftor & Kurti, 2014), focuses on the adaptation process of firms, highlighting its imperative importance in order to exploit new value creation opportunities.

New trends in Digital markets, that requires a new set of assumptions due to their intangible nature, bring the academicians Rai and Tang to introduce a new definition of “Digital” Business model as: *“elucidating how an organization is linked to external stakeholders and how it engages in economic exchanges with them to create value for all exchange partners”* (Rai & Tang, 2013).

Although, only few studies focused on business model innovation, there is an overall agreement that is crucial for firms’ survival (Haftor & Kurti, 2014).

Other variables influencing Business model creation and transformation process are business environment, competitive pressures, new technologies emergence and customers’ needs (Sosna et al., 2010).

3.6.2 Business Model frameworks

Among the different, and generally confusing, attempts of developing a Business model framework, this paragraph will quickly run over two of the most effective ones:

- *Standard Business Model Framework* (Morris et al., 2005):

It is a reasonably simple, logical, measurable, comprehensive, and operationally meaningful model built by academician Morris and consisting of three increasingly specific levels of decision-making:

“Foundation level”	<i>Generic decisions regarding what the business is and is not and ensure such decisions are internally consistent. It concerns Value proposition, the customer, internal processes and competencies, and how the firm makes money</i>
“Proprietary level”	<i>Enable development of unique combinations among decision variables that result in marketplace advantage depending on the ability of the entrepreneur to apply unique approaches to the “foundation” components</i>
“Rules level”	<i>Delineates guiding principles governing execution of decisions made at previous levels setting basic operating rules to ensure the correct execution of ongoing strategic actions</i>

Tab.3.11: Decision Making Levels

Source: Morris, *The entrepreneur’s business model*, 2005, *Journal of Business Research*

Further, at each level, six basic decision areas are considered:

1. *How will the firm create value?*
2. *For whom will the firm create value?*
3. *What is the firm’s internal source of advantage?*
4. *How will the firm position itself in the marketplace?*
5. *How will the firm make money?*
6. *What are the entrepreneur’s time, scope, and size ambitions?*

- *Business Model Mapping* (Osterwalder, 2004):

It is a simple and innovative representation with the aim of clarifying the processes of an organization, focusing on a general decomposition of the Business model into 9 points:

1. *Key activities;*
2. *Key resources;*
3. *Cost structure;*
4. *Client relationships;*
5. *Distribution channels;*
6. *Revenue flows;*
7. *Partner network;*
8. *Value proposition;*
9. *Client segments.*

Linked each others following the scheme below:

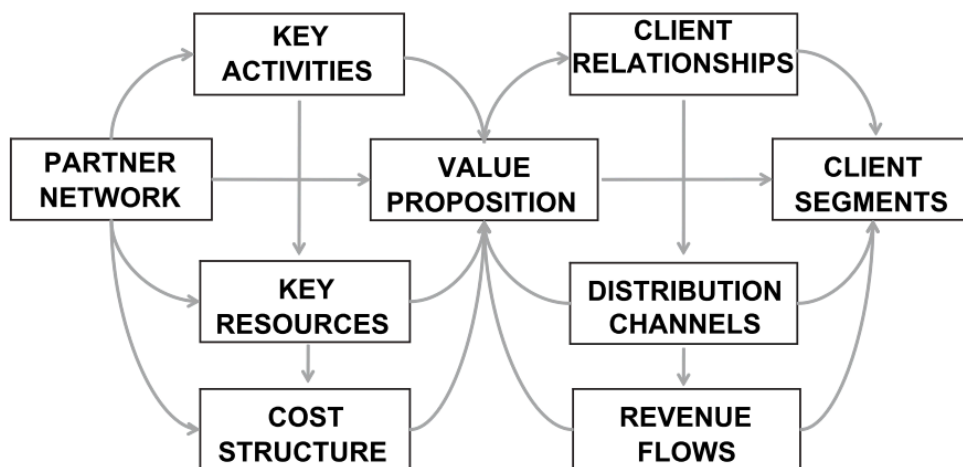


Fig.3.17: Business Model Decomposition

Source: Chesbrough, *Business model innovation: Opportunities and Barriers*, 2010, Long Range Planning

Osterwalder, in his model, aims at giving a structured view of the company based on a primary flow including partner Network, Value proposition and Client segments; and two secondary streams based on costs and revenues (Chesbrough, 2010).

The overall perspective of the concept of Business model, the clear path to Value generation and its adaptation to the innovative vision of Network make it a useful and natural extension of the concept of Strategic Networks.

3.6.3 Business Model – Strategy: relationship

Many researches highlight the strict link between Business Models and Strategy.

Chesbrough, in his studies related to business model innovation, argues that they directly aim at formulating the competitive strategy by which the innovating firm will gain and hold advantage among rivals (Chesbrough, 2010).

The definition itself, given by Shafer (Shafer et al., 2005), contains the concept of strategic choices; even if it doesn't define the precisely the strategy, a business model reflects firms strategic choices and their operating implications.

Similarly, Morris (Morris et al., 2005) affirms that it has elements of both strategy and operational effectiveness, encouraging the entrepreneur to:

- Conceptualize the venture as an interrelated set of strategic choices;
- Seek complementary relationships among elements through unique arrangements;
- Develop activities around a logical framework;
- Ensure consistency between elements of strategy, economics and growth.

This approach illustrates a comprehensive idea of Strategy among organizations focusing on performances and Value generation, in response to a generic lack in previous business strategy literature. Moreover, the positioning of firms within the larger Value Network can be a critical factor in Value creation, and companies must establish appropriate relationships with suppliers, partners, and customers. In fact, business models, supporting Value creation and Value capture, must occur within a Value Network and may help firms in creating unique relationships with any of the actors within it (Haftor & Kurti, 2014). As a consequence, Haftor asserts that the role an organization chooses to play within the Network is a crucial element of its Business model.

In addition, Johnson (Johnson et al., 2014) proposes a formal model based on the Network perspective of businesses, built on collaboration and value exchanges among actors; aligning considerably the concept of Business Model with the innovative Value Network stream.

The extant literature analysis proposed in this chapter acts as an introductory bridge to the second part of this thesis work: the empirical study.

In the next phase, the research will exploit the state of the art concerning the two principal literature streams: Strategic Networks and Value Networks, with the aim of building a new evaluation model named: Strategic Value Network.

CHAPTER 4 - EMPIRICAL ANALYSIS

4.1 STRATEGIC VALUE NETWORK

With the aim of analyzing empirically networks based on Entrepreneurship, in this second phase of the research, the objective is to build a comprehensive model able to be extremely flexible, in order to give a proper evaluation of every entrepreneurial network based on innovation and digital markets.

The model is generated from the literature analysis previously illustrated, combining the most critical characteristics of the two main streams examined: Strategic Networks and Value Networks.

In this chapter, we will briefly schematize the two streams, highlighting the main features and illustrating graphically their application. Then, we will select the most suitable characteristics, grouping the theories in a brand new model called, for simplicity, Strategic Value Network.

4.1.1 Strategic Network main features

The Strategic Network theory is based on the evaluation of the relationships among firms, focusing on the behaviors and the strategic positioning held by actors among the network in order to take advantage from the access to information, resources, markets and technologies. Going deeper in the analysis of the structural characteristics of the network, the most critical features are:

Static analysis

- Network Tie: relationship links among actors, classified by:
 1. Type:
 - a. Direct
 - b. Indirect
 2. Degree of Strength
 3. Degree of Formalization

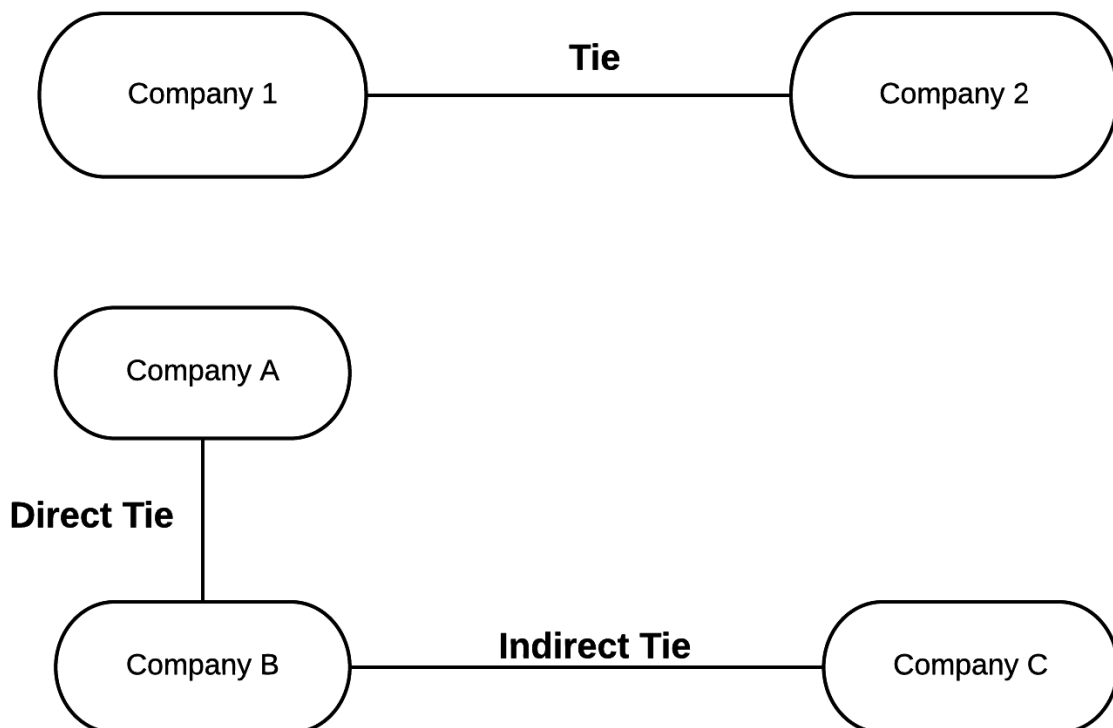


Fig.4.1: Network Ties
Source: Personal Elaboration

As shown in Fig. 22, Company 1 and Company 2 are related by a Network Tie, this tie can be any share of information or products for strategic purpose. The second part of the figure illustrates the two kind of linkages respect to Company A; A is related to B directly, and to C thanks to the relationship between Company B and Company C.

A direct tie brings several benefits such as, knowledge sharing, skills complementarity and scale economies in research; while indirect ties advantages are strictly related to the number of direct linkages held by the analyzed company. The greater the number of direct ties, the smaller the benefits from indirect ties. The degree of formalization of a tie introduces a dark side coming from a link: the higher the formalization of a tie, the higher the probability of collusion among firms, because of higher relationship cost derived from formal contracts lock-in participants generating inefficiencies.

- Network Focal: it is the firm that links all the other “peripheral” companies; it is the center of the Network.

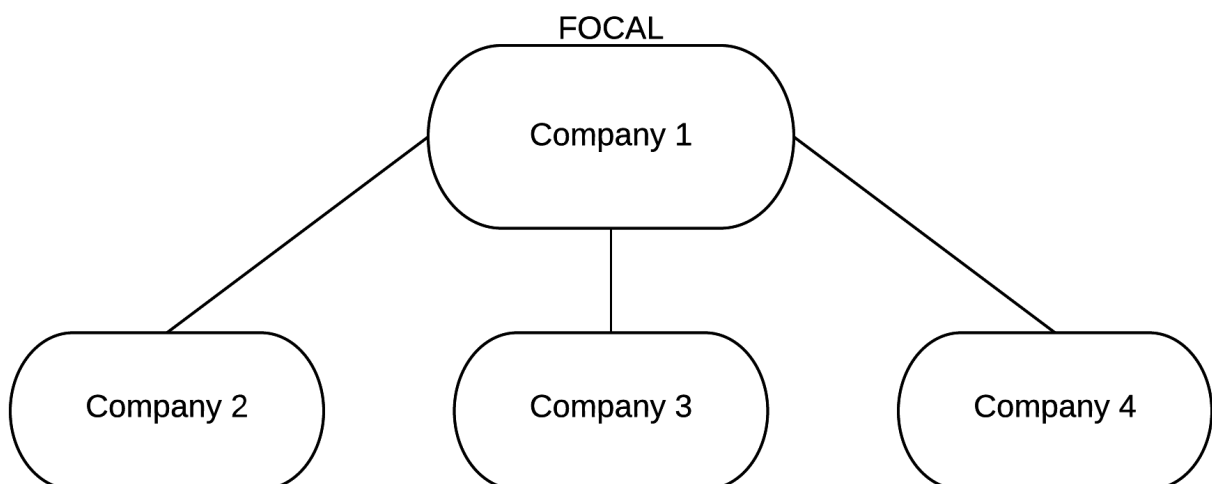


Fig.4.2: Network Focal
Source: Personal Elaboration

Company 1 is linked with all the other companies (2, 3, 4) controlling the original source of value. The focal company hold a preferential position since it can exploit the relationship with every player in the network. However, this decentered

configuration avoids a full optimization of the whole ecosystem, enhancing the development of “structural holes”.

- Structural Holes: it is the connection of two firms only through a third company, usually the network focal.

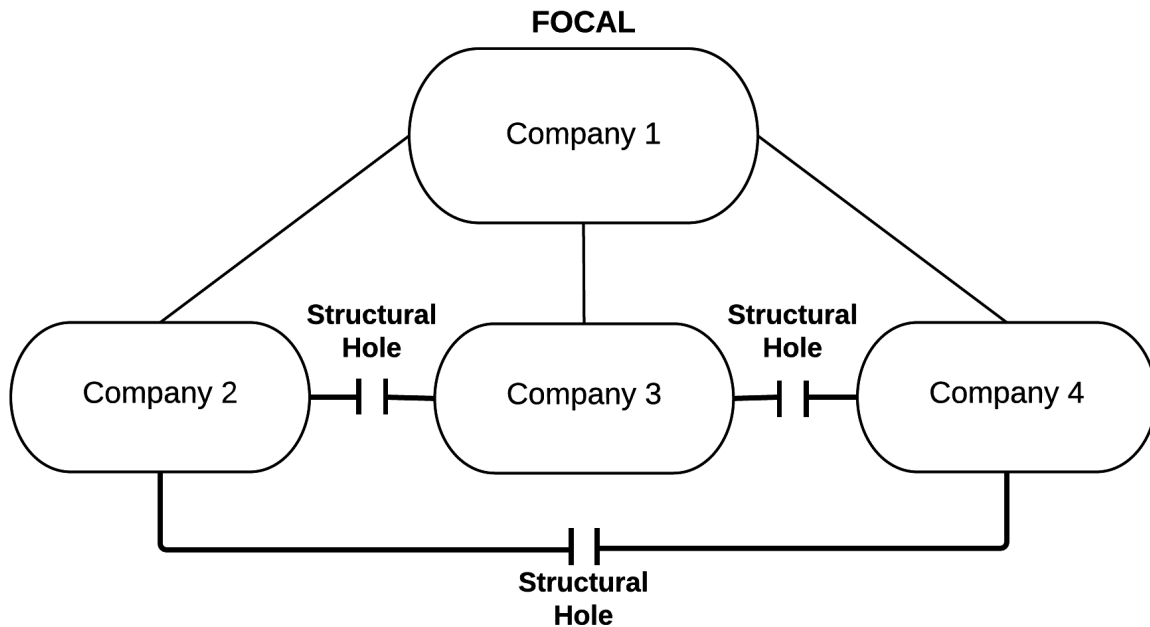


Fig.4.3: Structural Holes
Source: Personal Elaboration

Figure 24 illustrate a simple case of structural hole generation; company 2, company 3 and company 4 are, respectively, connected only indirectly through company 1, that in this case is also the network focal.

The lack of a direct tie brings 2, 3 and 4 to rely on company 1 for any exchange among them bringing an inefficiency in the network.

- Structural Equivalences: it is the situation in which two or more companies hold a similar position within the network. It means conducting the same activities, producing the same goods or delivering the same service compared to other players among the network.

Structural equivalences result in an increase in competition and a duplication of resources, bringing the two actors redundant and providing a consequent lost in network efficiency.

Dynamic analysis

- Lock-in / Lock-out effects: restriction in future allies' formation, generated when forming ties with one actor place constraints on ties with others. This phenomenon is strictly related to the degree of formalization of the tie and to the dimension of the portfolio of relationships. The principal constraints are related to resource/time and to fidelity/loyalty expectations. Restrictions on allies' choices could turn into counter-productive network behaviors.
- Learning Races: competitive behaviors that bring companies to conduct in an opportunistic way. Usually, these self-serving behaviors are shown in a competition among firms, in order to internalize the partner's assets and resources. Learning races could be extremely detrimental for the ecosystem and for the players living it.
- Trust: it is a core aspect of the Network and drives all the relationship linkages and behaviors of an ecosystem. Even if trust is an abstract theoretical approach, it is fundamental in every social exchange and brings several benefits summarized in the table below:

Benefits
<i>Tie cost reduction</i>
<i>Time saving</i>
<i>Enhancing of lean relationships</i>
<i>Reduction of opportunism</i>
<i>Better Outputs nurturing</i>

Tab.4.1: Trustful environment Benefits
Source: Personal Elaboration

The development of trustful environments brings to establish “informal” relationships among firms characterized by low transaction costs and little time requirements, that bring to flexible and lean way of sharing information and exchanging goods and services; essential feature for a healthy entrepreneurial ecosystem. The nurturing of trust generates the creation of some “unwritten” rules that allow common self-evaluation of relationship partners causing restrictions related to lock-in and lock-out effects in the ecosystem.

4.1.2 Value Network main features

The Value Network theory focuses on the exchanges among firms and, especially, on the value generated by a web of relationships. Digital entrepreneurial ecosystems are complex and dynamic networks that must be analyzed holistically, through an up to date tool, giving importance to tangible exchanges as well as intangible ones. As a consequence, the Value Network approach proposes the following critical features with the aim of giving a throughout evaluation of the network:

- Value Exchange Mapping: it is the first step for understanding the relationship among firms and developing a value network strategy. The map illustrates the linkages between company at an atomistic level, and it relies on three simple elements:
 - *Roles*: participants of the network, providing contributions and carrying out functions among it. It is represented in the map by an oval.
 - *Transactions/Activities*: represented by an arrow, they denote the direction of what passes among two roles and can be divided in:
 - *Tangible exchanges*: goods, services and revenues
 - *Intangible exchanges*: information, ideas or knowledge;
 - *Deliverables*: they are the actual things moving from one participant to another.

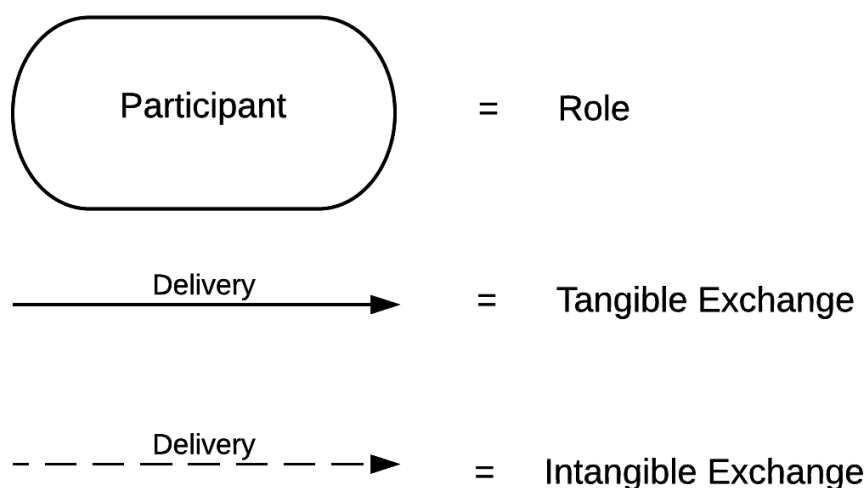


Fig.4.4: Value mapping elements
 Source: Personal Elaboration

- Exchange Analysis: it is the assessment of the value dynamics, health and vitality, and value conversion capability of the ecosystem as a whole. It is crucial for testing the sustainability of the Network and its expansion possibility. The basic analysis questions are:
 - *Is there a coherent logic and flow to the way value moves through the system?*
 - *Does the system have healthy exchanges of both tangibles and intangibles?*
 - *Is there an overall pattern of reciprocity?*
 - *Are there missing of “dead” links, weak and ineffective links, or participant bottlenecks?*
 - *Is the whole system being optimized, or are some participant benefiting at the expense of others?*
 - *What is the overall pattern of exchanges and value creation in the system as a whole?*

- Impact Analysis: it is the analysis of the impact that an ecosystem has on a determined player made through an evaluation of all the *inputs* received. This focused analysis aims at assessing whether a role is realizing value from the input he receives. It answers to the following questions:
 - *What are the tangible and intangible costs/risks and gains coming from a determined input?*
 - *How is a particular input helping to build capability by increasing the competence of people, improving processes, or building better business and community relationships?*
 - *How an input is helping increase the financial picture of the company?*
 - *What impact does each value input have on the roles involved in terms of value realization?*

To display data, it is possible to use the table illustrated below:

Input	From	Activities generated	Tangibles Impact	Intangibles Impact			Cost/Risk	Benefits
				Customer Capital	Human Competence	Internal Structures		

Cost/Risk & Benefits: HIGH = H MEDIUM = M LOW = L

*Tab.4.2: Impact analysis table
Source: Personal elaboration*

- Value creation Analysis: it is the evaluation of how each role adds value to the network. Contrarily respect to impact analysis, the value creation analysis focuses on the value creation and *output* of each role. The basic analysis questions are:
 - *What are the core value-creating activities for this role?*
 - *What specific value outputs does it generate and provide to other roles and participants?*
 - *Are the outputs providing value for the system as a whole?*
 - *Are some variables or resource constraints affecting a participant's ability to create value?*

Similarly, with the Impact analysis it is possible to group all the information gathered into an analytic table:

Output	Goes To	Value Enhancements or Value Added	Cost/Risk	Benefit

Cost/Risk & Benefits: HIGH = H MEDIUM = M LOW = L

Tab.4.3: Impact analysis table
Source: Personal elaboration

4.1.3 An Innovative approach: The Strategic Value Network model

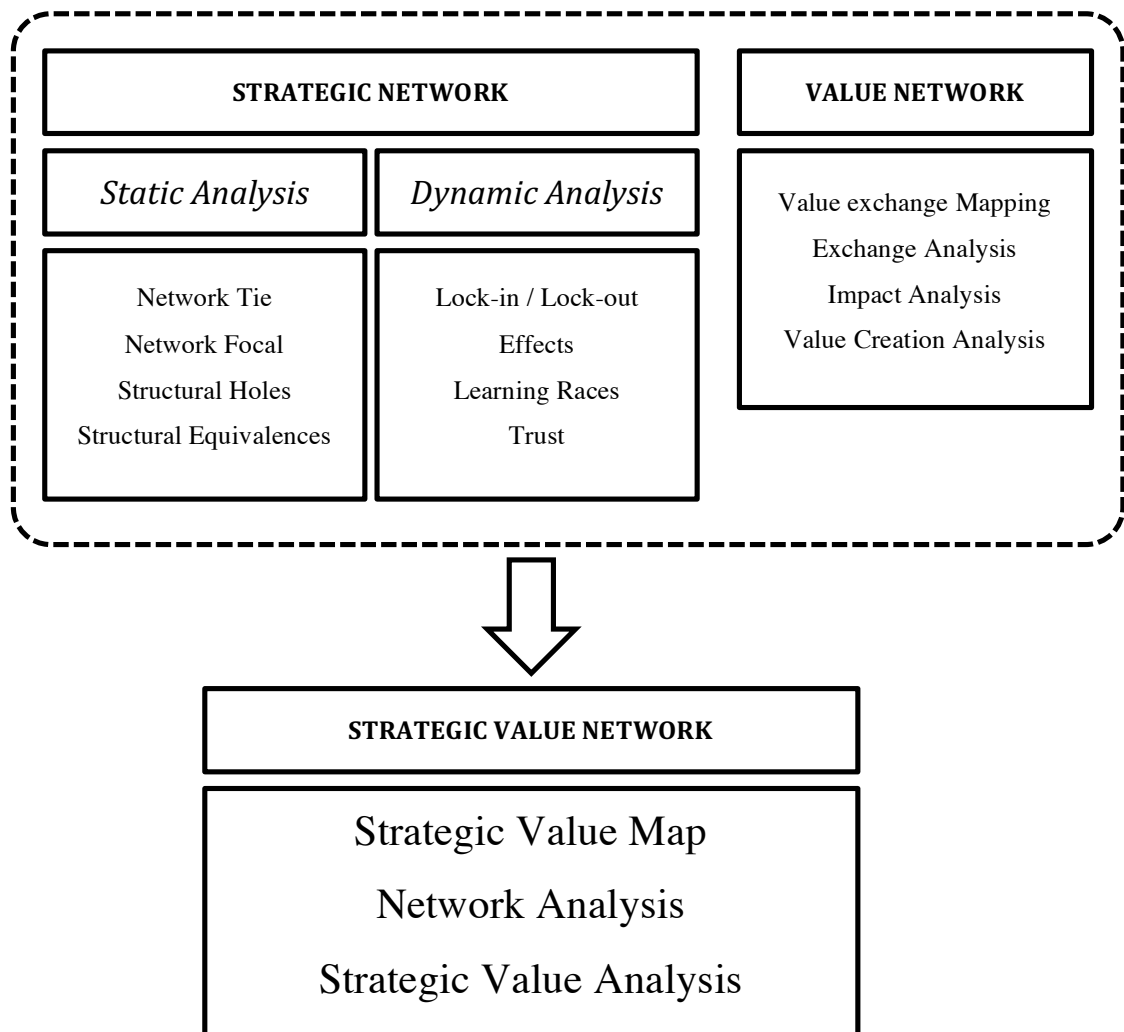


Fig.4.5: The Strategic Value Network formation
Source: Personal Elaboration

The figure above highlights the combination of Strategic Network and Value Network theories in order to generate the new model called “*Strategic Value Network*”.

In this paragraph, the research aims at illustrating the principal characteristics of the model, whose purpose is to evaluate performances of an entire entrepreneurial ecosystem at a strategic level, highlighting the impact of the network on determined participants and the value generated by each one of them.

The Strategic Value model is structured into 3 different phases of analysis:

Strategic Value Map

The first step to understand how an ecosystem is structured, which are the participants of the network, how they are tied and which exchanges are placed among them, is to represent it graphically through different maps.

It is fundamental to depict both the typical strategic ties that represent the relationship links among players of a network, both the specific tangible and intangible exchanges between them, in order to evaluate in a more detailed way the pattern of an ecosystem. The empirical model developed comprehends, thus, two maps:

1. *Exchange Map*: it depicts the exchange patterns of an ecosystem, allowing to understand at an atomistic level the transactions happening in the network and making easier the comprehension of the dynamics of the ecosystem even at a managerial level.

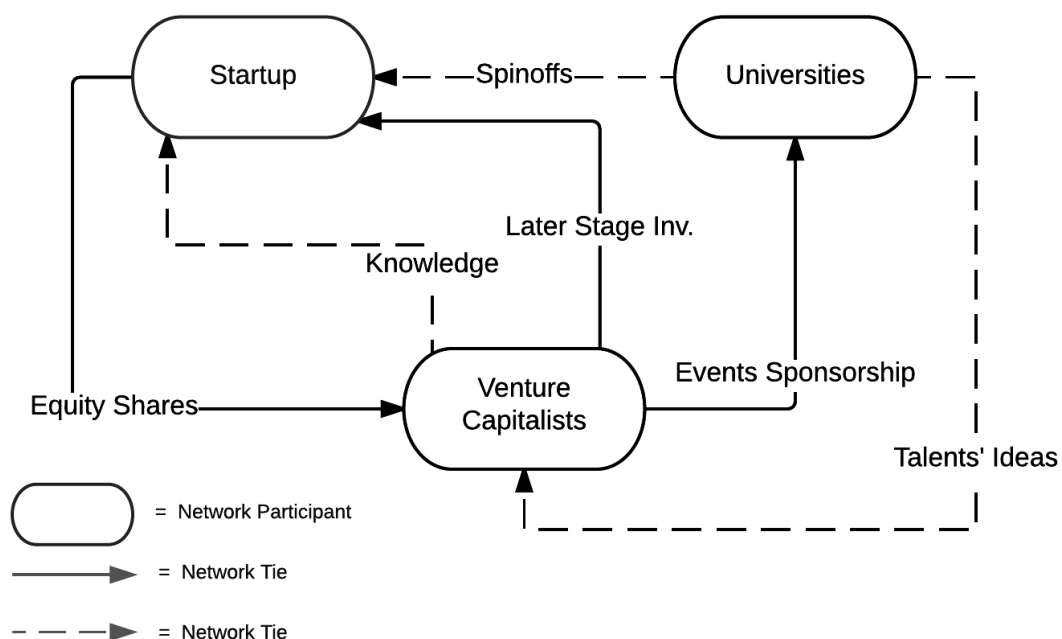


Fig.4.6: Exchange Map - example
 Source: Personal Elaboration

The useful insights given by the above example map are related to the recognition of both tangible and intangible exchanges with the same importance, giving a throughout vision of the Ecosystem.

- *Tangible exchanges*: exchange of services or goods, incorporating all transactions involving contracts and invoices, return receipt of orders, request for proposals, confirmations, or payment. Knowledge products that generate revenue or are expected as part of service are part of the flow of goods, services, and revenues.
- *Intangible exchanges*:
 - Exchanges of strategic information, planning knowledge, process knowledge, technical know-how, collaborative design and policy development, which flow around and support the core product and service value chain.
 - Exchanges of value and benefits that go beyond the actual service and that are not accounted for in traditional financial measures, such as a sense of community, customer loyalty, image enhancement, or co-branding opportunities.
 - Influence and power, for example rules imposed by regulators.

When illustrating ample and complex ecosystems it is suggested to split the exchange map into two different maps: *tangible map* and *intangible map*; in order to maintain the analysis lean and understandable.

2. *Ties Map*: it represents graphically the linkages among the participants of the network, giving a first view of the relationships between firms.

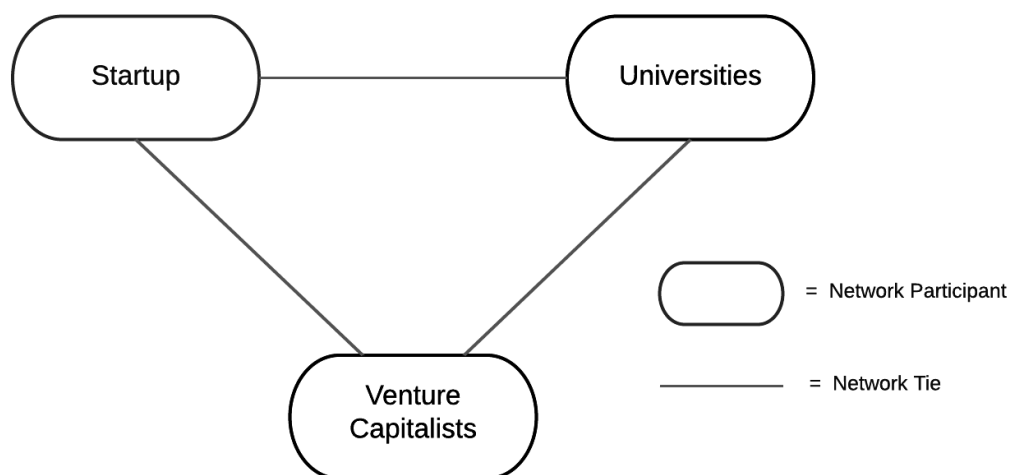


Fig.4.7: Ties Map - example
 Source: Personal Elaboration

The representation of ties gives clues on the structure of the network, illustrating the relationship behaviors and business networks among firms.

Network Analysis

After an initial assessment of the ecosystem as a whole; the model proposed, focuses on a deep analysis of the principal strategic concepts, evaluating the nature of the ties among participants. The Network analysis is a critical phase in which the model allows to assess in a more detailed way, the structure of the ecosystem and the position each player is holding among it. The analysis contains especially Strategic network theories since, being concentrated on how companies are positioned within the ecosystem, some concepts like Structural holes and Structural equivalences are considered essential for depicting the network structure. On the other hand, the addition of value network theories such as tangible and intangible exchanges gives extra insights on the underlying pattern of the ecosystem.

This analysis phase is handled following the path illustrated below:

1. For each network participant:
 - a. *# of Direct/Indirect ties*: it is the assessment of the social behaviors of each player; fundamental for the evaluation of the density of the network.
 - b. *# of Tangible/Intangible exchanges*: it is related to the nature of the analyzed ecosystem, and represents the ratio among tangible and intangible trade patterns.

Participant	Direct Ties	Indirect Ties	Tangible Exchanges	Intangible Exchanges

Tab.4.4: Ties & Exchanges Table
Source: Personal Elaboration

2. *Structural Holes map*: it depicts the interruptions among firms' linkages, due to situations in which two or more companies within a network are connected only through third companies usually identified as network focal. The model, build on the literature analysis held in the previous chapter, embraces Coleman's theory, considering structural holes highly detrimental for the development of a healthy ecosystem since they obstruct the flow of information. Given that, the more structural holes present in the map, the less efficient the ecosystem will be.

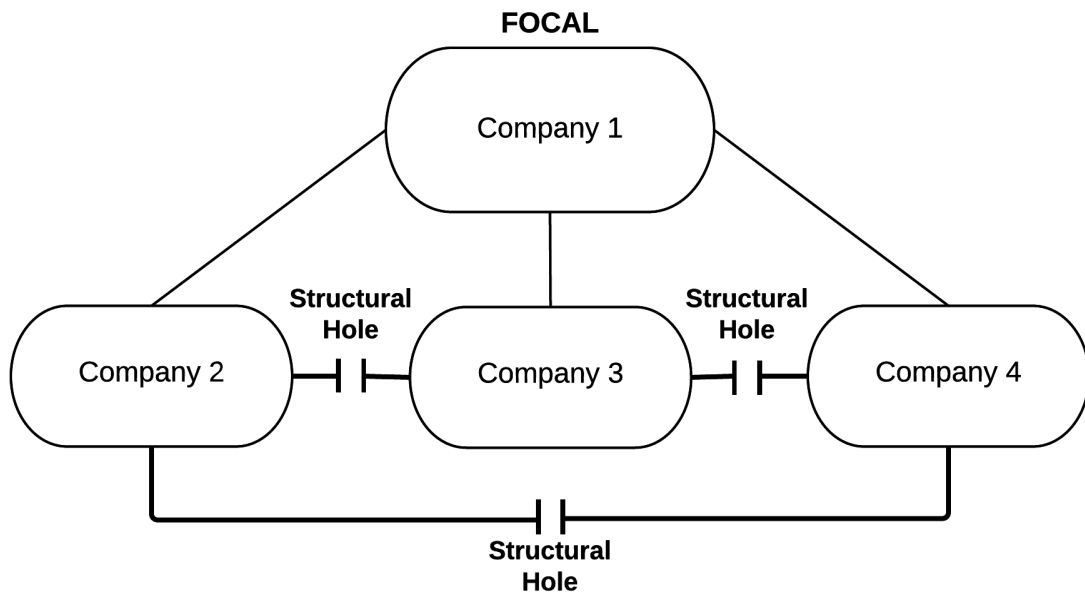


Fig.4.8: Structural holes map – example

Source: Personal Elaboration

3. *Structural equivalences map*: it represents all the companies holding a similar position within the network. Structural equivalence means conducting the same activities or having the same network of other participants. Equivalences can be found both among similar players, both among companies belonging to the same category. Literature researches on this phenomenon says that it brings to an increase in competition among redundant actors, undermining the health of an ecosystem.

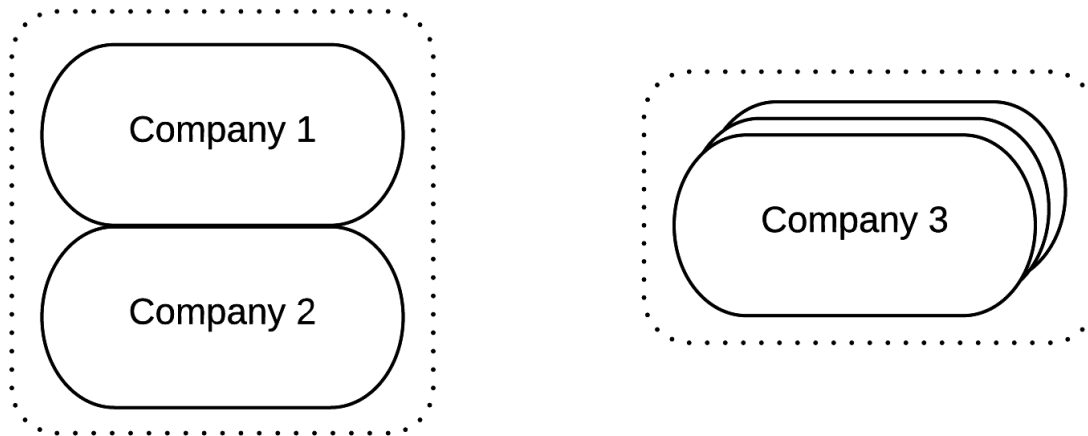


Fig.4.9: Structural Equivalences – notation example
Source: Personal Elaboration

The figure above represents the notation used in the model to highlight similar behaviors and simplify networks with equivalences among alike participants (Company1-Company2) and among the same player's group (Company3).

4. *Outcomes analysis*: it is the elaboration of previous maps and tables in order to clearly define the underlying structure and behaviors of the network. The two main outcomes of the analysis are:
 - a. *Open system vs Closed system*: it is the analysis of density, interconnection and diversity of the network; an open network is characterized by a high number of indirect ties compared to direct ones, and a resulting relevant number of structural holes. On contrary, a closed system is featured by dense networks in which almost every participant is linked with each other and constituted, for the most part, of direct linkages. An open system configuration is suitable for well established organizations in which the principal cost driver is transaction cost; while closed systems are highly beneficial in turbulent and information-based ecosystem like the entrepreneurial one. The definition of network pattern is fundamental to understand how the ecosystem exchange flow will move among players and, consequently, which will be the basic rules governing it.

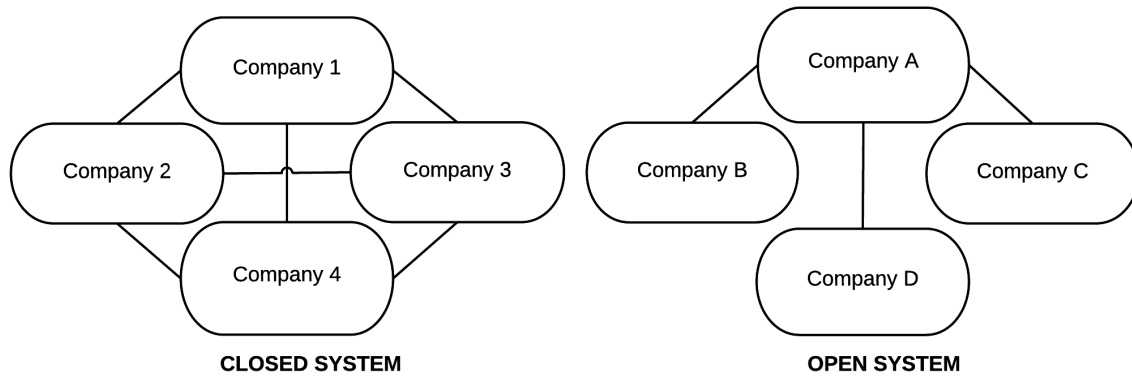


Fig.4.10: Closed system – Open system example

Source: Personal Elaboration

- b. *Network focal definition*: it is the assessment of the company standing in a central position within the network, that is the one linking almost all the other firms and holding the original source of value. The focal definition depends on the structure of relationship links, and it can have different configurations:
- i. *No focal*
 - ii. *One focal*
 - iii. *More than one focal*

Strategic Value Analysis

Once evaluated the network at a system level, the model purposes an analysis at a company-level, with the aim of assessing the impact of inputs received from the surrounding ecosystem as a value generated, and the costs of the value added as an output by each analyzed company. The outcome will be a detailed illustration of the flows exchanged within the network by selected participants focusing on the Value Capture ability both on company-level, both on a broader ecosystem view.

Each company will be analyzed using both strategic and value network techniques, illustrating the value exchanged among players, in order to offer the most comprehensive evaluation maintaining a strategic approach.

The analysis follows the scheme below:

1. *Input/Output Map*: each participant's inputs and outputs are displayed separately in order to enhance a isolated analysis.
2. *Input Analysis*: it is the evaluation of the nature of the input and the impact that, each of the collaborative players within the ecosystem, has on the analyzed company's business activities and performances. The analysis aims at assessing the total value achieved by being part of the ecosystem through the calculation of the sum of each input value. The impact is a numerical level evaluated through a 5-points Likert Scale weighted on consensus, in which 1 is equal to very low and 5 to very high.

Input	From	Definition	Tang. / Intang.	Impact

Impact: 1=Very Low 2=Low 3=medium 4=High 5=Very High

Tab.4.5: Input Analysis
Source: Personal Elaboration

3. *Output Analysis*: it is the assessment of the resource spent by the analyzed company for the generation of value beneficial for the surrounding ecosystem, focusing on both tangible and intangible resources necessary for the outputs exchange. The sum of all the output values of each company returns the total Value added costs bear in the participation to the network activity. The value added cost level is a numerical level evaluated through a 5-points Likert Scale weighted on consensus, in which 1 is equal to very low and 5 to very high.

Output	To	Definition	Tang. / Intang.	Value Added Cost

Value Added: 1=Very Low 2=Low 3=medium 4=High 5=Very High

Tab.4.6: *Output Analysis*
Source: *Personal Elaboration*

4. *Value Capture Analysis*:

a. *Participant-level*: it is the marginal value obtained as the difference between the total Value Generated as input, and the total cost for adding value as output; and it represents the ability of capturing value from the ecosystem of an analyzed participant group: key characteristic of a performance assessment.

$$\sum_{i=1}^n input(i_k) - \sum_{j=1}^m output(j_k) = Value Capture_k$$

i_k = input i of participant k

j_k = output j of participant k

n = tot # of inputs of a participant k

m = tot # of outputs of a participant k

k = each participant

(if: $\sum input(i_k) > \sum output(j_k) \rightarrow Ecosystem\ benefits$)

In the above formula shows the value outflows and inflows that the research aims to assess coherently with the value strategic network approach proposed by this thesis work.

- b. *Ecosystem-level*: it is the marginal value obtained as the difference between the Impact value and the value added cost of each exchange made among the network. It represents the network Value Capture, giving several clues on the strategic performance of the entire Ecosystem.

$$\sum_i^n (\text{impact} - \text{cost})_i = \text{Ecosystem Value Capture}$$

$i = \text{exchange } i$

$n = \text{tot \# of exchanges}$

The criteria adopted for the selection of previous theories' characteristics was entirely focused on their application to the entrepreneurship features and their coexistence. For those reasons, the entire static features of strategic networks theory were maintained, while the dynamic part is represented only by the concept of trust that, although it is not explicitly present in the model, it strongly affects each tie and drives entrepreneurship's behaviors. Therefore, trust indirectly influences both lock-in & lock-out effects, both learning races.

On the other hand, Value network theories were reinterpreted adding a more solid content base to their methodology and modifying the structure of the analysis to properly evaluate the innovative and disruptive environment of Entrepreneurship.

4.2 STRATEGIC VALUE NETWORK – SAN FRANCISCO BAY AREA

After having illustrated exhaustively the characteristics of the evaluation model developed as output of the literature research and experience made; this paragraph aims to implement the empirical knowledge and procedures learnt to a real entrepreneurial ecosystem context.

4.2.1 An overview of San Francisco bay ecosystem

“Silicon Valley” is the nickname of the southern portion of the San Francisco Bay area, and it has earned the reputation of global tech “mecca” from expert all around the world. Its worldwide reputation is due to the several successful companies born in the last decades in that area, such as Apple, Google, Facebook, and countless others. Even though other ecosystems have exploded globally, Silicon Valley still has about as much capital and exit volume as the rest of the top 20 ecosystems combined [47.30% of total exit volumes in USD] (Startup Compass Inc., 2015).

	Ranking		Performance	Funding	Market Reach	Talent	Startup Exp.	Growth Index
Silicon Valley	1	◀	1	1	4	1	1	2.1
New York City	2	▲ 3	2	2	1	9	4	1.8
Los Angeles	3	◀	4	4	2	10	5	1.8
Boston	4	▲ 2	3	3	7	12	7	2.7
Tel Aviv	5	▼ 3	6	5	13	3	6	2.9
London	6	▲ 1	5	10	3	7	13	3.3
Chicago	7	▲ 3	8	12	5	11	14	2.8
Seattle	8	▼ 4	12	11	12	4	3	2.1
Berlin	9	▲ 6	7	8	19	8	8	10
Singapore	10	▲ 7	11	9	9	20	9	1.9
Paris	11	◀	13	13	6	16	15	1.3
Sao Paulo	12	▲ 1	9	7	11	19	19	3.5
Moscow	13	▲ 1	17	15	8	2	20	1.0
Austin	14	NEW	16	14	18	5	2	1.9
Bangalore	15	▲ 4	10	6	20	17	12	4.9
Sydney	16	▼ 4	20	16	17	6	10	1.1
Toronto	17	▼ 9	14	18	14	15	18	1.3
Vancouver	18	▼ 9	18	19	15	14	11	1.2
Amsterdam	19	NEW	15	20	10	18	16	3.0
Montreal	20	NEW	19	17	16	13	17	1.5

Fig.4.11: The Startup Ecosystem Ranking

Source: The Global Startup Ecosystem Ranking 2015, Startup Genome, Compass

The above-mentioned area has become the inspiration and “best practice” for other entrepreneurial communities and an attraction center for founders and high tech talents, bringing more than 50% of startups to be founded by immigrants.

Some of the key characteristics of the Silicon Valley ecosystem listed below:

Key characteristics of Silicon Valley Ecosystem

- Dual ecosystem of large firms and Startups
 - High financial returns for successful entrepreneurs and startups’ early employees
 - Global top-level human resources for all stages of startups
 - Business Infrastructure (law firms, accounting firms, mentors, etc.)
 - Venture Capital most competitive market
 - Globally top class Universities (Stanford, UC Berkeley, UCSF)
 - Human resource clusters anchored around top universities
 - Balance of “open Innovation” and intellectual property protection
 - “Technology Pump” of top human resources from all over the world
 - Culture of accepting failures (effective evaluation and monitoring)
 - Extensive government role in shaping technology and science
-

Tab.4.8: Key characteristics of Silicon Valley Ecosystem
Source: Personal Elaboration

An analysis of the volume of ecosystem’s actors, gathered from up to date sources, bring to significantly high outcomes:

- Startups: 7723 [crunchbase.com]
- Incubators & Accelerators: 227 [angel.co]
- Investing companies: 371 [angel.co]
- Co-working spaces: 46 [wiki.coworking.org]

All these outstanding results bring several practitioners to focus on the Silicon Valley ecosystem, studying its principal dynamics and trying to give hints for replicating such a prosperous entrepreneurial environment. However, the majority of the attempts failed miserably due to the complex and unique environment present in San Francisco area. Merely copy the “valley” is impossible and a highly misleading approach since the favorable conditions in which it nurtured are unrepeatable.

This research work aims at giving a structured illustration of the ecosystem using a different and innovative approach based on the combinations of strategic and value theories. The output will be a detailed analysis, at an atomistic level, of all the linkages and exchanges occurring daily in such an extraordinary ecosystem.

The analysis will follow step by step the model illustrated in the previous paragraph, starting with a visual overview of the network and going on with structural and more detailed evaluations:

- 1) Strategic Value map
- 2) Network analysis
- 3) Strategic Value analysis

4.2.2 Silicon Valley Strategic Value Map

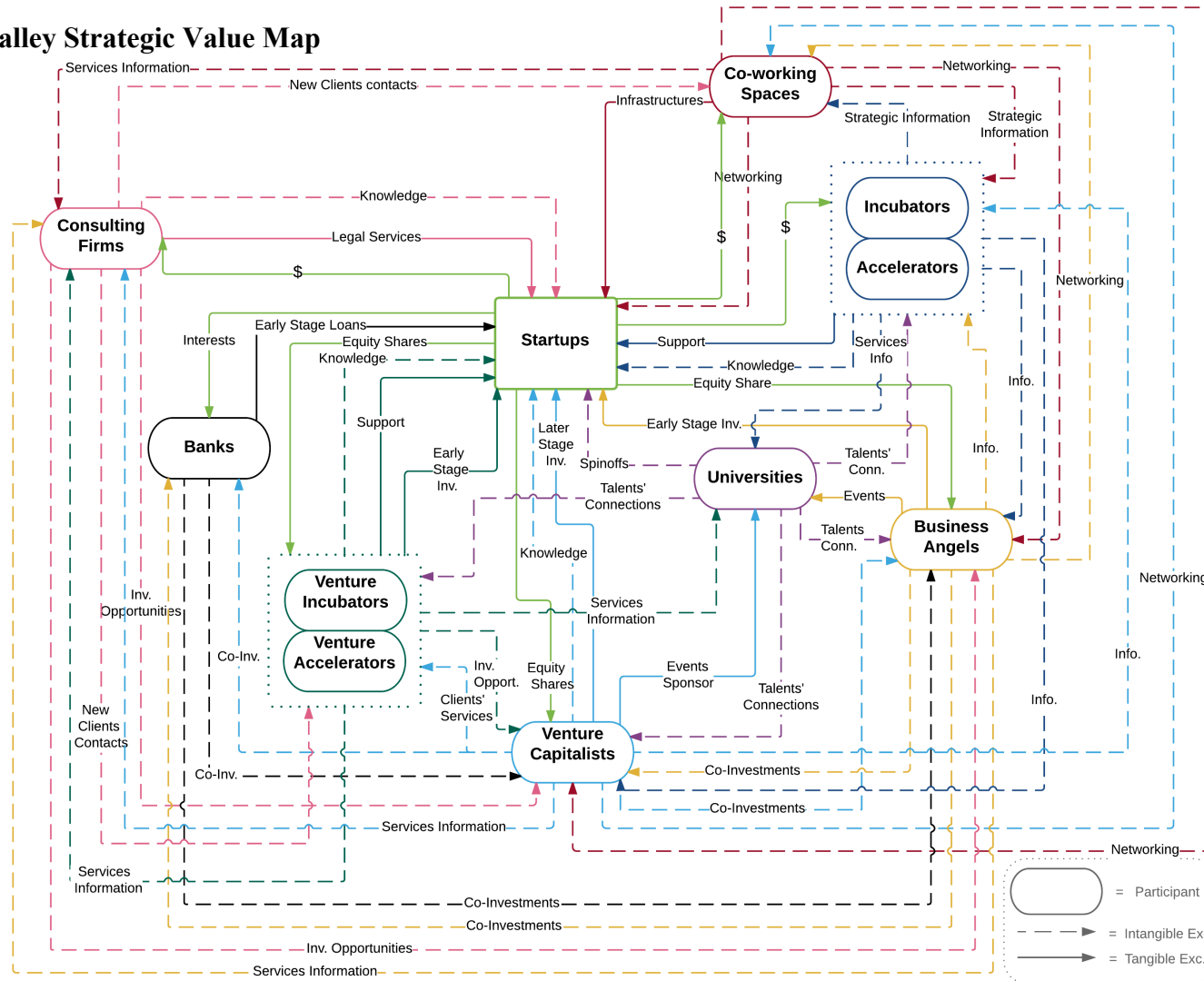


Fig.4.12: Exchange Map – San Francisco bay area
Source: Personal Elaboration

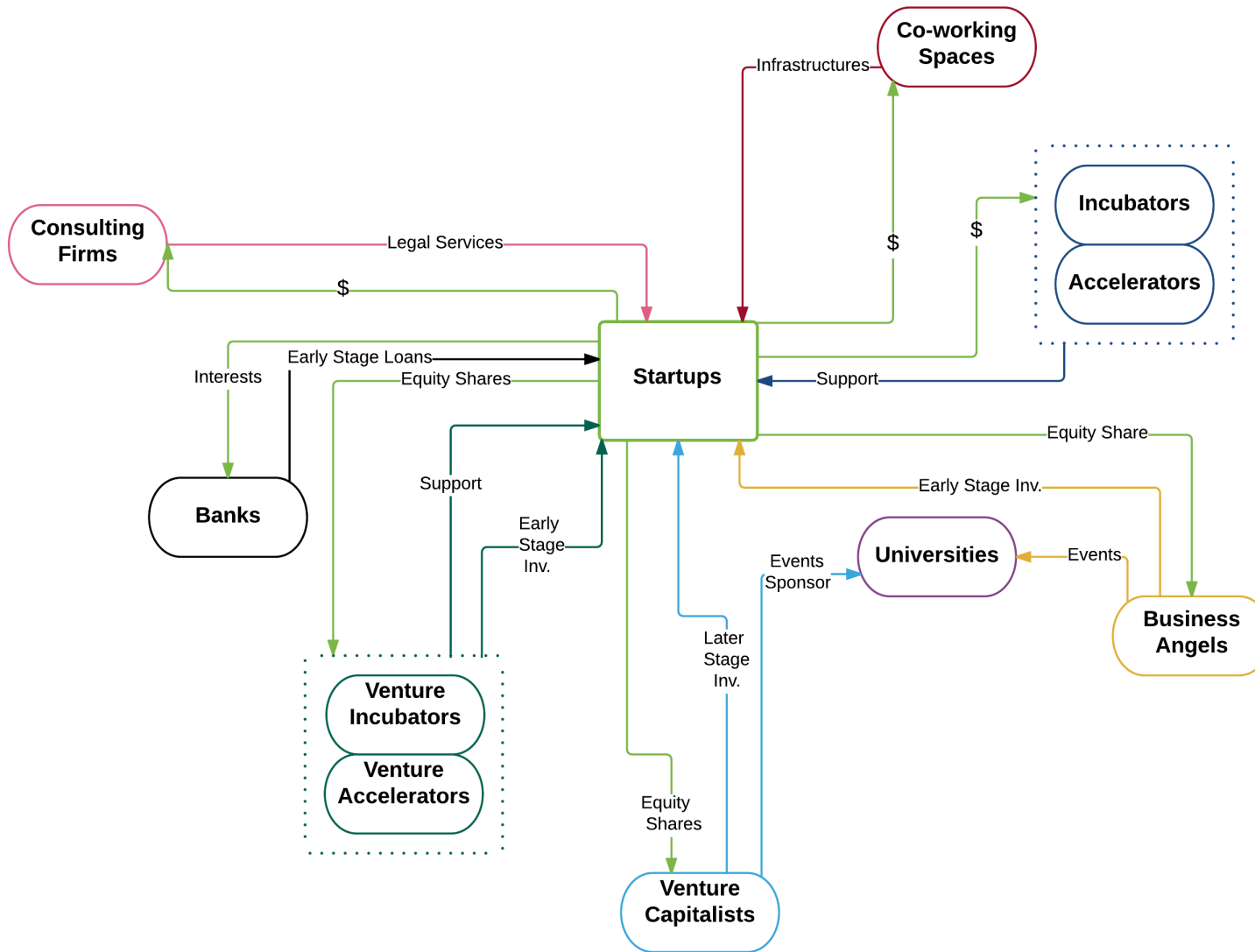


Fig.4.13: Tangible Map – San Francisco bay area
 Source: Personal Elaboration

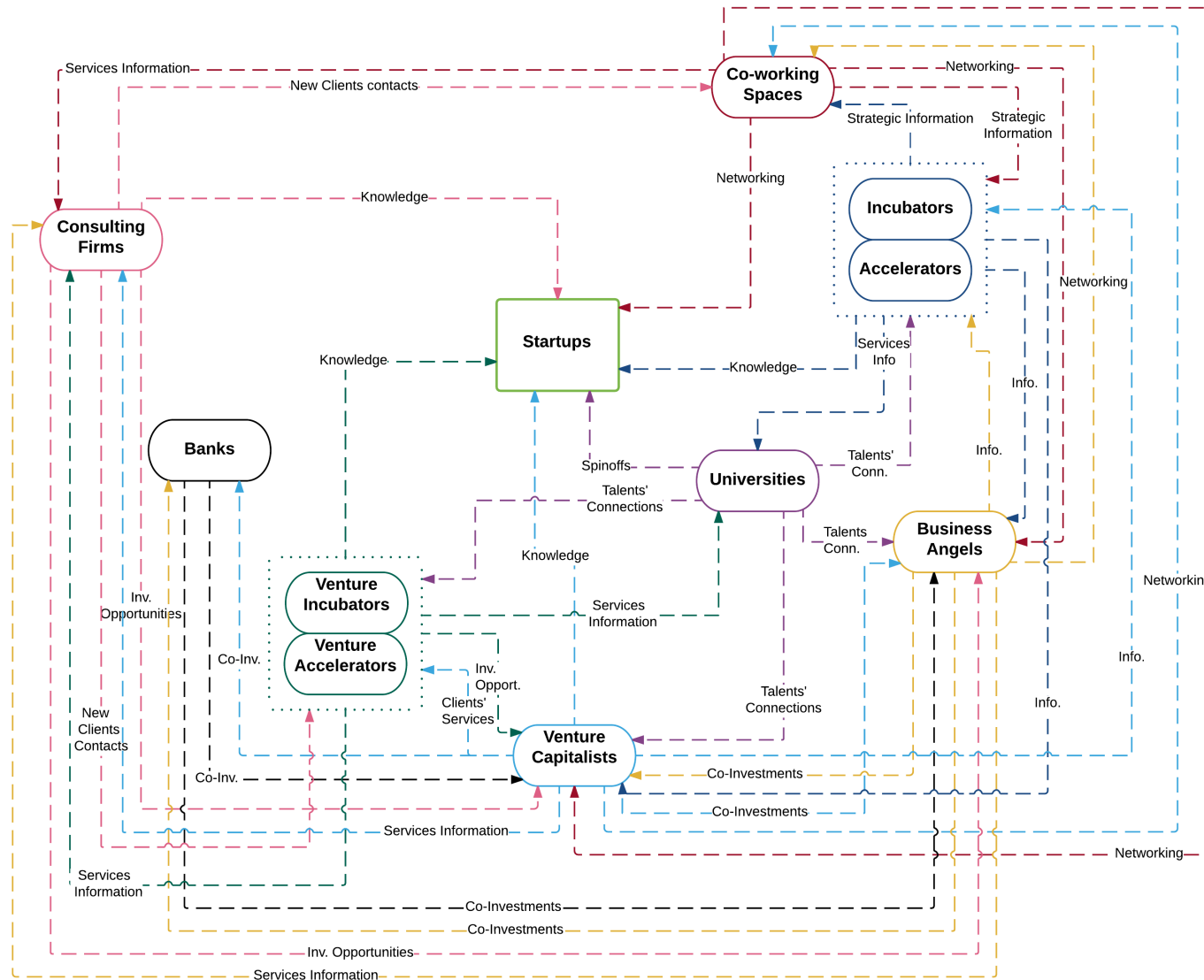


Fig.4.14: Intangible Map – San Francisco Bay area
Source: Personal Elaboration

Mapping the ecosystem is the first step for understanding the relationships among firms. A first view at the exchange map shows the complex and intertwined nature of the network simply depicting the numerous interactions among it. The critical feature of the maps illustrated above is the holistic consideration of both tangible and intangible exchanges giving a throughout vision of the dynamics of the ecosystem.

The most common error, made while evaluating a network, is to follow a traditional path and take into account only monetary transaction, arriving at an erroneous conclusion based on a Startup centric network as illustrated in the Tangible Map above. In fact, the entrepreneurial ecosystem is generated by a supporting cast of service oriented firms that helps entrepreneurs and their startups to thrive in a flexible and resource scarce environment. However, essential for the understanding of innovation driven ecosystem is the focus on the information, ideas and knowledge flow, whose importance grew exponentially during last decades.

A further analysis of the above maps, then, reveal the determined prevalence of intangible exchanges, typical of High-Tech contexts and Digital innovative markets that constitute almost the entire nature of the San Francisco Bay ecosystem. The complexity and the intangible predominance are themselves the most important and valuable features of the ecosystem analyzed; due to the fact that, thanks to a particular trustful environment, they create an inimitable value net that will be grasped in detail in the following phases of the model.

Any kind of asset exchanged among firms generates a tie that links them into a relationship and that is illustrated in the Tie Map below. Each linkage will be singularly evaluated at a later stage in the analysis.

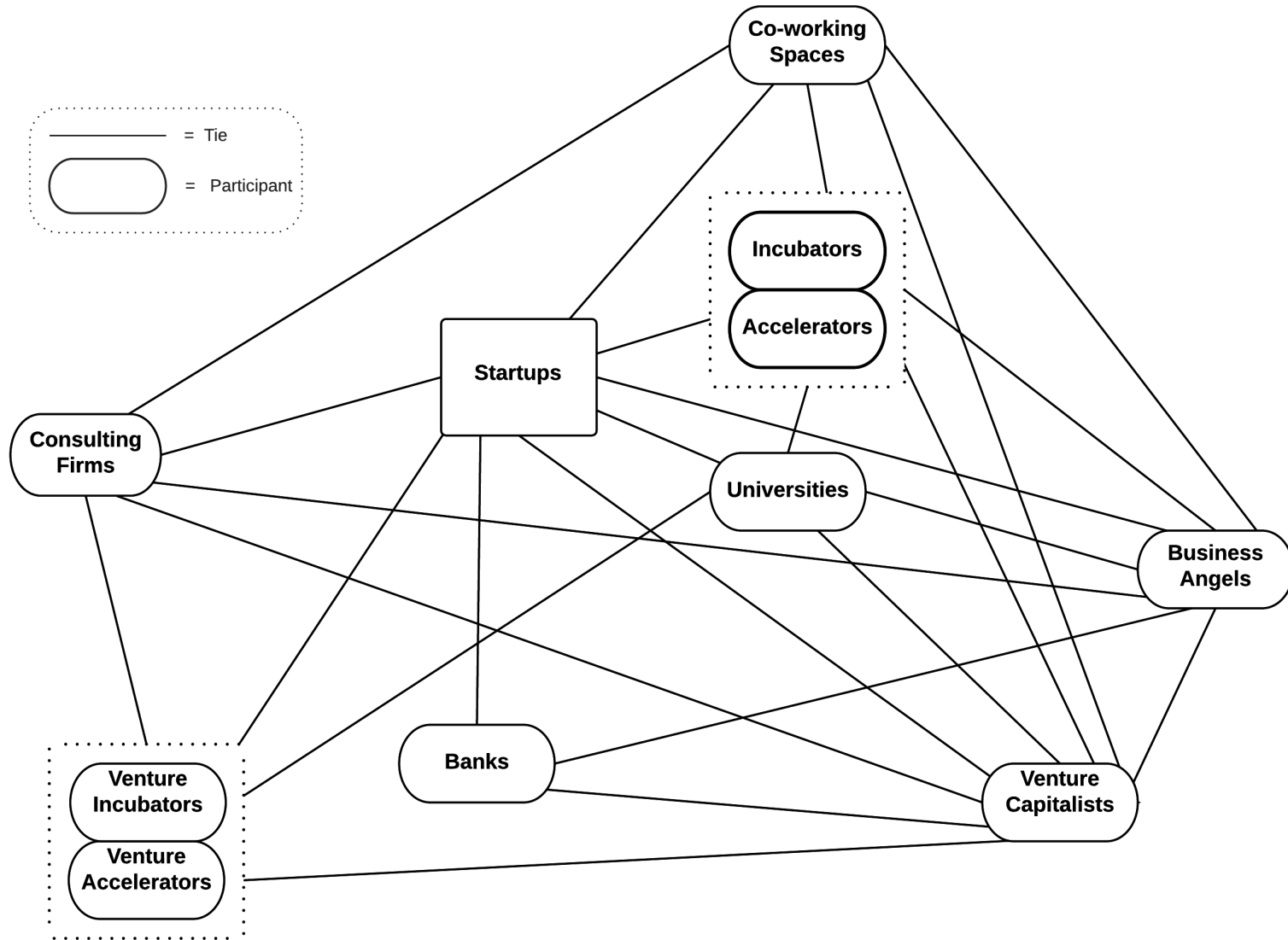


Fig.4.15: Ties Map – San Francisco Bay area
Source: Personal Elaboration

The Ties Map represent any kind of relationship among group of participants, both tangible or intangible. The high number of ties means that the network is considerably interconnected giving several clues for a more detailed analysis on its structure. All the main institutional roles, illustrated in the methodology section, are portrayed in the map except Media and Government; although they are vital for the ecosystem, for different characteristics, is it preferable to analyze them separately as independent entities:

- *Media*: the high technologic environment leading the innovation-driven ecosystem of the San Francisco bay, constituted by high volumes of information flows, brings media at the center of the network. They result to be extremely valuable for facilitating the exchange of intangible assets, lowering costs, and favoring the proliferation of the “myth” of Silicon Valley, through the celebration of the ecosystem successes all around the world. The principal media companies of the network are: *TechCrunch, Reddit, HuffPo, VentureBeat and SiliconValley.com*
- *Government*: government is considered as a separated entity since it acts as network controller having links with each participant. Its role is to foster the ecosystem health, bearing the exchange rules and encouraging the performance outcomes. In the Silicon Valley ecosystem analyzed they tend to promote a self-regulatory network in which they provide only the simplest institutional structures to start an entrepreneurial activity. The other rules are set automatically by the ecosystem participants through the employment of cooperative behaviors and trustful mindsets.

For easiness in comprehension, Accelerators and Incubators are grouped in the map due to evident structural equivalences in the services offered; in fact, the two entities both offer infrastructures, mentorship and training programs with the same structure and, even if they intervene in slightly different Startup phases: incubators in seed phases, accelerators also in later stages respectively, they have exactly the same linkages. This clarification anticipates the discussion on that field and narrow it, later, only to equivalences among the same participant group.

4.2.3 Silicon Valley Network analysis

Once depicted the network, having had a first impact on its main features and linkages, in this paragraph the research model will analyze the number and nature of each tie, considering that the total number of participants is 9, and giving as outcomes the most relevant structural features of the entrepreneurial ecosystem of the San Francisco bay.

Participant	Direct Ties	Indirect Ties	Tangible Exchanges	Intangible Exchanges
Startups	8	0	7	0
Venture Capitalists	8	0	2	6
Business Angels	7	1	2	5
Universities	5	3	0	5
Incubators/ Accelerators	5	3	1	4
Co-Working Spaces	5	3	1	5
Consulting Firms	5	3	1	5
Venture Incubators- Accelerators	4	4	2	4
Banks	3	5	1	2

Tab.4.9: Table of # and nature of ties – San Francisco Bay area
Source: Personal Elaboration

In the table above the principal characteristics of network linkages are summarized. The first consideration that must be made is that each participant of the ecosystem is directly or indirectly tied with every other institutional entity, highlighting the density of the network. For what concerns the nature of the ties, apart from Startups, it is clear from the table that the network has a predominance of intangible exchanges, making it an information and knowledge driven ecosystem.

Startups and Venture Capitalists are directly linked with every other participant of the ecosystem; while the first one is the only entity offering only tangible exchange, being the monetary engine of the ecosystem and providing the opportunity of huge earnings through onerous exits; the second one fully exploit their networking capabilities, organizing events

and exchanging opportunities' information, in order to gather insights on possible investments on innovative ideas and businesses with the aim of helping them to expand and be the next "Unicorn", having high paybacks. Similarly to VCs, Business Angels have a broad network being connected with almost all the participants with the exception of Venture Incub./Acc., because their features collide with the really early investments made by Angels usually in seed stage. Universities in the Bay are considered crucial for talents' generation and are directly involved in the ecosystem being constantly connected with Investors, that often back universities' events, and with support services companies such as Accelerators and Incubators, that offers personalized programs for students and graduates. A focus on Incubators and Accelerators highlights their connections with mentors coming from pure entrepreneurship or from a more technical background and their network made of collaborations with investors and other structures such as co-wo spaces in order to offer the best possible advices and mentoring services to their clients.

Venture Incub./Acc., differently, offer these services in exchange of their clients' equity, maintaining the same network connections. Co-working spaces are really well spread in San Francisco and nearby areas; they offer a pure front service made of affordable shared offices and shared technic infrastructure but, above all, they offer a place where meeting people, networking and sharing ideas and knowledge, giving the possibility to enter in contact with possible investors and proper training programs. Consulting firms provide a front service made of legal assistance needed by startups to better manage their equity share distribution and investments received but, especially, they offer their highly specialized knowledge of the ecosystem advising their clients with the aim of let them grow and succeed.

Also well established financial institutions as banks are focusing their efforts in entrepreneurial activities investments, due to the fact that they are the predominant businesses in the area. Furthermore, they actively participate to the network, collaborating with the other investment entities in programs of co-investment with the aim of supporting the entrepreneurial idea sharing the risks coming from that. However, compared to the other actors of the ecosystem, their different strategic mission and their culture and values linked to the past, bring them to only have direct connections with their clients and Investment companies, generating the majority of the structural holes illustrated in the following map.

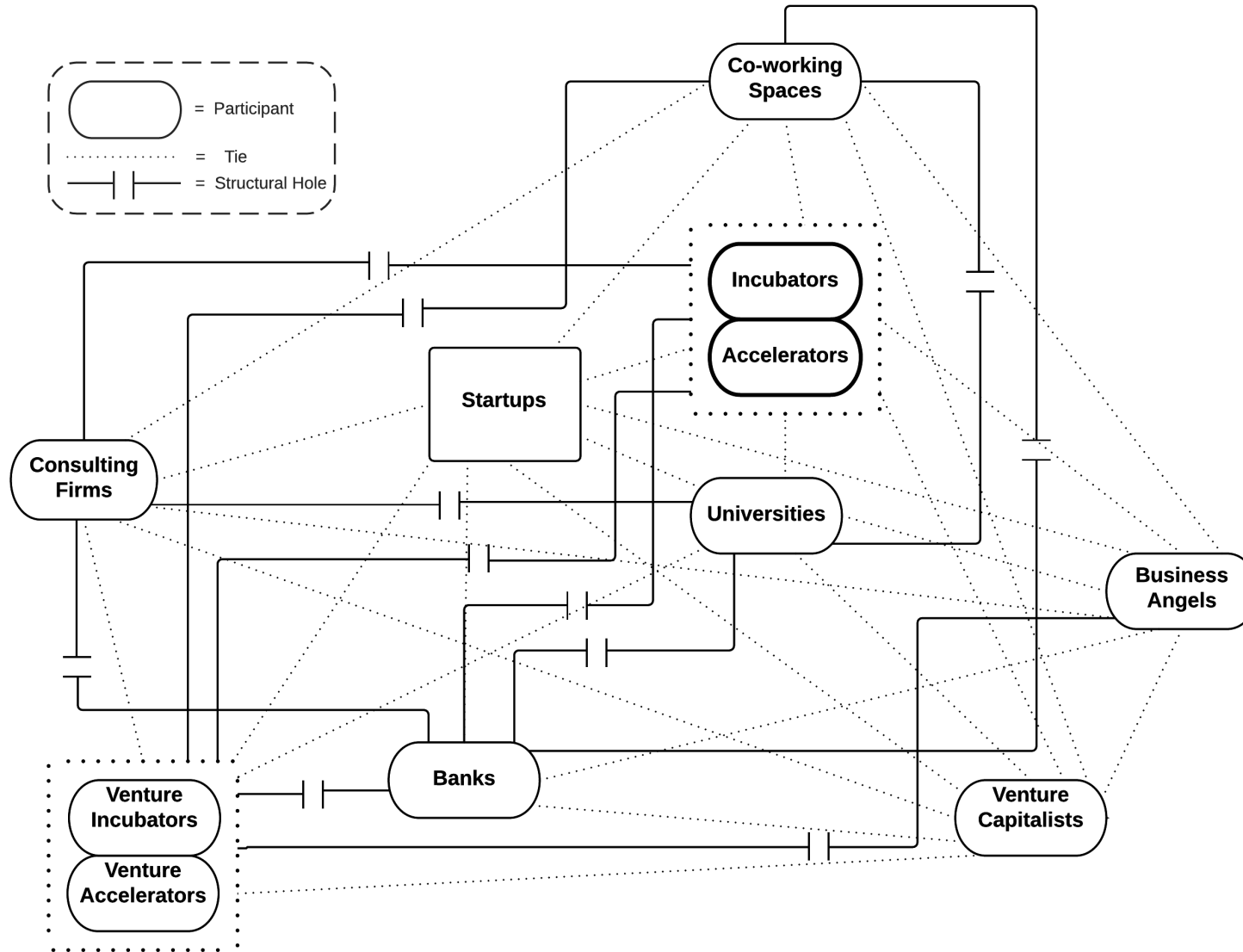


Fig.4.16: Structural Holes Map – San Francisco Bay area
 Source: Personal Elaboration

Structural Holes Map analysis

The Structural Holes map shows where direct connections are missing, obligating the two interested actors to pass through a third participant to gather any required information.

As outlined in the previous paragraph in a mostly dense network, banks are the ones having more structural holes and that is due to their intrinsic structured nature that impede them to fully modify their business to plumb into the ecosystem. Anyway, the majority of the depicted holes are due to participants' personal choices that bring them not to fully exploit an ecosystem that, on contrary, is extremely free and open to any kind of agreement among firms based on trustful mindsets, avoiding the raising of barriers or high transaction costs. These features, validated by the case studies analyzed, bring to a fluid network in which there is no necessity to be formally linked with everyone in the ecosystem to take advantage of the information sharing.

Moreover, the above map shows that direct ties, depicted with dotted lines, are much more numerous than structural holes underlying, once again, the dense and intertwined nature on the network.

The nature of San Francisco entrepreneurship ecosystem, thus, nurtures cooperative behaviors making easier and advantageous direct relationships among firms without any concern about redundant information among the network. Furthermore, the mindset developed in the ecosystem encourages the proliferation of high volumes of information defining it as the core characteristic that allows an entrepreneur to have a low cost infinite range of service opportunities.

The concept of redundant information introduces the analysis of structural equivalences, useful for the analysis of the dynamics of the network.

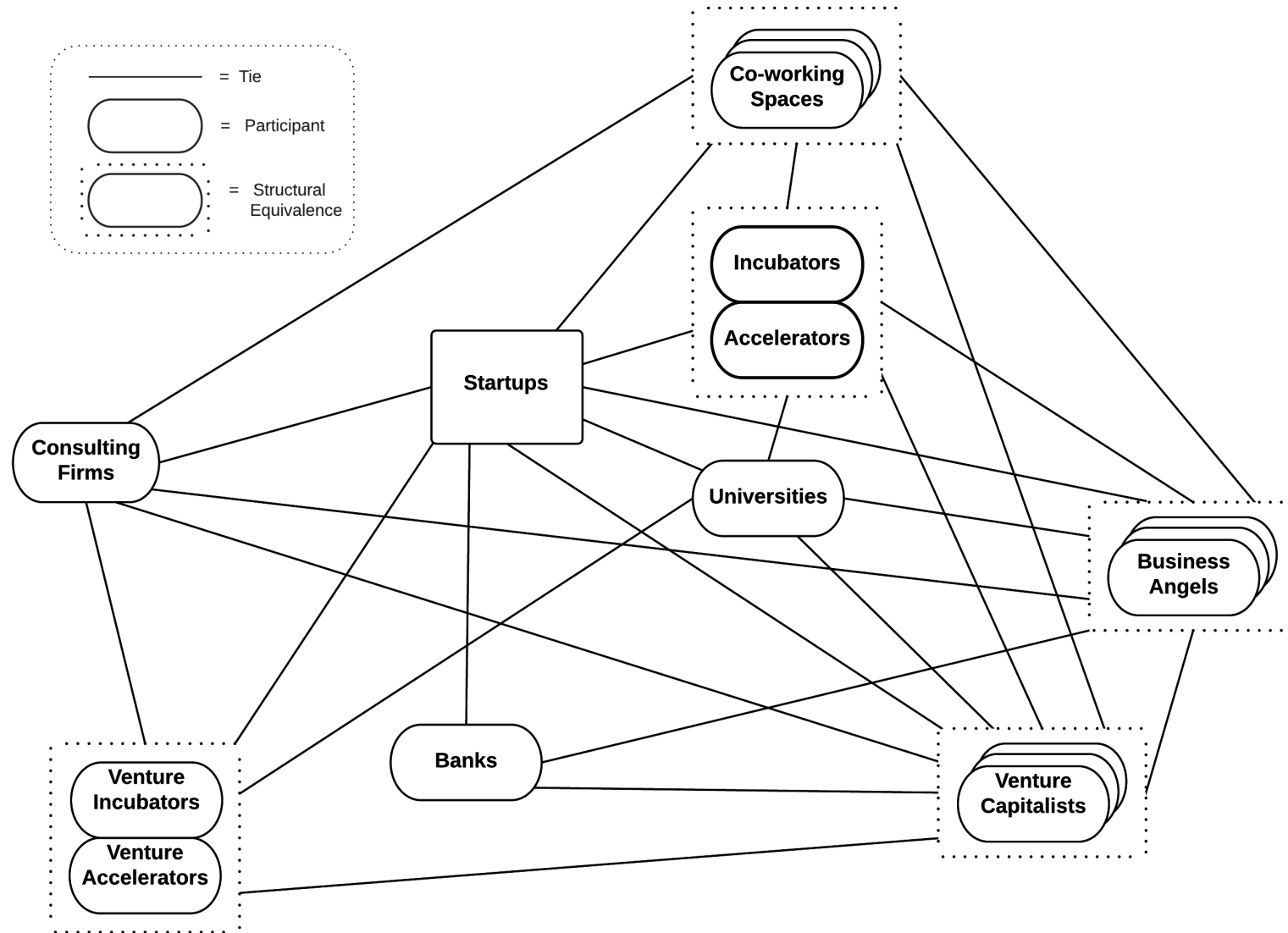


Fig.4.17: Structural Equivalences Map – San Francisco Bay area
 Source: Personal Elaboration

Structural Equivalences map analysis

The structural equivalences map illustrates all the group of companies holding a similar position within the network through an intuitive dotted circle around them. While equivalences among different group of participants were already presented in the previous maps for a better understanding of the network structure, similarities among companies of the same groups necessitate a further analysis in this paragraph.

The above map shows that 4 out of 9 groups are subject to structural similarities and the consequence in any ecosystem around the world would be an increase in competition and a loss in efficiency of the network. However, the “Silicon Valley” ecosystem developed an underlying business procedure based, one more time, on Trust and underlying open mindset that overcomes the possibility of an increase in competition nurturing an even more collaborative approach.

The high number of investors (371) conducting similar activities, being them Venture Capitalists or Business Angels, other than pumping money in the ecosystem favoring entrepreneurs, force them to collaborate and share information, co-investing in the same companies and sharing the related risks.

Co-investments bring advantages in both sides: entrepreneurs maintain a higher control on their company, having higher shares compared to a group of investors; and investing companies can enlarge their portfolios mitigating sufficiently their risks.

The numerous co-working spaces present in the ecosystem (46), instead, support the development of a strong networking approach aimed at offering high level services and it does not give rise to competitive behaviors because of the continuing increasing number of entrepreneurs populating the Bay. Entrepreneurs itself (7723 Startups), are not depicted as structurally similar in the above map, since their ideas cannot be considered as equivalent; even if many talents can come out with really similar ideas, their background, their needs and, consequently, their value to the ecosystem is always different, avoiding any kind of inefficiency in the network.

In general, the particular density and high-volumes of the resources offered by the ecosystem constitute an incredible Ecosystem strength, generating a phenomenon called “social credit” by insiders, that is directly related with trust, and that constitutes the distinctive willingness to help and availability of everyone in the network to share information and strategic insights. This feature comes from the fact that, being such a

dense system, if you don't help someone, someone else will do that, gaining social credit that will be taken into consideration when there will be an important success to share.

Outcomes

The previous analysis gives several clues concerning the structure and the dynamics of the network that help the research to identify the principal features of the ecosystem:

1. ***Closed System:***

The network map and analysis highlight the density and interconnection of the ecosystem; the number of direct ties (25) is relevantly high, and outnumbers the indirect ties, that generate structural holes. Moreover, the configuration of the network allows every participant to be connected with each of the other actors, directly or indirectly. As a consequence, considering the fact that a pure closed system is almost impossible to find in a real ecosystem, the San Francisco entrepreneurial ecosystem can be classified as a Closed system. This configuration results to be highly beneficial in turbulent and information-based network and, coupled with a trustful environment and a cooperative mindset, constitutes the most effective pattern for the analyzed ecosystem.

2. ***No Focal:***

The analysis made on the configuration of the network, focusing on each participant's ties and structural holes, combined with the nature of the ecosystem, characterized by collaborative behaviors and low-cost informal agreements, drives the structure of the network maintaining a horizontal configuration and avoiding each attempt of gaining dominant position among others. This consideration is fundamental for the success and sustenance of the ecosystem due to the fact that any opportunistic behavior or any power abuse will rapidly transform its dynamics bringing to inefficiencies and to a centralization of the source of value. Even if Startups are considered the only source of high monetary earnings, they cannot take the liberty of controlling the ecosystem because they will not thrive without the prosperous support structure made by Investors, Mentors, Institutions and shared infrastructures. In conclusion, the network's configuration does not comprehend the presence of a focal linking all the other participant and setting constraints but, on contrary, must be considered as a horizontal system and that is what makes it the best practice in Entrepreneurship.

4.2.4 Silicon Valley Strategic Value analysis

This paragraph aims at analyzing, at a company-level, the value exchanges flow among firms. The research will focus on the assessment of the impact on performances of each input received by the analyzed participant, from the surrounding ecosystem, the evaluation of the value added by the participant to the environment and the strength of strategic relationships among each of them. The output will be a detailed chart of each atomistic exchange with the aim of strategically mapping the Silicon Valley environment and assessing the performances of the ecosystem both on company-level both on entire ecosystem-level. Leveraging the Value network and Strategic network theories, the performance is measured by the research as tangible and intangible value creation, focusing first, on the ability of each actor to capture value from the ecosystem, then on the value captured by the ecosystem considered holistically. The following analysis illustrate separately inputs and outputs received by each participant, addressing a numerical value to each exchange, with the purpose of assessing the Value generated by the ecosystem as input and the costs of Value added as output.

The evaluation is made through a weighted average of the answers gathered from the case studies with a Likert scale approach weighted on Consensus. Consensus is a value that spans from 0 to 1, that adjust mean values analyzing the patterns of the interviewees answers. For further details on the calculation see empirical Methodology and Appendix 7.1.

Startups

This category is composite by each entrepreneurial venture headquartered in San Francisco; and being a source of high risky earnings, they constitute the tangible side of the ecosystem. The extraordinary success of the Silicon Valley area brings many talented entrepreneurs to immigrate in the Bay establishing the highest Startup density of the planet. They fully exploit the ecosystem being connected with all the other participants in order to gather their support services in exchange of tangible assets such as equity shares or money.

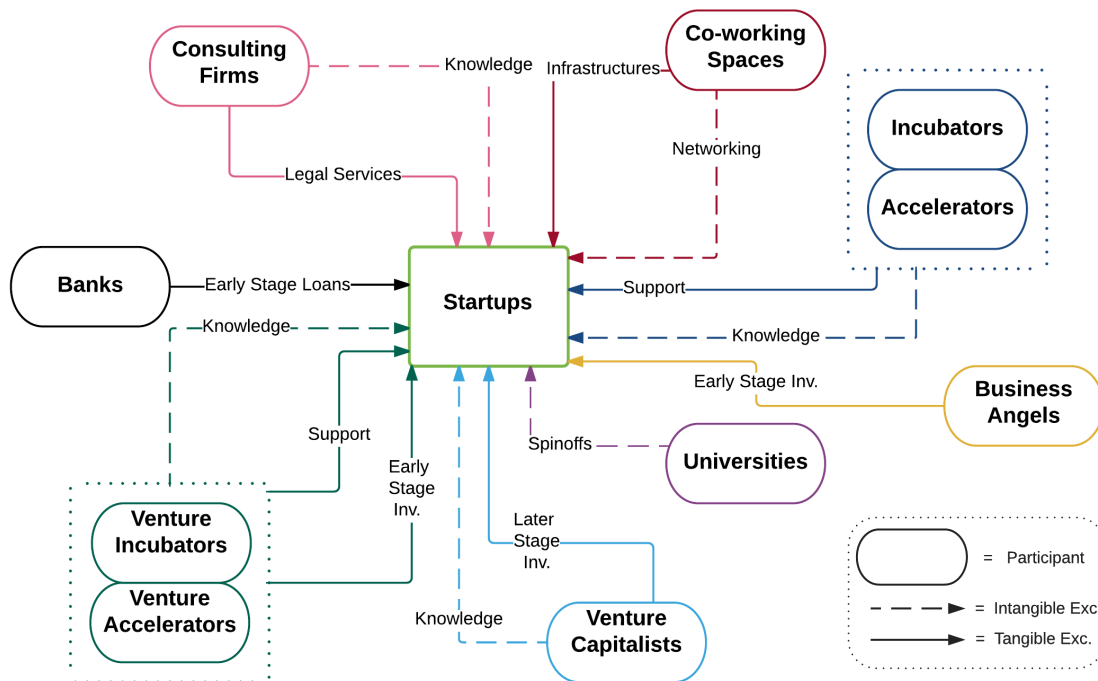


Fig.4.18: Startups Inflows
Source: Personal Elaboration

The following tables illustrate the Value Impacts of the ecosystem on the analyzed entity and the costs held by the participant for adding value to the same ecosystem; these two different evaluations allow the research to calculate respectively the Value Generated and the Value Added costs for each participant. The numerical calculations are based on the multiple case study interviews and assessed with a Likert scale weighted on Consensus:

$$Consensus = 1 + \sum_{i=1}^n p_i * \log_2 \left(1 - \frac{|X_i - \mu_x|}{d_x} \right)$$

p_i = probability of outcome X_i

μ_x = mean of X

$d_x = X_{max} - X_{min}$

INPUT	From	Description	Tang. / Intang.	Impact
Legal Services	Consulting Firms	Any legal support from the company establishment to fund raising and equity agreements	T	3,20
Knowledge	Consulting Firms	Hints on principal processes such as technical or marketing partnerships with other actors	I	1,69
Infrastruct.	Co-wo spaces	Shared office rooms with principal related services	T	3,20
Networking	Co-wo spaces	Community, introduction in the network, events guidance	I	2,40
Support	Incubators/ Accelerators	Mentorship training programs (technical, marketing)	T	3,14
Knowledge	Incubators/ Accelerators	Hints on possible investment opportunities, community	I	3,00
Early Stage Inv.	Business Angels	Small investments in really early Startup stages, usually seed stage	T	5,00
Spinoffs	Universities	Talents' generation and ideas spinoffs	I	2,40
Later Stage Inv.	Venture Capitalists	Big investments in A and B stages	T	3,20
Knowledge	Venture Capitalists	Hints on network dynamics, business advices, co-investments opportunities	I	1,69
Early Stage Inv.	Venture Acc./Incub.	Small investments to support mentored startups in their early phases	T	2,41
Support	Venture Acc./Incub.	Mentorship training programs (technical, marketing)	T	5,00
Knowledge	Venture Acc./Incub.	Hints on network dynamics, past success stories sharing, community	I	2,65
Early stage loans	Banks	Risky loans at affordable interest returns	T	1,93
				40,91

Impact: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.10: Startup ecosystem Impacts Table

Source: Personal Elaboration

The high number of inputs received by Startups reflects the intrinsic nature of the ecosystem, aiming to support entrepreneurs through a wide selection of services. Investments and mentorship programs have a really high impact on performances, representing the vital nourishment and knowledge. On contrary, banks' loans represent a smaller impulse for Startups business activities having the trade off of onerous interests. Worthy of attention are also the other intangible exchanges constituting a solid info sharing base.

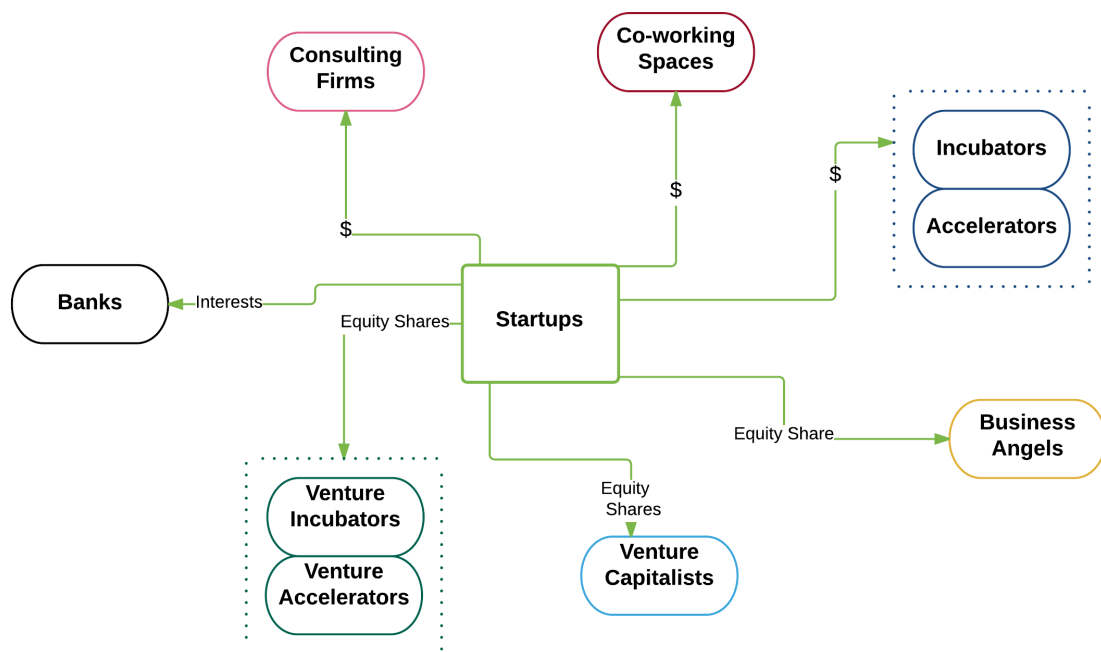


Fig.4.19: Startups Outflows
Source: Personal Elaboration

OUTPUT	To	Definition	Tang./ Intang.	Value Added Cost
Money	Consulting Firms	Payment for legal & business services	T	1,21
Money	Co-Working Spaces	Payment for shared infrastructures	T	1,93
Money	Incubators/ Accelerators	Payment for mentorship programs	T	2,40
Equity Share	Business Angels	Own company shares exchanged for monetary investments	T	4,00
Equity Share	Venture Capitalists		T	4,00
Equity Share	Venture Incub./Acc.		T	2,40
Interests	Banks	Interests payment	T	1,69
				17,63

VA cost: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.11: Startup Value Added Costs Table
Source: Personal Elaboration

Startup outputs are characterized by their complete tangible nature; they, in fact, represents alone almost the half of the total tangible exchanges, due to the fact that they are the monetary center of the ecosystem and they have to pay for the ample services made available by the ecosystem.

The sum of all the input gives us the value generated by the ecosystem, while the one of outputs returns the costs for participating to it. Subtracting the costs sustained by the participant to the value benefits it receives, the analysis arrives to a number representing the value captured.

Startups total Value Inflows	40,91
<i>(i.e. Value Generated by the ecosystem for the Startup)</i>	
Startups total Value Outflows	17,63
<i>(i.e. Value Generated by the startup for the ecosystem, and associated effort)</i>	
Startups Value Capture	23,28

The resulting value clearly denote the advantageous environment available for entrepreneurs legitimizing the prominent volume of immigrants coming to San Francisco bay every year to exploit the ecosystem network. The unique dynamics driving the Silicon Valley network, composite by collaborative behaviors and a trustful mindset results in generally low costs for delivering outputs due to the highly informal nature of contracts that lower the transaction costs. Moreover, the structure of the ecosystem brings to a really high value generated by the surrounding participants that double the second highest amount in the network highlighting the inimitable benefits of being part of such an interconnected system.

Venture Capitalists

Venture capitalists are considered the “nourishment” of an Entrepreneurial Ecosystem, and their elevate concentration in the Valley constitute a huge value added for the Environment. They basically provide money to early-stage startups (A-B stages) in exchange of equity, investing third-party capitals; typically, their investments occur after a seed funding round held by Business Angels and Venture Incubators. VCs, like Startups, fully exploit the ecosystem having a capillary network of knowledge and information sharing that allow them to collaborate with others in terms of co-investments and events organization being always up to date of innovative ideas and technologies.

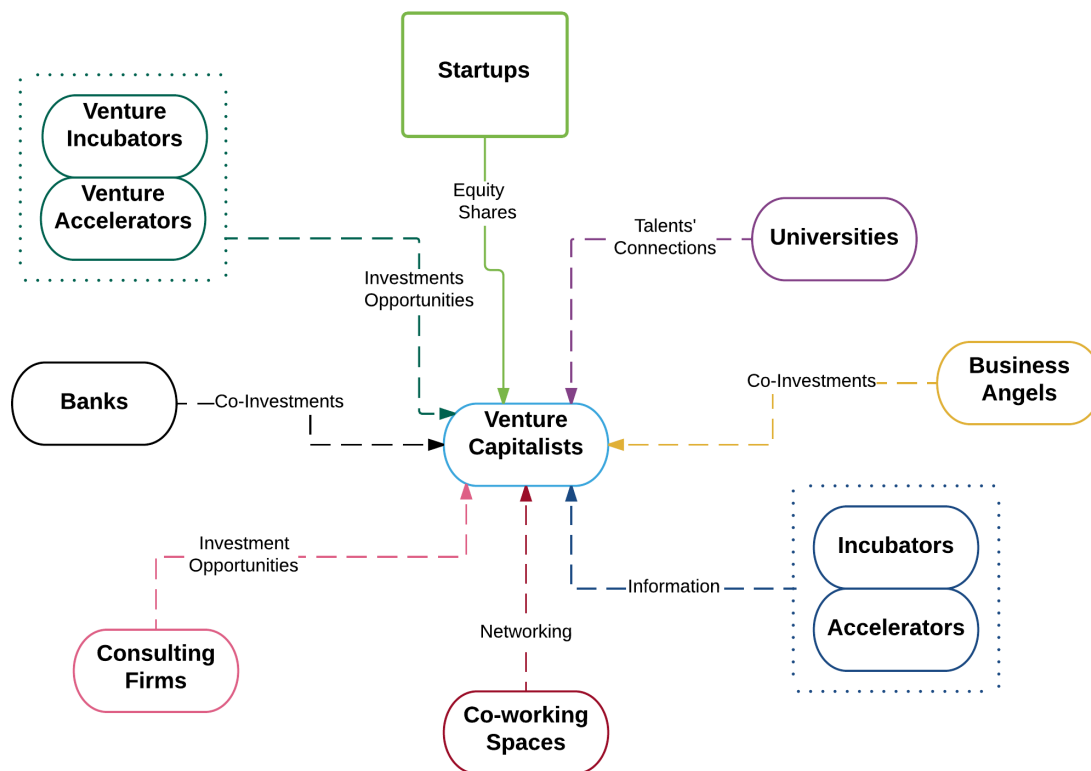


Fig.4.20: Venture Capitalists Inflows
Source: Personal Elaboration

Input	From	Description	Tang. / Intang.	Impact
Equity Shares	Startups	Startup shares exchanged for monetary investments	T	3,38
Talents' Connections	Universities	Possibility to enter in contact with talented students through events and pitch contests	I	1,54
Co-Investments	Business Angels	Sharing of information and investments strategies to collaborate, share risks and help their backed startups to succeed	I	2,96
Information	Incubators/ Accelerators	Information sharing concerning known startups, their lacks and their possibility to exploit the market	I	2,38
Networking	Co-Working Spaces	Information on startup trends and volumes	I	0,96
Investment Opportunities	Consulting Firms	Information on new clients opportunities and backgrounds	I	2,41
Co-Investments	Banks	Sharing of information and investments strategies to collaborate, share risks and help their backed startups to succeed	I	2,65
Investment Opportunities	Venture Incub./Acc.	Possibility to collaborate for later stage investments	I	2,15
				18,43

Impact: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.12: Venture Capitalists ecosystem Impacts Table

Source: Personal Elaboration

The highest impact on Venture capitalists' performances is given by their core activity focused on raising equity shares from Startup companies; the highly risky investments they made, are, in fact, potentially extremely valuable, considering the average exit returns of the San Francisco bay area. Other than that, noteworthy are the co-investments opportunities they receive from other investors in the form of sharing strategic information and strongly act on networking. Finally, they are strongly interconnected with educational centers, through the sponsoring of Investors' university events and real pitch contest in order to advise students and get in touch with future talents.

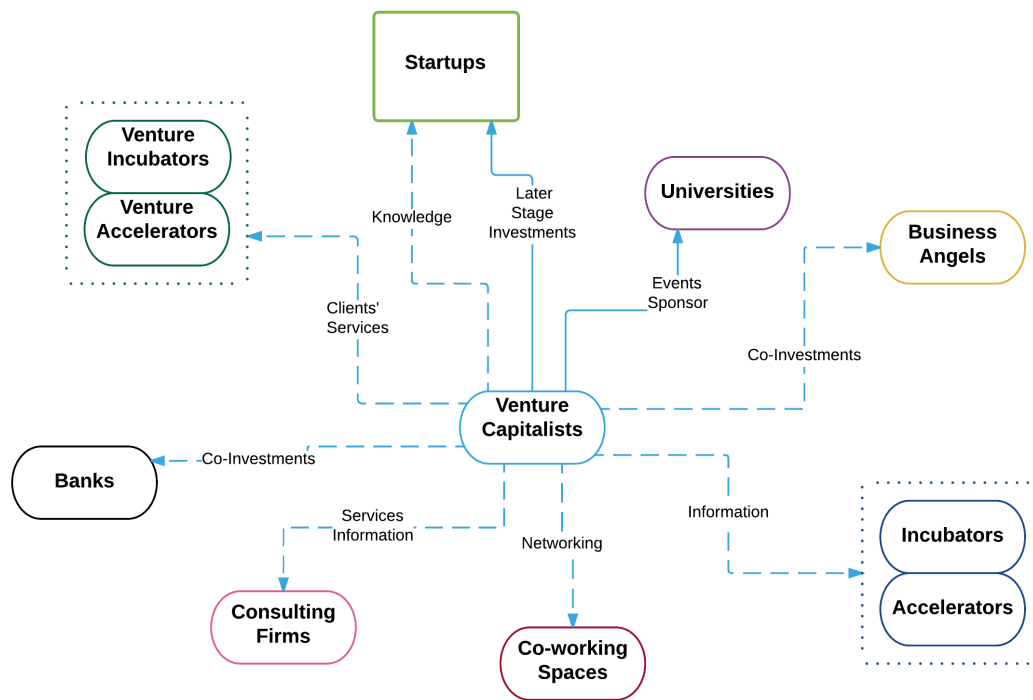


Fig.4.21: Venture Capitalists Outflows
Source: Personal Elaboration

Output	To	Definition	Tang./ Intang.	Value Added Cost
Knowledge	Startups	Hints on network dynamics, business advices, co-investments opportunities	I	0,96
Later Stage Inv.	Startups	Big investments in A and B stages	T	3,15
Events Sponsor	Universities	Organization of pitch contests and panels to create a bridge between universities and entrepreneurship	T	1,82
Co-Investments	Business Angels	Sharing of information and investments strategies to collaborate, share risks and help their backed startups to succeed	I	2,66
Information	Incubators/ Accelerators	Information on investments trends and mentorship panel organization	I	1,05
Networking	Co-working Spaces	Informal meeting and events to share experiences and new startups trends	I	1,37
Services Information	Consulting Firms	Hints on investment procedures in order to create possible collaborations	I	1,21
Co-Investments	Banks	Sharing of information and investments strategies to collaborate, share risks and help their backed startups to succeed	I	2,66
Clients' Services	Venture Incub./Acc.	Investments' trends and clients mentorship collaborations	I	1,69
				12,22

VA cost: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.13: Venture Capitalists Value Added Costs Table
Source: Personal Elaboration

In order to maintain a constant invested base and be up to date with the innovative trends, Venture Capitalist are encouraged to exploit any kind of connection with the aim of being a constant presence in the ecosystem and be the first to back successfully ideas. The highest costs derive from the tangible monetary volumes necessary to support startups in their A-stages with an average of 5-10mln \$ for each client. The other exchanges costs, prevalently intangible, are kept low by the ecosystem nature that facilitates the exchange of information flows and promote the willingness to help the neighbor.

VCs Value Generated	18,43
VCs Value Added Cost	12,22
VCs Value Capture	6,21

The analysis of Value generated and costs of value added results again in a positive Value Capture that highlights the benefits present both on the side of investors and backed companies. In this case, the contribution of the ecosystem is smaller, reflecting the average values and this brings to a lower margin maintaining, however, a strategic advantageous position that allows them to profit by being part of the Silicon Valley entrepreneurial network.

Business Angels

Typically combined with Venture Capital fund, Business Angels are instead quite different; they are, in fact, former businessmen investing their own capital in seed-early stage of Startup companies in exchange of equity. The high-risky nature of the investment due to the early stage commitment, allow them to request high equity shares and, consequently, to have significant multipliers in case of success allowing them to maintain large diversified portfolios. Similarly to VCs, they take advantage of the Silicon Valley almost comprehensively, leveraging their intuition and their experienced background in exchange of talents' connections.

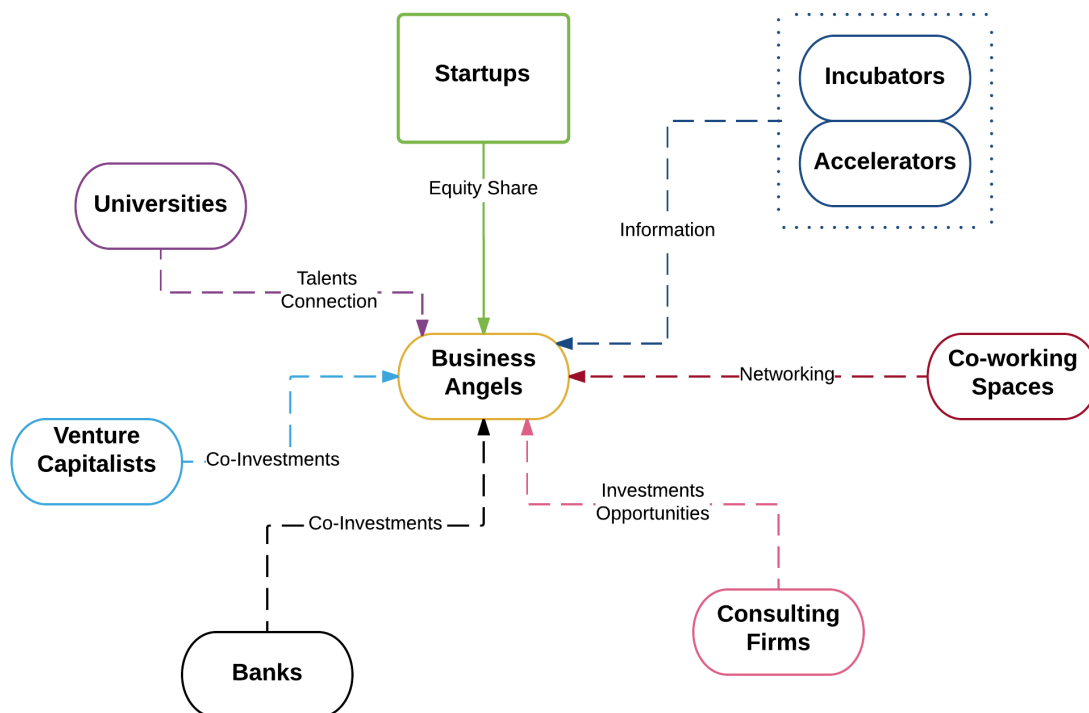


Fig.4.22: Business Angels Inflows
Source: Personal Elaboration

Input	From	Description	Tang. / Intang.	Impact
Equity Share	Startups	Startup shares exchanged for monetary investments	T	4,00
Information	Incubators/ Accelerators	Information sharing concerning known startups, their lacks and their possibility to exploit the market	I	2,65
Networking	Co-working Spaces	Information on startup trends and volumes	I	3,00
Investment Opportunities	Consulting Firms	Information on new clients opportunities and backgrounds	I	1,69
Co-Investments	Banks	Sharing of information and investments strategies to collaborate, share risks and help their backed startups to succeed	I	2,40
Co-Investments	Venture Capitalists		I	3
Talents Connection	Universities	Possibility to enter in contact with talented students through events and pitch contests	I	3,20
				19,94

Impact: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.14: Business Angels ecosystem Impacts Table
Source: Personal Elaboration

Business Angels, likewise Venture capitalists, achieve highest performance impacts from the Startup equities, that give them high potential returns. Their early investment approach brings them to benefit favorably from contacts with talented students introduced to them by universities through the co-organization of innovation events and contests. Moreover, Angels capitalize on their networking ability receiving as inputs many information on the market and latest innovation trends, coupled with strategic proposals of co-investment opportunities from other investors. Co-investment approach is spread all over the network with the aim of sharing risks and enlarge their investment portfolio, raising the payback probabilities.

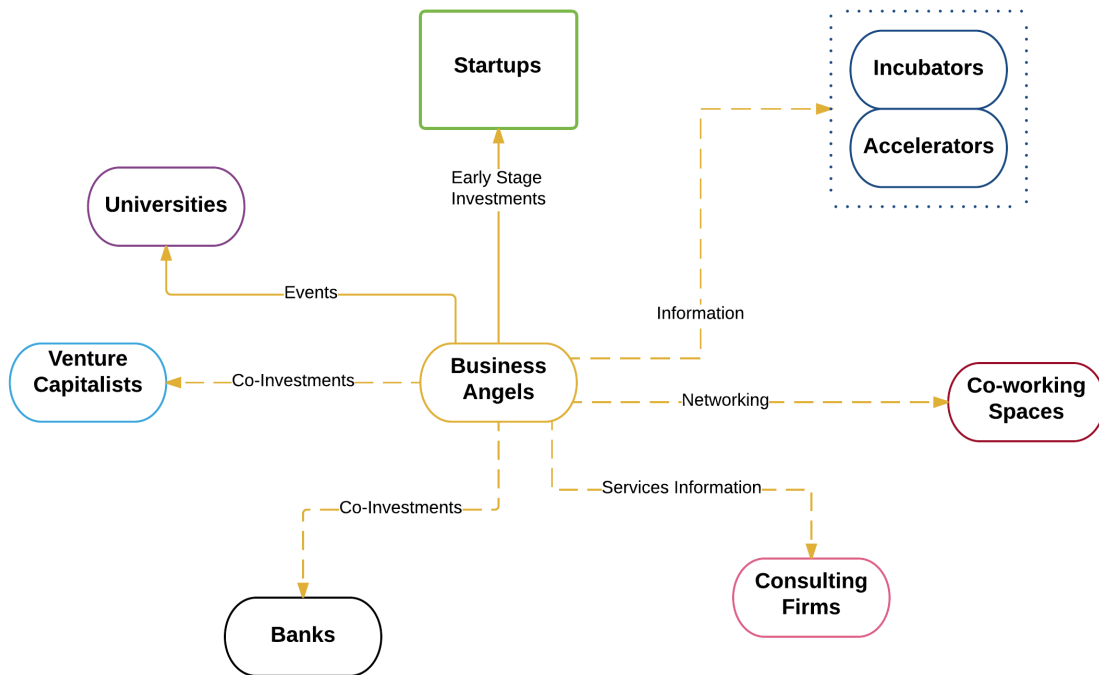


Fig.4.23: Business Angels Outflow
Source: Personal Elaboration

Output	To	Definition	Tang. / Intang.	Value Added Cost
Early Stage Inv.	Startups	Small investments in really early Startup stages, usually seed stage	T	5,00
Information	Incubators/ Accelerators	Information on investments trends and mentorship panel organization	I	1,60
Networking	Co-Working Spaces	Informal meeting and events to share experiences and new startups trends	I	1,69
Services Information	Consulting Firms	Hints on investment procedures in order to create possible collaborations	I	0,96
Co-Investments	Banks	Sharing of information and investments strategies to collaborate, share risks and help their backed startups to succeed	I	1,93
Co-Investments	Venture Capitalists		I	1,93
Events Sponsor	Universities	Organization of pitch contests and panels to create a bridge between universities and entrepreneurship	T	3,00
				16,11

VA cost: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.15: Business Angels Value Added Costs Table
Source: Personal Elaboration

For what concerns the outflows costs of the value that Business Angels add to the ecosystem, it consists principally by their monetary seed early-stage investments in innovative Startups that spans from 300k \$ to 600k \$ and withstand entrepreneurs' businesses in their initial critical phases.

Then, they support the intangible linkages among investor giving access to insights on their strategic plans and sharing their personal knowledge. Finally, they exploit the network exploiting informal connections with co-working spaces, consulting firms and accelerators; making possible the correspondent network benefits deriving from it.

BAs Value Generated	19,94
BAs Value Added Cost	16,11
BAs Value Capture	3,83

The Value Capture derived is still positive, but relatively low due to the fact that their private funds nature forces them to an investment power lower than the other financial participants, and their really early stage investment results in a lower probability of success. However, the favorable environment and their ability to connect with other actors at a low cost results in a strategic beneficial positioning in the network.

Universities

Although there is a notable density of universities in the south Californian area, the concept of entrepreneurship, technological innovation and education is entirely attributable to the Stanford University. The university has incubated ideas, educated entrepreneurs and fostered breakthrough technologies that have been instrumental in the rise and constant regeneration of Silicon Valley and, at the same time, contributed to the broader global economy. The university encourages networking and collaborations across disciplines and schools, offers opportunities for testing ideas and encourages students to become involved in research and prototype their ideas. It is in constant collaboration with the most proficient Investors and Incubators, offering a solid bridge between the education and the entrepreneurial world.

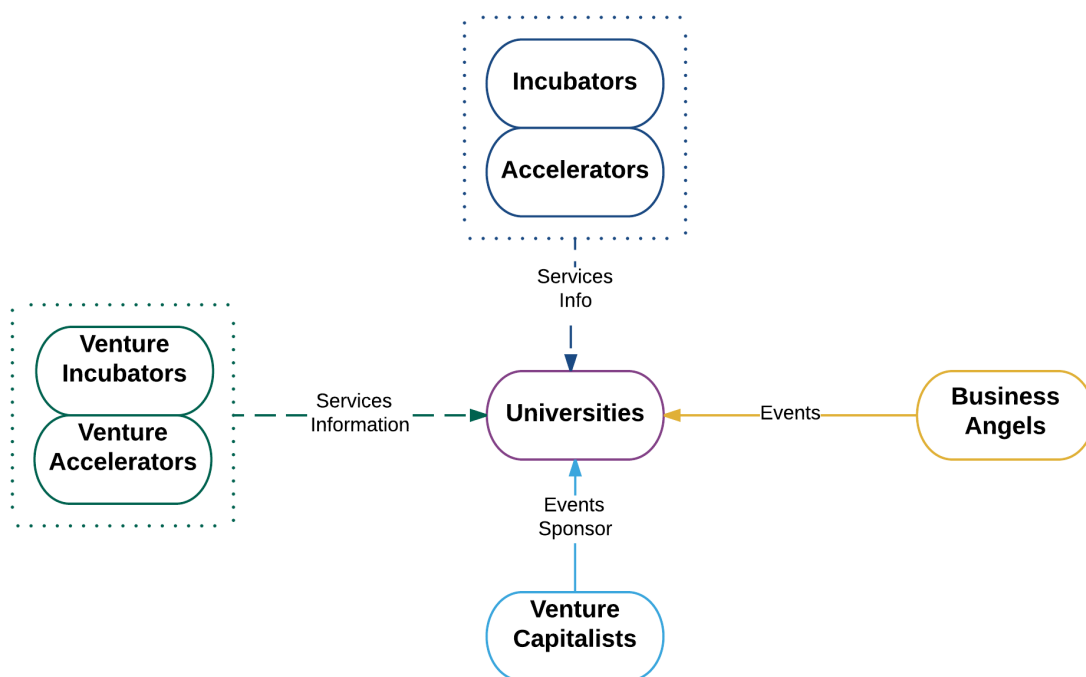


Fig.4.24: Universities Inflows
Source: Personal Elaboration

Input	From	Description	Tang. / Intang.	Impact
Services Info	Incubators/ Accelerators	Information on mentorship plans available for students	I	1,69
Events Sponsor	Business Angels	Organization of pitch contests and panels to create a bridge between universities and entrepreneurship	T	2,15
Events Sponsor	Venture Capitalists		T	2,78
Services Information	Venture Incub./Acc.	Hints on investments procedures and mentorship plans	I	1,69
				8,31

Impact: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.16: Universities ecosystem Impacts Table

Source: Personal Elaboration

Universities have an important role in the San Francisco area since they supply the ecosystem with young talented future entrepreneurs providing them a solid theoretical base on innovation and entrepreneurship and organizing panels with the participation of other network actors almost weekly.

On the opposite side, they receive sponsorships by main investors in the Valley to organize events and pitch events with the aim of training their students and giving an entrepreneurial approach to their study programs. Even Incubators program proposals have an impact on their performance since they facilitate the information flow among universities' infrastructures adding value to their academic programs.

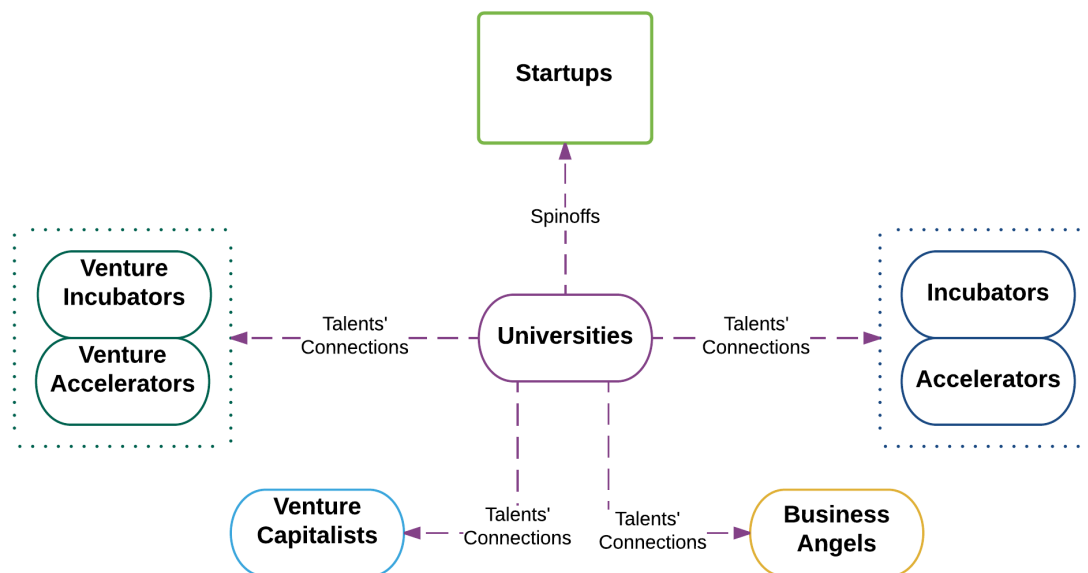


Fig.4.25: Universities Outflows
Source: Personal Elaboration

Output	To	Definition	Tang. / Intang.	Value Added Cost
Spinoffs	Startups	Talents' generation and ideas spinoffs	I	1,82
Talents' Connections	Incubators/ Accelerators	Chance of gathering new clients directly from university through events and collaborations	I	1,21
Talents' Connections	Business Angels	Possibility to enter in contact with talented students through events, panels and pitch contests	I	1,93
Talents' Connections	Venture Capitalists		I	2,65
Talents' Connections	Venture Incub./Acc.		I	1,60
				9,21

VA cost: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.17: Universities Value Added Costs Table
Source: Personal Elaboration

Universities outflows are entirely intangible, being based in most cases by information connections among their students and the other ecosystem participants. The principal outflows, even if not expensive, are the spinoffs universities guarantee to the network in the form of new entrepreneurial activities. Secondary, academies in San Francisco bay work hard for establishing a continuing bridge between theoretical education and practical entrepreneurial knowledge, organizing frequently events with the aim of establishing a first contact between their talents and proficient investors or structured incubator programs organizer.

Universities Value Generated	8,31
Universities Value Added Cost	9,21
Universities Value Capture	-0,90

The analysis of the ability of capturing value by universities brings to the only result slightly negative of the entire ecosystem. The relatively low Value generated from the system must be isolated to the entrepreneurial perspective of the academy, that is only one of the ecosystems in which it is present. The highest value generated by being part of the entrepreneurial network for universities is the increase of reputation, that allows them to reach high numbers of applications bringing essential monetary returns. However, this outcome is not taken into consideration in our analysis being outside of the value exchanges pertaining to our research work.

In conclusion, even if it seems that universities are not capturing value they have to maintain their strategic position for two reasons: first, they are raising value in the form of reputation, critical for their business but outside our analysis scope; and second, they constitute the nourishment of the entrepreneurial ecosystem that is the driving force of the South California economy and a different strategy will affect directly their entire institutional figure.

Incubators / Accelerators

Incubators & Accelerators are companies helping Startup firms to develop by providing services through the institution of training programs. These programs span among all the activities an entrepreneur should know to take advantage of innovative ideas and exploit the market. Usually, the most common incubators/accelerators services are: mentoring, marketing assistance, networking activities, accounting/financial management, presentation skills, team management, and so on. Although Incubators and Accelerators are considered structurally equivalent, since their service package is almost the same, they have a slightly different intervention approach: while incubators offer 6-12 months' programs for seed-early stage startups, accelerators offer 3-6 months' programs addressed also for later stages. The figures below illustrate their network and the impacts and costs they have from it.

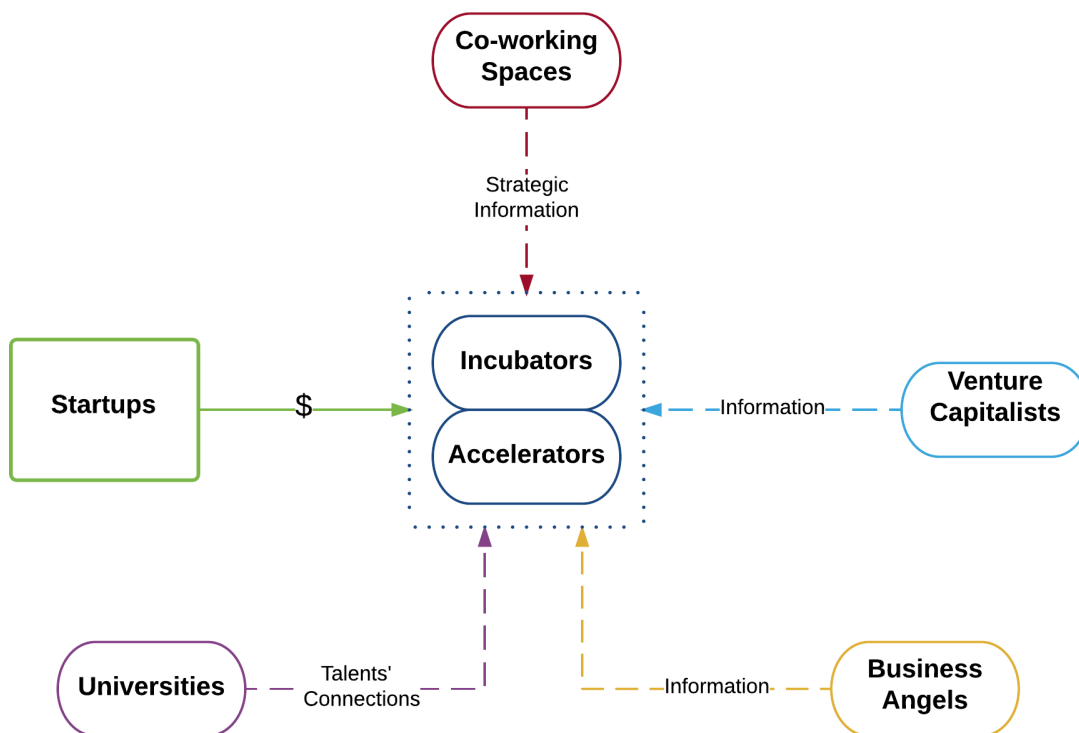


Fig. 4.26: Incubators/Accelerators Inflows
Source: Personal Elaboration

Input	From	Description	Tang. / Intang.	Impact
Strategic Information	Co-Working Spaces	Information on startups' needs and possible strategic collaborations	I	1,21
Information	Venture Capitalists	Information on investments trends and mentorship panel organization	I	2,40
Information	Business Angels		I	2,41
Talents' Connections	Universities	Possibility to show their services to students through universities events	I	3,20
Money	Startups	Payment for mentorship programs	T	3,38
				12,6

Impact: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.18: Incubators/Accelerators ecosystem Impacts Table

Source: Personal Elaboration

Incubators and Accelerators base their performance success on their ability to reach high numbers of application demands for their business mentorship programs. Given that, the most impacting inflow is constituted by the monetary payment they receive from entrepreneurs taking advantage of their programs. Extremely important is also the connection to talents they receive through universities, since they offer business basics services or introductions to basic service assistance, really useful for young talented students willing to start their own business. Other than that, they exploit the density of the network sharing information with other participant like co-wo spaces and investors receiving valuable insights on innovative trends and investment programs they successively propose to their clients adding value to their offer and giving future investment connections to the entrepreneurs they mentor.

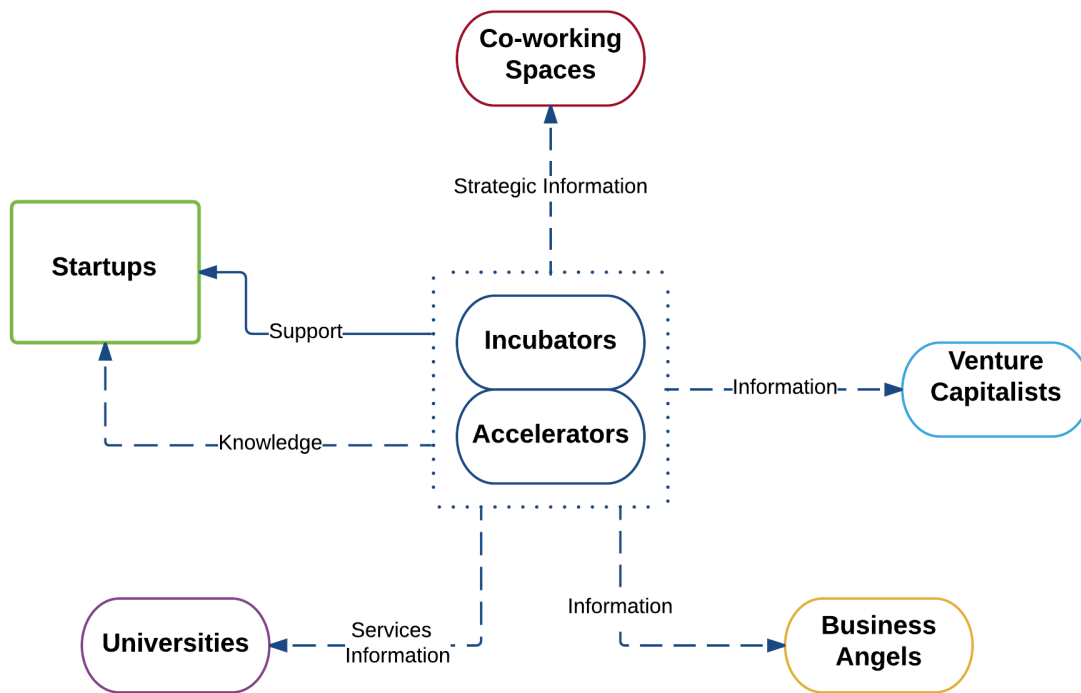


Fig.4.27: Incubators / Accelerators Outflows
Source: Personal Elaboration

Output	To	Definition	Tang. / Intang.	Value Added Costs
Strategic Information	Co-Working Spaces	Hints on mentored startups and strategic clients proposal	I	2,00
Information	Venture Capitalists	Information sharing concerning known startups, their lacks and their possibility to exploit the market	I	1,21
Information	Business Angels		I	1,21
Services Information	Universities	Information on mentorship plans available for students	I	1,00
Knowledge	Startups	Hints on possible investment opportunities, community	I	1,60
Support	Startups	Mentorship training programs (technical, marketing)	T	3,14
				10,16

VA cost: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.19: Incubators/Accelerators Value Added Costs Table
Source: Personal Elaboration

Concerning the outflows, Incubators & Accelerators core offer is strictly related with their training programs that need an effort both on leveraging their network both on tangible organization matters. For that reasons, the most expensive output is the organization of mentorship training program oriented to entrepreneurs. Other than programs, especially in the Silicon Valley, incubators offer a parallel intangible service based on the “social

credit” approach; thanks to which they allow their clients to enter in contact with investing entities and other network participants, introducing friends and friends of friends, with the aim of exploit the ecosystem and collaborate on many projects. With the same approach, they share strategic information on their programs with other actors, taking advantage of the informal nature of relationships present in the Valley that results in several interconnections at accessible costs.

Incubators & Accelerators Value Generated	12,60
Incubators & Accelerators Value Added Cost	10,16
Value Capture	2,44

The high impacts on performances coming from ecosystem inputs received results in a value generated of 17, that subtracting the restrained costs they bear for value added services, brings to a marginal Value capture of 5. Once again, the fluidity and ease of relationship present in the San Francisco bay allows a participant to leverage the network, increasing its performances strategically.

Co-working Spaces

Co-Working is a business services provision model that involves individual entrepreneurs working independently or collaboratively in shared office spaces. They offer 24/7 access to work spaces and basic business services such as Wi-Fi connection, communal printer/copier/fax, reservable conference rooms and shared kitchens and lounges usually in exchange of a monthly or weekly flat fee. San Francisco co-Working explosion (46 Co-Wo spaces mapped), bring them to serve the majority of entrepreneurs becoming a networking center. They, in fact, are meeting points in which people share knowledge and previous experiences helping young talents to enter in contact with investors or exploit Incubators programs with the aim of gaining social credit and take advantage of the ecosystem opportunities, as showed in figures and tables below.

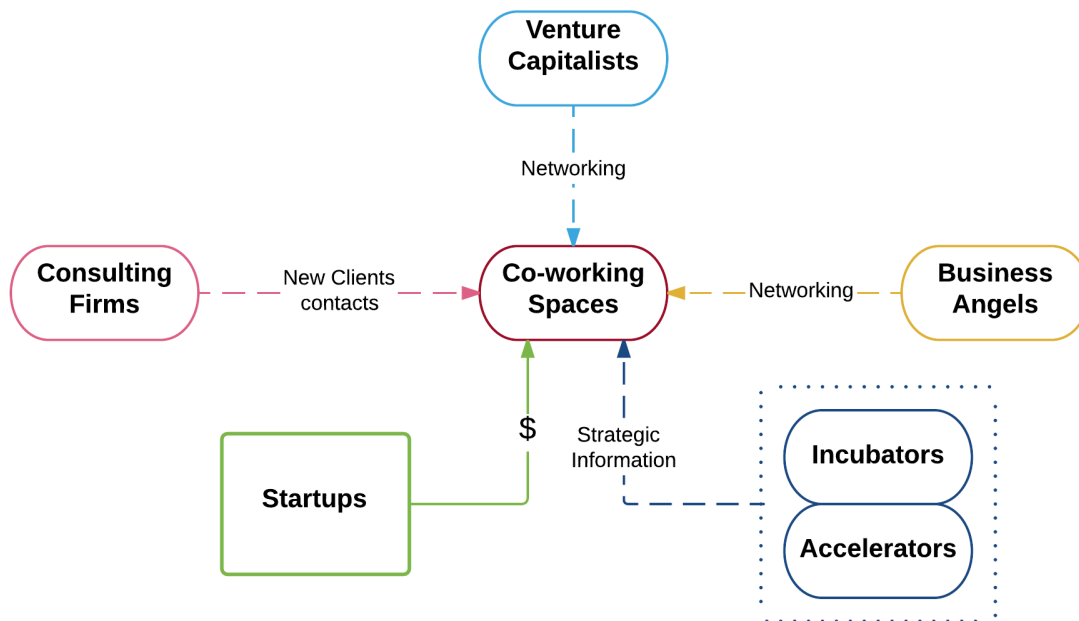


Fig.4.28: Co-Working spaces Inflows
Source: Personal Elaboration

Input	From	Description	Tang. / Intang.	Impact
Networking	Venture Capitalists	Informal meeting and events to share experiences and new startups trends	I	1,89
Networking	Business Angels		I	2,53
Strategic Information	Incubators/ Accelerators	Hints on mentored startups and strategic clients proposal	I	1,36
Money	Startups	Payment for shared infrastructures	T	3,59
New Clients Contacts	Consulting Firms	Information on supported clients: their needs and their behaviors	I	1,75
				11,12

Impact: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.20: Co-Working Spaces ecosystem Impacts Table

Source: Personal Elaboration

The analysis of Co-working spaces inflows, gathered from the above figure and table, highlights the typical intangible nature of the network returning four intangible ties and a tangible one. However, the monetary input has a high impact on performances being the outcome of the core activity of the business, namely the provision of shared infrastructures and basic services. Secondary, noteworthy is the information network present, that allows a continuous exchange of thoughts among investors, incubators, consulting firms and the analyzed actor that give rise to several insights on entrepreneurship past experiences and knowledge and hints on new innovation trends. This intertwined network permits to reach an incredible customer base, increasing Silicon Valley Co-Working spaces performances.

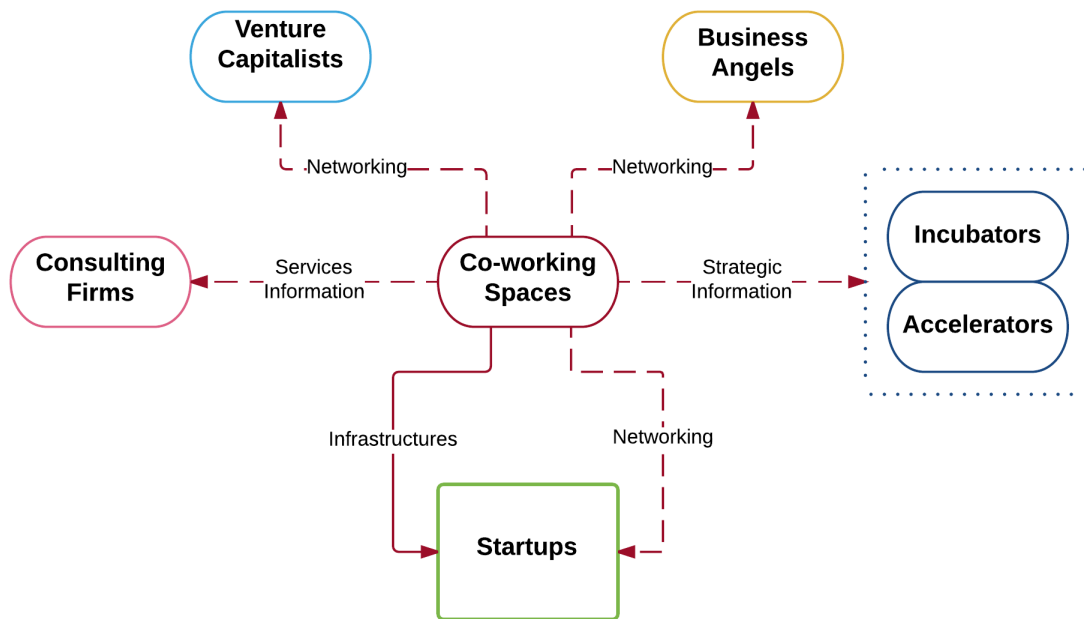


Fig.4.29: Co-Working Spaces Outflows
Source: Personal Elaboration

Output	To	Definition	Tang. / Intang.	Value Added Cost
Networking	Business Angels	Information on startup trends and volumes	I	1,32
Strategic Information	Incubators/ Accelerators	Information on startups' needs and possible strategic collaborations	I	1,75
Networking	Startups	Community, introduction in the network, events guidance	I	1,75
Infrastruc.	Startups	Shared office rooms with principal related services	T	3,15
Services Information	Consulting Firms	Own business structure proposal: service offered and networking opportunities	I	1,13
Networking	Venture Capitalists	Information on startup trends and volumes	I	1,70
				10,80

VA cost: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.21: Co-Working Spaces Value Added Costs Table
Source: Personal Elaboration

Co-working spaces exchange outflows get involved numerous institutions among the San Francisco bay ecosystem. First of all, they nurture strategic collaborations with investors in order to propose an introduction outlet to their clients; then they share strategic information with incubators and consulting firms with the aim of understanding entrepreneurs needs

and to work on possible service cooperations. Finally, their core relationship with entrepreneurs bring them to offer both a tangible and an intangible link; while the first one costs them a lot, due to the high costs of San Francisco real estate, the second one, based on event guidance and community introduction is favored by their previous illustrated relationships.

Co-Working Value Generated	11,12
Co-Working Value Added Cost	10,80
Co-Working Value Capture	0,32

The limited Value Capture indicates that, although they are strategically performing sufficiently well thanks to their positioning in the network, their costs are slightly high due to the expensive tangible output that, being their core activity, is prevalent on the others. However, it is not directly attributable to Co-Working spaces strategy, but it derives from the immigration boom affecting the Bay.

Consulting Firms

Consulting world is constantly shifting its focus to follow the clients' needs; the innovation driven Entrepreneurship boom bring them to modify their proposals looking at small businesses and Startups. In San Francisco, driven by the market, many small consulting firms offering legal, business and technical advisory arose. They are based on attorneys, marketers and tech experts providing professional advice on entrepreneurial ecosystem dynamics.

Differently from Incubators/Accelerators programs, they offer private end-to-end services with tailored solutions for each clients.

Their experience allows them to have contacts with the most proficient Investors and Institutions of the “Valley”, giving them the possibility to introduce their clients to a solid network structure.

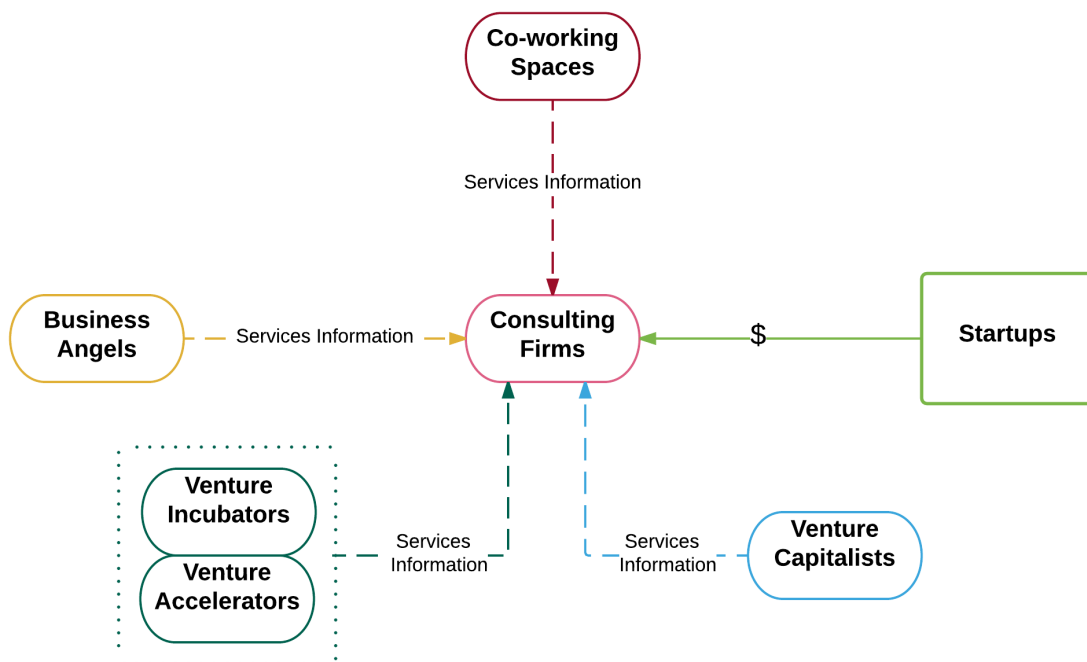


Fig.4.30: Consulting Firms Inflows
Source: Personal Elaboration

Input	From	Description	Tang. / Intang.	Impact
Services Information	Co-Working Spaces	Own business structure proposal: service offered and networking opportunities	I	1,69
Money	Startups	Payment for legal & business services	T	3,14
Services Information	Venture Capitalists	Hints on investment procedures in order to create possible collaborations	I	2,40
Services Information	Venture Incub./Acc.	Information on investment procedures and mentorship programs held	I	1,93
Services Information	Business Angels	Hints on investment procedures in order to create possible collaborations	I	3,00
				12,16

Impact: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.22: Consulting Firms ecosystem Impacts Table
Source: Personal Elaboration

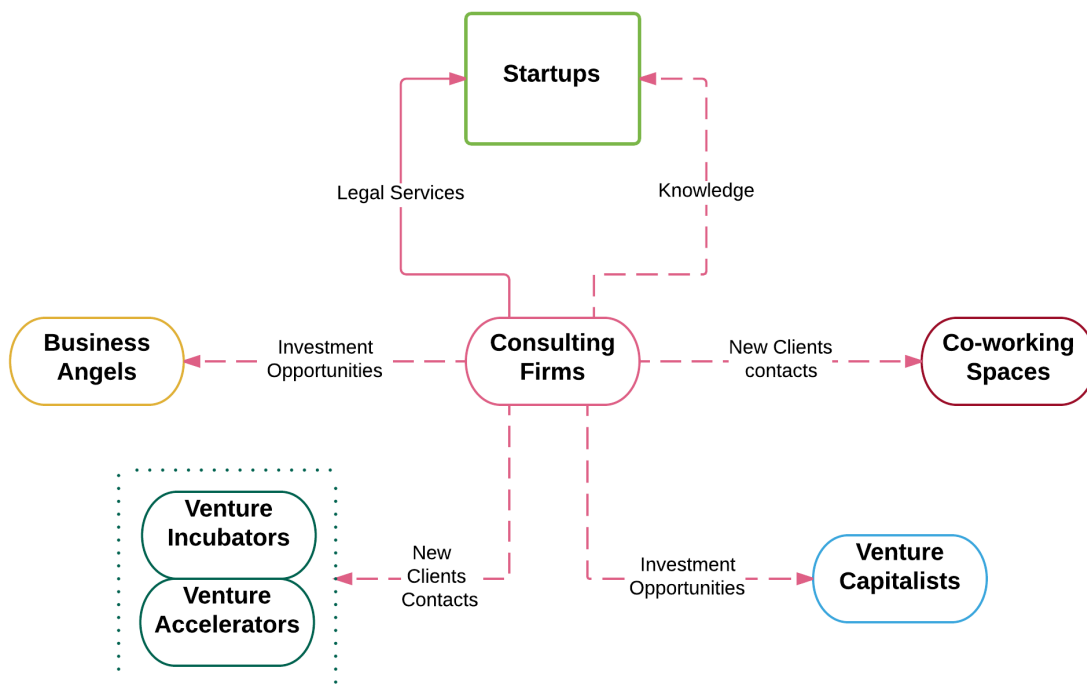


Fig.4.31: Consulting Firms Outflows
Source: Personal Elaboration

Output	To	Definition	Tang. / Intang.	Value Added Costs
Legal Services	Startups	Any legal and business support from the company establishment to fund raising and equity agreements	T	3,20
Knowledge	Startups	Hints on principal processes such as technical or marketing partnerships with other actors	I	1,60
New Clients Contacts	Co-Working Spaces	Information on supported clients: their needs and their behaviors	I	1,21
Investments Opportun.	Venture Capitalists	Information on new clients opportunities and backgrounds	I	1,21
New Clients Contacts	Venture Incub./Acc.	Information on supported clients: their needs and their behaviors	I	1,69
Investment Opportun.	Business Angels	Information on new clients opportunities and backgrounds	I	1,60
				10,51

VA cost: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.23: Consulting Firms Value Added Costs Table
Source: Personal Elaboration

A further analysis on Consulting Firms inflows and outflows shows their ample combination with the other ecosystem's participants and especially with Startups. They, in fact, offer business, legal and tech advisory coupled with an intangible series of hints on the network dynamics in exchange of a flat monetary fee. Secondary, following the ecosystem trend, they nurture a set of relationships resulting key for their performance success with other actors spanning from investors to Co-Wo spaces and incubators.

Consulting Value Generated	12,16
Consulting Value Added Cost	10,51
Consulting Value Capture	1,65

Consulting firms' success is increasing year by year since they shaped their services to help small and innovative businesses. This trend is directly visible through their value capture, that underlines the performance benefits they are receiving from the ecosystem.

Venture Incubators / Venture Accelerators

Venture Incubators and Accelerators have a similar structure compared to classic Incubators/Accelerators with the only difference that they provide access to early capital that entrepreneurs need, through seed investments. Incubators/Accelerators investments, coupled with Business Angels, are altering the dynamics of the venture market, picking up speed accelerating any entrepreneurial process. This approach helps the network bringing startups to success/failure rapidly and ensuring early replacements crucial for the ecosystem health. In the San Francisco bay area, they are well developed and their success is increasing due to their complete offering and their help in ensuring a smooth transition when VCs come on scene, planning later stage investments for their clients with them thanks to the cooperative nature of the ecosystem.

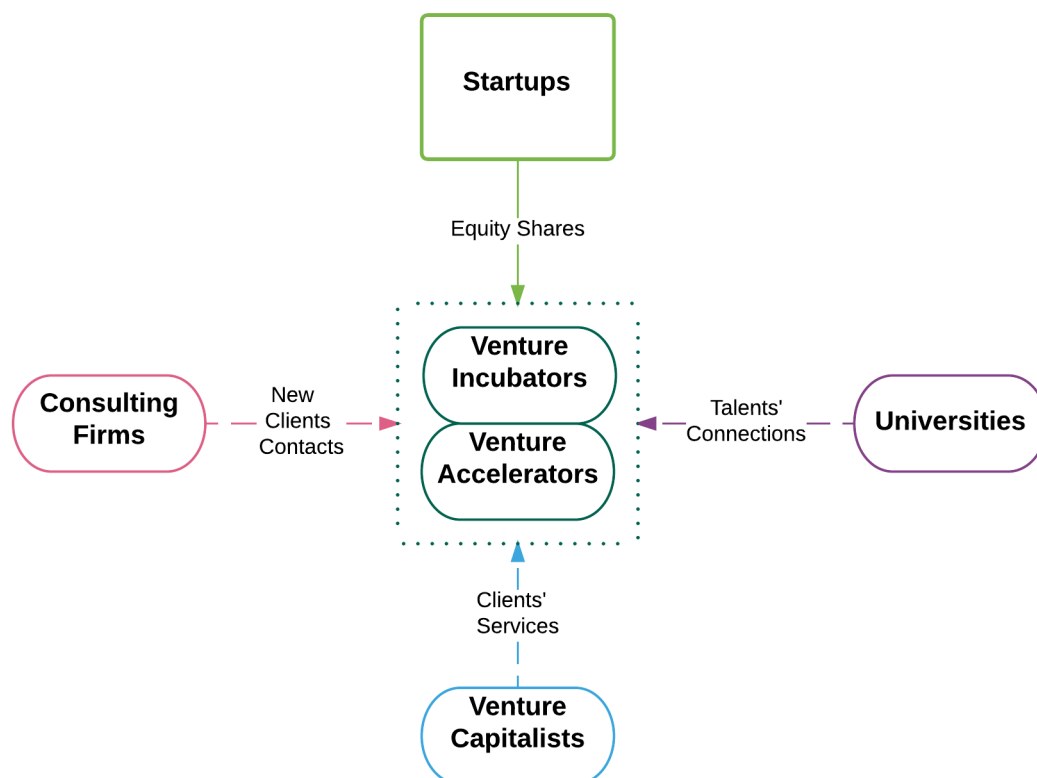


Fig.4.32: Venture Incubators/Accelerators Inflows

Source: Personal Elaboration

Input	From	Description	Tang. / Intang.	Impact
Equity Shares	Startups	Startup shares exchanged for monetary investments	T	4,43
Talents' Connections	Universities	Possibility to enter in contact with talented students through events and pitch contests	I	3,58
Clients' Services	Venture Capitalists	Investments' trends and clients mentorship collaborations	I	3,46
New Clients Contacts	Consulting Firms	Information on supported clients: their needs and their behaviors	I	2,56
				14,03

Impact: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.24: Venture Incubators/Accelerators ecosystem Impacts Table
Source: Personal Elaboration

The hybrid nature of Venture Incubators and Venture Accelerators bring them to cover more positions and roles among the ecosystem limiting slightly their network dimension. In fact, they only have four connections as inputs that, nevertheless, have really high impacts on their performances singularly. The tangible input they receive from Startups, in the form of equity shares, as a compensation for their services; characterize the highest impact on their performances since it constitutes a high potential asset if the invested clients succeed. The second highest impact is represented by the connection enhanced by Silicon Valley academies, from which Venture Incub./Acc. extract valuable relationships with talents potentially interested in their services. Finally, they receive beneficial information from their connections with investors and consulting firms enhanced by their networking ability. Information on investing trends and entrepreneurs' behaviors, coming from different actors among the Valley, help them to modify their training programs adapting them to the entrepreneurs' needs.

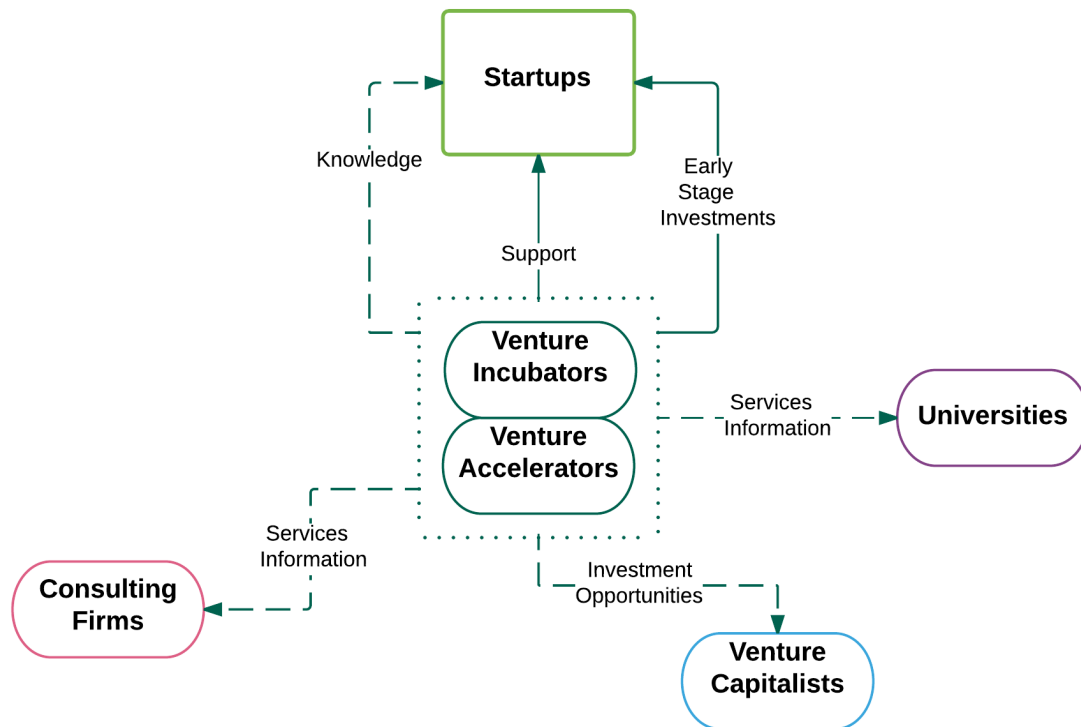


Fig.4.33: Venture Incubators/Accelerators Outflows
Source: Personal Elaboration

Output	To	Definition	Tang. / Intang.	Value Added Cost
Knowledge	Startups	Hints on network dynamics, past success stories sharing, community	I	1,81
Support	Startups	Mentorship training programs (technical, marketing)	T	2,82
Early Stage Inv.	Startups	Small investments to support mentored startups in their early phases	T	2,13
Services Information	Universities	Hints on investments procedures and mentorship plans	I	1,11
Investment Opportun.	Venture Capitalists	Possibility to collaborate for later stage investments	I	2,13
Services Information	Consulting Firms	Information on investment procedures and mentorship programs held	I	1,66
				11,66

VA cost: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.25: Venture Incubators/Accelerators Value Added Costs Table
Source: Personal Elaboration

The table above analyzes the outflow generated by Venture Incubators / Accelerators, focusing on the costs they bear for adding value to the ecosystem. Half of the exchanges they make involve startups due to the fact that their core activity is to generate services to help them. Outflows to Startups are both tangible, represented by small investments to support the basic expenses their clients have in early stages and typical mentorship programs, both intangible in the form of knowledge sharing based on their experience on field. The investments, that differentiate them from normal Incubators/Accelerators, represent the highest cost they have but, on the other hand, are crucial for the success of their clients, directly correlated to their own business performances. Other than those, the analyzed actor exchange strategic information with other later investors in order to coordinate their investment plans taking advantage of the collaborating mindset that allows them to relate themselves on an informal basis; and carry out the information sharing activities typical of the San Francisco bay ecosystem, such as participating to panels and university events, and disseminate freely their knowledge.

Venture Incub./Acc. Value Generated	14,03
Venture Incub./Acc. Value Added Cost	11,66
Value Capture	2,37

The result is, once again, a positive outcome related to Value capture that reinforce their strategic choices giving them clues to persist with the collaborative approach that allows the Silicon Valley ecosystem to stand out.

Banks

The relationship between banks and entrepreneurship is difficult and fragile, due to the fact that small innovative businesses need investments more than debits. However, in the Silicon Valley, banks have been at the epicenter of the ecosystem since the beginning, supporting startups in the earliest days through competitively priced financial products and services and a provision of finance, operations, and accounting tool at a reduced rate. The entrepreneurship driven market brings many established financial institutions to plumb into the network focusing on young talented entrepreneurs and developing an advisory approach to help them strive. Moreover, the trustful mindset governing the network allows structured institutions like them to collaborate with other investors sharing information and co-investments opportunities with the aim of exploiting the network even if not completely suitable for them. The figures and tables below highlights their efforts, underlining the fact that their adaptation has not been already completed.

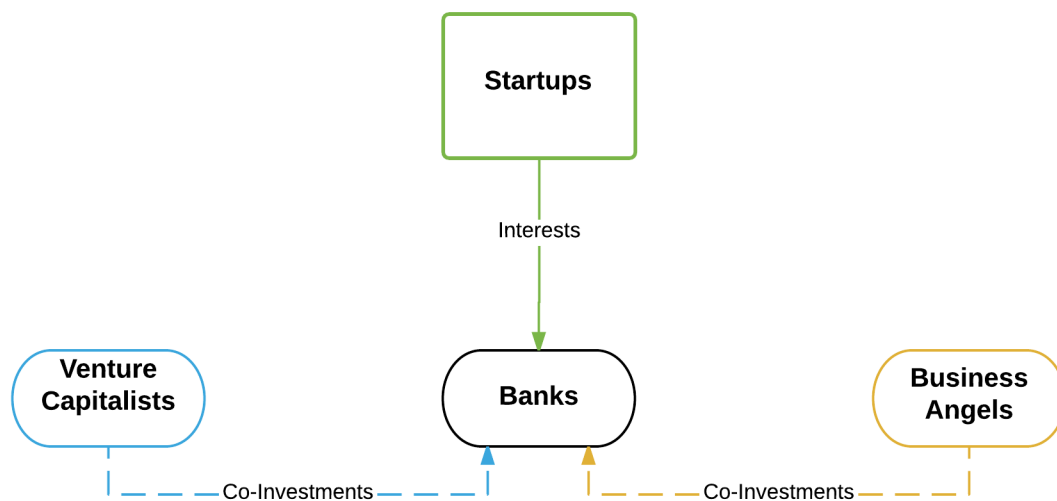


Fig.4.34: Banks Inflows
Source: Personal Elaboration

Input	From	Description	Tang. / Intang.	Impact
Interests	Startups	Interests payment	T	3,00
Co-Investments	Business Angels	Sharing of information and investments strategies to collaborate, share risks and help their backed startups to succeed	I	1,93
Co-Investments	Venture Capitalists	Sharing of information and investments strategies to collaborate, share risks and help their backed startups to succeed	I	3,00
				7,93

Impact: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.26: Banks ecosystem Impacts Table
Source: Personal Elaboration

The struggles characterizing the scarce flexibility of financial institutions like banks are well represented in the table above. Although, their commendable efforts, their engagement in the network is still limited and focused only on the financial outputs of the ecosystem. Banks are, in fact, involved only in relationships with startups and investors, trying to extract the highest amount of benefits from a moderate network. The highest impact on their performances is represented by the monetary interest paid by innovative Startups in exchange of risky early stage loans. Noteworthy are also the collaborative exchanges of strategic information occurring among other proficient investing actors and them. The immense entrepreneurial market of the Silicon Valley, made of innovative small businesses, bring banks to focus on it, changing their organizational structure to be able to collaborate with others benefiting of the valuable exchanges incurring among the network.

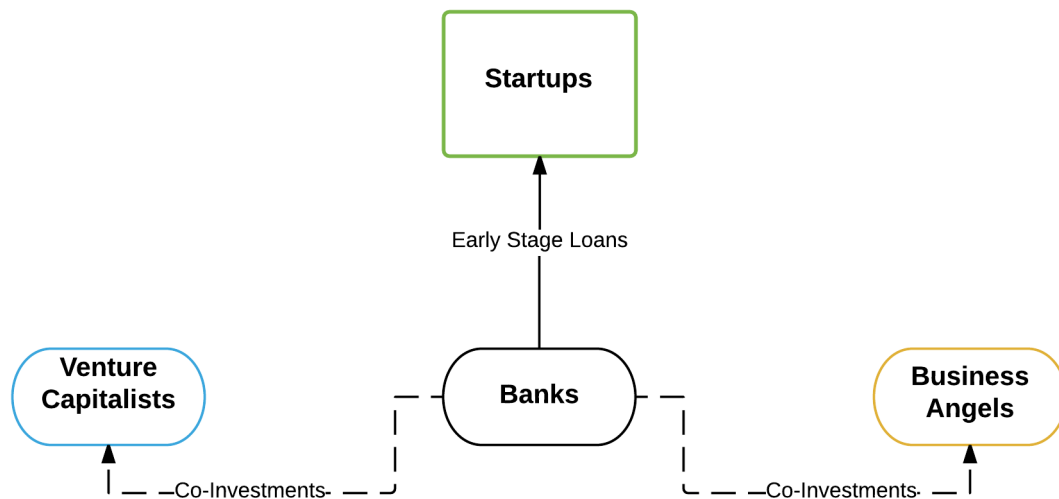


Fig.4.35: Banks Outflows
Source: Personal Elaboration

Output	To	Definition	Tang. / Intang.	Value Added Cost
Early Stage Loans	Startups	Risky loans at affordable interest returns	T	2,40
Co-Investments	Business Angels	Sharing of information and investments strategies to collaborate, share risks and help their backed startups to succeed	I	1,60
Co-Investments	Venture Capitalists	Sharing of information and investments strategies to collaborate, share risks and help their backed startups to succeed	I	0,96
				4,96

VA cost: 1=Very Low 2=Low 3=medium 4=High 5=Very High (see appendix 7.1 for calculations)

Tab.4.27: Banks Value Added Costs Table
Source: Personal Elaboration

A focus on the value added costs, highlights the limited width of the banks’ network, that brings them to have as outflows only 3 exchanges. Respectively, with Startups, as their core activity, and with Business Angels and Venture Capitalists to maintain the cooperative relationship based on information sharing.

Banks Value Generated	7,93
Banks Value Added Cost	4,96
Banks Value Capture	2,97

The calculation of the marginal value among value generated and value added cost returns a Value Capture of 3. The positive value brings to the conclusion that, even if banks are not completely embedded in the network, their efforts to become flexible and provide additional services to entrepreneurs, such as dedicated experienced financial managers, and the collaborative and loyal behaviors they are adopting with other investors, coupled with the recurring features of the Silicon Valley ecosystem, allows banks to be a positive participant inside the network. However, their financial-centered focus is risky and strictly related to entrepreneurs' financial exits and success, making them a more unstable ecosystem participant.

Participant	Value Capture
Startups	23,28
Venture Capitalists	6,21
Business Angels	3,83
Universities	-0,90
Incubators/Accelerators	2,44
Co-Working Spaces	0,32
Consulting Firms	1,65
Venture Incubators/Accelerators	1,24
Banks	2,97

Tab.4.28 Participant-level Value Capture Table

Source: Personal Elaboration

The above table summarizes the results coming from the company-level Strategic Value analysis, highlighting the outstanding strategic performances of each actor among the ecosystem.

After a detailed analysis on each actors' performances and marginal Value capture, in the following paragraph, the empirical research model proposes a holistic evaluation of the San Francisco bay ecosystem, with the aim of assessing its throughout performances.

Ecosystem Value Capture Analysis

The ecosystem-level analysis is made through the sum of the computations of each singular exchange value capture, giving insights of each exchange strategic performance.

The table below summarizes the results:

Exchange	To	T/I	Impact	Value Added Cost	(Impact – Value Added Cost) = Value Capture
FROM Venture Incubators / accelerators					
<i>Knowledge</i>	Startups	I	2,65	1,81	0,84
<i>Support</i>	Startups	T	5,00	2,82	2,18
<i>Early Stage Inv.</i>	Startups	T	2,41	2,13	0,28
<i>Services Info</i>	Universities	I	1,69	1,11	0,58
<i>Investment opportunities</i>	Venture Capitalists	I	2,41	2,13	0,28
<i>Services Info</i>	Consulting Firms	I	1,93	1,66	0,27
FROM Venture Capitalists					
<i>Knowledge</i>	Startups	I	1,69	0,96	0,73
<i>Later Stage Inv.</i>	Startups	T	3,20	3,15	0,05
<i>Events Sponsor</i>	Universities	T	2,78	1,82	0,96
<i>Co-Investments</i>	Business Angels	I	3,00	2,66	0,34
<i>Information</i>	Incubators/ Accelerators	I	2,40	1,05	1,35
<i>Networking</i>	Co-Working Spaces	I	1,89	1,37	0,52
<i>Services Info</i>	Consulting Firms	I	2,40	1,21	1,19
<i>Co-Investments</i>	Banks	I	3,00	2,66	0,34
<i>Clients' Services</i>	Venture Incub./Acc.	I	3,46	1,69	1,77
FROM Universities					
<i>Spinoffs</i>	Startups	I	2,40	1,82	0,58
<i>Talents' Connections</i>	Incubators/ Accelerators	I	3,20	1,21	1,99
<i>Talents' Connections</i>	Business Angels	I	3,20	1,93	1,27
<i>Talents' Connections</i>	Venture Capitalists	I	1,54	2,65	-1,11
<i>Talents' Connections</i>	Venture Incub./Acc.	I	3,58	1,60	1,98
FROM Startups					
<i>Money</i>	Consulting Firms	T	3,14	1,21	1,93
<i>Money</i>	Co-Working Spaces	T	3,59	1,93	1,66
<i>Money</i>	Incubators/ Accelerators	T	3,38	2,40	0,98
<i>Equity Shares</i>	Business Angels	T	4,00	4,00	0,00
<i>Equity Shares</i>	Venture Capitalists	T	3,38	4,00	-0,62
<i>Equity Shares</i>	Venture Incub./Acc.	T	4,43	2,40	2,03
<i>Interests</i>	Banks	T	3,00	1,69	1,31

Exchange	To	T/I	Impact	Value Added Cost	(Impact – Value Added Cost) = Value Capture
FROM Incubators / Accelerators					
<i>Strategic Information</i>	Co-Working Spaces	I	1,36	2,00	-0,64
<i>Information</i>	Venture Capitalists	I	2,38	1,21	1,17
<i>Information</i>	Business Angels	I	2,65	1,21	1,44
<i>Services Information</i>	Universities	I	1,69	1,00	0,69
<i>Knowledge</i>	Startups	I	3,00	1,60	1,40
<i>Support</i>	Startups	T	3,14	3,14	0,00
FROM Co-Working Spaces					
<i>Networking</i>	Business Angels	I	3,00	1,32	1,68
<i>Strategic Information</i>	Incubators/ Accelerators	I	1,21	1,75	-0,54
<i>Networking</i>	Startups	I	2,40	1,75	0,65
<i>Infrastructures</i>	Startups	T	3,20	3,15	0,05
<i>Services Information</i>	Consulting Firms	I	1,69	1,13	0,56
<i>Networking</i>	Venture Capitalists	I	0,96	1,70	-0,74
FROM Consulting Firms					
<i>Legal Services</i>	Startups	T	3,20	3,20	0,00
<i>Knowledge</i>	Startups	I	1,69	1,60	0,09
<i>New Clients contacts</i>	Co-Working Spaces	I	1,75	1,21	0,54
<i>Investment Opportunities</i>	Venture Capitalists	I	2,41	1,21	1,20
<i>New Clients Contacts</i>	Venture Incub./Acc.	I	2,56	1,69	0,87
<i>Investment Opportunities</i>	Business Angels	I	1,69	1,60	0,09
FROM Business Angels					
<i>Early Stage Investments</i>	Startups	T	5,00	5,00	0,00
<i>Information</i>	Incubators/ Accelerators	I	2,41	1,60	0,81
<i>Networking</i>	Co-Working Spaces	I	2,53	1,69	0,84
<i>Services Information</i>	Consulting Firms	I	3,00	0,96	2,04
<i>Co-Investments</i>	Banks	I	1,93	1,93	0,00
<i>Co-Investments</i>	Venture Capitalists	I	2,96	1,93	1,03
<i>Events</i>	Universities	T	2,15	3,00	-0,85
FROM Banks					
<i>Early Stage Loans</i>	Startups	T	1,93	2,40	-0,47
<i>Co-Investments</i>	Business Angels	I	2,40	1,60	0,8
<i>Co-Investments</i>	Venture Capitalists	I	2,65	0,96	1,69
					38,08

Tab.4.29: Ecosystem Value Capture table
Source: Personal Elaboration

The San Francisco Bay entrepreneurial ecosystem Value Capture is 38,08.

The inimitable network conditions, that characterize the ecosystem, bring to a high positive value, as a result of the positivity of almost the totality of the exchanges. The ecosystem Value Capture result is essential for the overall strategic performance assessment of the ecosystem; a positive value indicates a healthy environment and the single exchanges

evaluations give several insights on the specific performances as an outcome. Interesting is the positive result of almost every exchange at firm-level that reflects on the consequent high positive holistic result; this evidence could be a measure of “value sustainability” of the ecosystem and, more in general, of the networks.

Even if 7 linkages have a negative value capture, the analysis cannot precisely say if their exclusion will be beneficial or not for the entire ecosystem, since a correlation analysis must be implemented to determine that.

The merely numerical value of 38,08 does not give, alone, an idea of high or low absolute value; a future analysis on other entrepreneurial ecosystems will result in a proper benchmark evaluation base. However, this value, associated with the top performing ecosystem in all the practitioners’ rankings, will definitely stand among the highest results. This overall strategic performance analysis, numerically calculated in terms of tangible and intangible value creation with an innovative empirical model, for the first time analyzes in depth the exchanges network, giving detailed insights on the strategic ecosystem dynamics, and constitute a powerful tool available for future research implementations.

CHAPTER 5 - DISCUSSIONS AND CONCLUSIONS

The scope of this final chapter is to provide final remarks on this thesis work. The results of the research will be discussed, taking into consideration both the values for the research both the values for practitioners and pointing out limitations and possible future development.

The main contribute of the research work proposed, is to give a detailed strategic analysis of the entrepreneurial ecosystem, arising from the literature on Strategic and Value networks; through the development of a practical tool that evaluates tangible and intangible value flows among participants.

The principal steps, and the main objectives and advantages related to each step, are summarized in the table below:

Phase	Step	Definition & Objectives/Advantages
Strategic Value Map	Exchange Map	<i>Overview of the exchange patterns of the ecosystem as a first impact on the network structure</i>
	Ties Map	<i>Graphical representation of the linkages among participants' groups in order to assess the relationship patterns</i>
Network Analysis	Ties & Exchanges Table	<i>Summary of the social behaviors and the nature of ties, useful for groups comparisons</i>
	Structural Holes Map	<i>Representation of the linkages interruptions, aiming at assessing the freedom of value flow</i>
	Structural Equivalences Map	<i>Map grouping participants holding similar positions, in order to assess the numerical width of the network and the consequent competition degree</i>
	Outcomes Analysis	<i>Definition of the main network structure features (open vs closed systems/ network focal) giving several strategic insights</i>
	Input/Output Map	<i>Graphical map representing the value inflows/outflows in order to better understand each specific exchange pattern and enhance an isolated analysis</i>
Strategic Value Analysis	Input/Output Analysis	<i>Exchange structure definition and numerical evaluations based on a qualitative 5-points Likert scale, with the aim of assessing the Value generated by the surrounding ecosystem and the cost of adding value to it.</i>
	Value Capture Analysis (firm-level)	<i>Calculation of the marginal value between inflows and outflows of each participant, resulting in the assessment of their strategic performances as part of the ecosystem</i>
	Value Capture analysis (ecosystem-level)	<i>Calculation of each exchange Value Capture marginal value giving several insights on each exchange health, and on the resulting ecosystem sustainability performances</i>

*Tab.4.30: Strategic Value Analysis summary table
Source: Personal Elaboration*

Each of the steps analyzed above bring a valuable contribution to the model, with the aim of developing the most comprehensive empirical model, giving an accurate strategic examination of entrepreneurial networks.

5.1 VALUE FOR RESEARCH

The purpose of this academic research work has been the strategic evaluation of the entrepreneurial ecosystem, representing its dynamics and its exchanges in detail. The empirical outcome has been built with a strong academic literature analysis that justifies the passages followed and the decision undertaken.

In this paragraph, the main academic findings valuable for the Research are shown:

- I. Two parallel theories, Strategic Network and Value Network, never integrated before, are combined into an innovative theory named as Strategic Value Network
- II. The innovative theory developed, maps efficiently and holistically entrepreneurial ecosystems in which tangible and intangible values are relevant, giving a contribute of strategic analysis of the entrepreneurial ecosystem.

The academic literature analysis made, had the objective of defining strategically entrepreneurial networks and evaluating the performances related to it as an outcome. The first consideration that must be done is that the prominent literature available on the field, resulted not systematically concentrated on relevant strategic aspects and, the Strategic stream appeared partially fragmented and did not fully integrate new concepts as Value Network and Business Model. In order to fill this literature gaps, the research critically analyzed separately the Strategic Network and the Value Network streams, highlighting their features and presenting their respective pitfalls. On one hand, strategic network theory clearly defines the structure of the network and the dynamics leading to different strategic choices but lacks in a systematic discussion of the link between strategic choices and the value generation that brings to the definition of Network performances. On the other hand, value network theory gives a practical tool to assess tangible and intangible exchanges lacking in a clear strategic implementation on an ecosystem level.

The research work combines the two parallel theories developing a powerful tool able to evaluate the network exchanges, giving a distinct connection to the ecosystem performances.

The combination of the two theories was, then, implemented to ecosystems in which both tangible and intangible values are considered relevant, such as entrepreneurial ecosystems or any high innovative network. The analysis allows to map efficiently ecosystems in terms of Value Generation and Value Capture performances.

The specific empirical implementation of the developed evaluation model, on the San Francisco bay area entrepreneurial ecosystem, brings to some interesting findings:

- *Trust*: the concept of trust is the principal reason of the “Silicon Valley” ecosystem outstanding performances. A trustful mindset lowers relationship costs allowing the stipulation of informal contracts among firms. Informal contracts are characterized by low bureaucratic costs and times, encouraging the generation of interconnected networks made of intertwined efficient relationships. Innovative entrepreneurial ecosystems, characterized by rapidly changing environments and flexible structures, necessitate of a strong intangible network, made of information flows and knowledge sharing, that can be fully exploited only with a trustful mindset background. Moreover, trustful environment nurtures self-generating informal rules, in which opportunistic behaviors are automatically punished with the alienation of the guilty party. Trust, therefore, allows a general increase of ecosystem performances affecting each single exchange and each structural feature; and, lastly, establishing a meritocratic and pleasant work environment.
- *Collaboration*: strictly related with the concept of trust, collaboration is an important feature of the ecosystem of San Francisco bay. Collaborative behaviors allow network participants to share strategic information and experiences knowledge among them allowing the generation of a solid network that helps its actors to take the right decision at the right time in such a complex and unstable business market. The density of the Silicon Valley network nurtures a willingness to help the neighbor that is called by insiders “Social credit”; it represents the mindset for which everyone, even CEOs of the most proficient companies in the area, carve out time to mentor and advise anyone who needs help. The dense and high quality environment, in fact, provides innumerable sources of help, and if someone rejects you, another expert will give you his/her time gaining social credit that will be rewarded in the future. Business collaborations are present all along the

network and allow to share ideas and risks increasing performances at company and ecosystem-level.

- *Structural Holes*: theory on structural holes, disclosed by the academician Burt (Burt, 1992), resulted unsuitable for the entrepreneurial ecosystem analyzed, based on trust and collaboration. The efficiency of the ecosystem is, in fact, driven by the low costs of transaction, and not by the correct selection of information. Redundant information are not considered a problem and, on contrary, guarantee the availability of high quality information also through indirect ties, making structural holes absolutely not necessary and the already existing ones not problematic.
- *Structural Equivalences*: academic literature on strategic networks considers structural equivalences problematic for networks due to the resulting increase of competition and duplication of services. The empirically analyzed ecosystem, however, mitigates this negative aspect thanks to an extremely collaborative approach that bring any similar participant to cooperate sharing information and risks, transforming a possible pitfall in an opportunity.
- *Network Focal*: the research made, through case studies analyses, on the ecosystem object of study, results in a negative consideration of network Focal in the meaning of a participant holding the source of power and to which everyone is linked. The Silicon Valley ecosystem, being highly interconnected, represents a case in which the network is developed horizontally and where every participant is related with almost all the other actors. This configuration allows a strong collaboration among participants, that are situated on the same level. The introduction of a focal will modify the balance generating competitive conducts, that could result in an increase in transaction costs and opportunistic behaviors, lowering the performances of the network.

5.2 VALUE FOR PRACTITIONERS

The empirical application of the research work, in the form of a detailed analysis of each group of actors present in the San Francisco bay area, give rise to some findings useful for managers, practitioners and policy makers, implementable as possible operative guidelines:

- *Startups*: the Value Strategy analysis, underlines the importance of a rich surrounding environment for the startup sustenance. Entrepreneurs ability of networking is fundamental especially in early stages where the resource-scarce phase does not allow them to gather all the information and competence needed alone. The participation to mentorship training programs resulted to be extremely valuable and allow them to approach the community in which they operate, with the aim of participating to pitch events where to raise critical investments.
- *Investors*: the most important finding concerning investment firms is related to collaboration; sharing investments programs and information on the market with other investors allow them to broaden their vision on the ecosystem and share risks, with the aim of enlarging their portfolio and, consequently raising their probability of success. Opportunistic behaviors, with the generation of exclusive contracts, will only result in failures both on their side, because of the reduced portfolio, both on their clients' side, that could lose their decision-making power. Especially in conditions of investors' density, characterized by a structural equivalence among them, maintaining a strategically active intangible network is fundamental.
- *Universities*: the company-level analysis made earlier, gives rise to interesting findings related to universities performances. The evaluation outcome equal to zero brings to a deeper consideration of their strategic mission. Universities embedment into the ecosystem is strictly related to the task of nourishing the network through the education of young talents that will be the next entrepreneurs. This approach brings to a contribution strictly related to their sustainability, without any necessity of gaining an extra-value from the ecosystem.

5.3 LIMITATIONS

The restricted period of time and the scarcity of resources bring to some criticalities among the research work proposed:

- First of all, the empirical model proposed has been applied only to the San Francisco bay area ecosystem. The lack of a comparison with other entrepreneurial ecosystems around the world could undermine the principal findings gathered;
- Secondary, the model is theoretically suitable for any ecosystem in which intangible exchanges are relevant as tangible ones. However, the analysis has been implemented only to entrepreneurial ecosystems;
- The limited amount of case studies analyzed, during the permanence at Stanford as participant observer, favoring the quality and profoundness of the case studies faced, could result in a partial distortion of the ecosystem extremes;
- The interview technique, adopted for the case studies, could be subjected to observers' bias. Even if, the semi-structured approach adopted mitigates it, there could still be an intrinsic misrepresentation.

5.4 FUTURE RESEARCHES

This paragraph proposes a set of future developments that could interest future academic researches:

- Interesting could be the extension of the research work to other entrepreneurial ecosystems with the aim of studying the dynamics and the exchanges among them, comparing related results and performances;
- Future researches could implement the evaluation on other kind of ecosystems, similarly composed by tangible and intangible exchanges;
- Finally, a further focus on Silicon Valley, as the best practice in the field, with an enlargement of the sample analyzed and the embedment of other techniques could result in remarkable findings.

CHAPTER 6 - BIBLIOGRAPHY

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6.2 WEBSITES

www.mapyourstartup.co
www.sfstartupsmap.com
www.mappedinisrael.com
www.sanfrancisco.startups-list.com
www.tech.co
www.venturebeat.com
www.siliconvalleyindicators.org
www.startuppb.com
www.angel.co
www.startupblink.com
www.crunchbase.com
www.techcrunch.com
www.reddit.com
www.huffingtonpost.com
www.appfactorysf.com
www.hwvp.com
www.alsop-louie.com
www.bandangels.com
www.svb.com
www.500.co
www.alchemistaccelerator.com
www.matter.vc
www.harrisonmetal.com
www.rocketpace.com
www.galvanize.com
www.bendlawoffice.com
www.sequoiacap.com
www.luxe.com
www.plugandplaytechcenter.com
www.stanford.edu
www.startupcastle.com

www.wework.com

www.startupgenome.co

www.blog.startupcompass.co

www.oecd.org

www.kauffman.org

www.gsvlabs.com

www.cbinsights.com

www.meetup.com

www.startupembassy.com

www.startupdigest.com

www.startup.stanford.com

www.startx.com

CHAPTER 7 - APPENDIX

7.1 LIKERT SCALE WEIGHTED ON CONSENSUS: CALCULATIONS

Startups

Input	Likert scale Impact			Mean	Consensus	MLS*C
	App Factory 1	App Factory 2	Luxe Valet			
Legal Services	4	3	5	4,00	0,799	3,20
Knowledge	3	3	1	2,33	0,724	1,69
Infrastruct.	3	4	5	4,00	0,799	3,20
Networking	4	4	2	3,33	0,724	2,40
Support	4	4	5	4,33	0,724	3,14
Knowledge	3	3	3	3,00	1	3,00
Early Stage Inv.	5	5	5	5,00	1	5,00
Spinoffs	4	3	2	3,00	0,799	2,40
Later Stage Inv.	3	5	4	4,00	0,799	3,20
Knowledge	1	3	3	2,33	0,724	1,69
Early Stage Inv.	2	4	4	3,33	0,724	2,41
Support	5	5	5	5,00	1	5,00
Knowledge	4	3	4	3,67	0,724	2,65
Early stage loans	3	3	2	2,67	0,724	1,93
Output	Likert scale VA costs			Mean	Consensus	MLS*C
Money	2	2	1	1,67	0,724	1,21
Money	3	3	2	2,67	0,724	1,93
Money	3	3	4	3,33	0,724	2,4
Equity Share	4	4	4	4,00	1	4,00
Equity Share	4	4	4	4,00	1	4,00
Equity Share	4	2	3	3,00	0,799	2,40
Interests	1	3	3	2,33	0,724	1,69

Venture Capitalists

Input	Likert scale Impact						Mean	Cons.	MLS *C
	HWVP 1	HWVP 2	Alsop Louie 1	Alsop Louie 2	Sequoia 1	Sequoia 2			
Equity Shares	4	5	5	5	4	5	4,67	0,724	3,38
Talents' Connections	1	2	1	3	2	2	1,83	0,840	1,54
Co-Investments	3	3	4	3	5	4	3,67	0,806	2,96
Information	2	3	3	2	4	3	2,83	0,840	2,38
Networking	2	1	2	1	1	1	1,33	0,724	0,96
Investment Opportunities	3	3	4	3	3	4	3,33	0,724	2,41
Co-Investments	3	5	3	5	3	3	3,67	0,724	2,65
Investment Opportunities	4	2	2	3	2	3	2,67	0,806	2,15
Output	Likert scale VA costs						Mean	Cons.	MLS *C
Knowledge	2	1	1	1	2	1	1,33	0,724	0,96
Later Stage Inv.	5	4	5	4	5	4	4,50	0,699	3,15
Events Sponsor	2	3	2	3	1	2	2,17	0,840	1,82
Co-Investments	3	2	4	4	3	3	3,17	0,840	2,66
Information	1	2	2	1	1	2	1,50	0,699	1,05
Networking	2	1	3	1	1	3	1,83	0,750	1,37
Services Information	2	2	1	2	1	2	1,67	0,724	1,21
Co-Investments	3	4	4	3	2	3	3,17	0,840	2,66
Clients' Services	2	3	2	3	2	2	2,33	0,724	1,69

Business Angels

Input	Likert scale Impact			Mean	Consensus	MLS*C
	B of A 1	B of A 2	B of A 3			
Equity Share	4	4	4	4,00	1	4,00
Information	3	4	4	3,67	0,724	2,65
Networking	3	3	3	3,00	1	3,00
Investment Opportunities	3	2	2	2,33	0,724	1,69
Co-Investments	4	3	2	3,00	0,799	2,40
Co-Investments	3	3	3	3,00	1	3,00
Talents Connection	4	5	3	4,00	0,799	3,20
Output	Likert scale VA costs			Mean	Consensus	MLS*C
Early Stage Inv.	5	5	5	5,00	1	5,00
Information	2	3	1	2,00	0,799	1,60
Networking	3	1	3	2,33	0,724	1,69
Services Information	2	1	1	1,33	0,724	0,96
Co-Investments	2	2	4	2,67	0,724	1,93
Co-Investments	3	3	2	2,67	0,724	1,93
Events Sponsor	3	3	3	3,00	1	3,00

Universities

Input	Likert scale Impact						Mean	Consensus	MLS*C
	Stanford 1	Stanford 2	Stanford 3	Stanford 4	Stanford 5	Stanford 6			
Services Info	2	2	3	2	2	3	2,33	0,724	1,69
Events Sponsor	4	2	3	3	2	2	2,67	0,806	2,15
Events Sponsor	4	3	3	3	3	5	3,50	0,796	2,78
Services Information	2	2	2	3	3	2	2,33	0,724	1,69
Output	Likert scale VA Costs						Mean	Consensus	MLS*C
Spinoffs	2	2	1	3	3	2	2,17	0,840	1,82
Talents' Connections	1	2	1	2	2	2	1,67	0,724	1,21
Talents' Connections	2	3	2	3	3	3	2,67	0,724	1,93
Talents' Connections	3	4	4	4	3	4	3,67	0,724	2,65
Talents' Connections	1	2	1	3	3	2	2,00	0,799	1,60

Incubators/Accelerators

Input	Likert scale Impact			Mean	Consensus	MLS*C
	Alchemist 1	Alchemist 2	Matter.			
Strategic Information	2	1	2	1,67	0,724	1,21
Information	2	4	3	3,00	0,799	2,40
Information	3	4	3	3,33	0,724	2,41
Talents' Connections	3	5	4	4,00	0,799	3,20
Money	5	5	4	4,67	0,724	3,38
Output	Likert scale VA costs			Mean	Consensus	MLS*C
Strategic Information	2	2	2	2,00	1	2,00
Information	1	3	1	1,67	0,724	1,21
Information	2	1	2	1,67	0,724	1,21
Services Information	1	1	1	1,00	1	1,00
Knowledge	2	1	3	2,00	0,799	1,60
Support	5	5	3	4,33	0,724	3,14

Co-Working Spaces

Input	Likert scale Impact				Mean	Consensus	MLS*C
	Startup Castle 1	Startup Castle 2	Rocket Space 1	Rocket Space 2			
Networking	4	2	2	2	2,5	0,756	1,89
Networking	3	2	4	4	3,25	0,777	2,53
Strategic Information	1	1	3	2	1,75	0,777	1,36
Money	5	5	4	5	4,75	0,756	3,59
New Clients Contacts	1	3	3	2	2,25	0,777	1,75
Output	Likert scale VA costs				Mean	Consensus	MLS*C
Networking	2	2	2	1	1,75	0,756	1,32
Strategic Information	3	3	2	1	2,25	0,777	1,75
Networking	3	2	1	3	2,25	0,777	1,75
Infrastruc.	4	5	4	5	4,5	0,699	3,15
Services Information	1	3	1	1	1,5	0,756	1,13
Networking	2	2	3	2	2,25	0,756	1,70

Consulting Firms

Input	Likert scale Impact			Mean	Consensus	MLS*C
	Bend Law 1	Bend Law 2	Bend Law 3			
Services Information	3	3	1	2,33	0,724	1,69
Money	4	5	4	4,33	0,724	3,14
Services Information	3	4	2	3,00	0,799	2,40
Services Information	2	3	3	2,67	0,724	1,93
Services Information	3	3	3	3,00	1	3,00
Output	Likert scale VA costs			Mean	Consensus	MLS*C
Legal Services	3	5	4	4,00	0,799	3,20
Knowledge	2	3	1	2,00	0,799	1,60
New Clients Contacts	1	2	2	1,67	0,724	1,21
Investments Opportun.	1	2	2	1,67	0,724	1,21
New Clients Contacts	3	2	2	2,33	0,724	1,69
Investment Opportun.	1	2	3	2,00	0,799	1,60

Venture Incubators/Accelerators

Input	Likert scale Impact					Mean	Consensus	MLS*C
	500Sup 1	500Sup 2	Plug&Play 1	P&P 2	P&P 3			
Equity Shares	5	5	5	5	4	4,8	0,922	4,43
Talents' Connections	3	5	5	4	5	4,4	0,814	3,58
Clients' Services	4	4	5	4	5	4,4	0,787	3,46
New Clients Contacts	3	4	3	4	3	3,4	0,752	2,56
Output	Likert scale VA costs					Mean	Consensus	MLS*C
Knowledge	1	3	3	2	2	2,2	0,823	1,81
Support	4	3	3	3	2	3	0,940	2,82
Early Stage Inv.	3	3	2	1	3	2,4	0,888	2,13
Services Information	1	1	1	1	2	1,2	0,922	1,11
Investment Opportun.	2	3	3	3	1	2,4	0,888	2,13
Services Information	2	2	2	2	1	1,8	0,922	1,66

Banks

Input	Likert scale Impact			Mean	Consensus	MLS*C
	SVB 1	SVB 2	SVB 3			
Interests	3	3	3	3,00	1	3,00
Co-Investments	3	2	3	2,67	0,724	1,93
Co-Investments	3	3	3	3,00	1	3,00
Output	Likert scale VA Cost			Mean	Consensus	MLS*C
Interests	4	2	3	3,00	0,799	2,40
Co-Investments	3	1	2	2,00	0,799	1,60
Co-Investments	1	2	1	1,33	0,724	0,96