

Building together: Value Co-Creation for Entrepreneurial Firms

*The case for innovation intermediaries in
entrepreneurial ecosystems*

Chipo Nancy Ngongoni



MSc in Innovation & Entrepreneurship
Faculty of Mathematics & Natural Sciences

UNIVERSITETET I OSLO

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by

Chipo Nancy Ngongoni

Supervisor: Professor Tommy.H.Clausen, PhD

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Chipo Nancy Ngongoni

<http://www.duo.uio.no/>

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Abstract

Entrepreneurship has been linked with improved economic stability and the economic turnaround of countries. Enabling and creating environments that attract, spur and cultivate entrepreneurs is of paramount importance. Such environments are dubbed entrepreneurial ecosystems.

The purpose of this thesis is to examine how entrepreneurial firms use external actors to create value in their companies in an entrepreneurial ecosystem. Of particular importance is how an intermediary organisation can foster value co-creation. This is done by looking at a case study of the Oslo Cancer Cluster incubator in Norway. The incubator is situated in the middle of an oncology cluster which offers an intriguing arrangement. The thesis will examine the arrangement of the cluster, incubator and its actors. I will proceed to investigate the interaction between the firms and the incubator, through the lenses of open innovation. This will be done in order to ascertain the significance and role of the incubator as well as how the firms use external actors to build value and grow. Finally, I will ascertain and offer my insights and observations attained from the study in relation to entrepreneurial ecosystems.

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This thesis has been one of the most life changing, fulfilling and challenging things I have ever undertaken and I owe gratitude to a myriad of people.

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To my adopted family, Walter, Irene, Lukas and Leo, you have no idea how much the laughter and love you have brought in my life has invigorated and inspired me. With you I have laughed without fear of the future.

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1 Introduction

1.1 Purpose of the thesis

The environment plays a crucial role in entrepreneurship. This has been noted academically through the likes of cluster theory, regional innovation systems and agglomeration economics (Fang, 2015; Michael E. Porter & Linde, 1995). Such research streams have greatly enhanced understanding in the dynamics around entrepreneurial activities and regions. However, most of these theories seem to study the dynamics in entrepreneurial environments separately. Arguments have been put forward that the underlying forces and actors in regions of high entrepreneurial activity cannot be studied independently. Therefore at a regional level it is urged to view the entrepreneurial activity as an ecosystem and analyse the dynamics amongst all the actors inclusively (Autio & Thomas, 2014; Spigel, 2015a, 2015b; Spilling, 1996). This has spurred the popularity of entrepreneurial ecosystems.

Entrepreneurial ecosystems consists of the individuals, organisations and institutions apart from the entrepreneur that either inhibit or promote entrepreneurship (Isenberg, 2011). They constitute of two distinct parts; entrepreneurship where individuals exploit and explore opportunities as well as the ecosystem (community) of interdependent actors around the entrepreneurs (Cohen, 2006; Isenberg, 2011). Several mutations of successful ecosystems such as Silicon Valley have been replicated around the world by policy makers but have not resulted in the expected success. This is because ecosystem design cannot be a one size fits all. There is a need to understand and examine how ecosystems function in particular regions and of what benefit they are to entrepreneurs in order to create successful and mutually beneficial environments.

So leveraging from a biological perspective where the quality or survival of the product of an ecosystem is attributed to the environmental factors (whether they be water, soil nutrients, sunlight etc) the same concept is being applied to entrepreneurship to ensure a correct mix of factors that drive entrepreneurship and firm survival (Auerswald, 2014; Autio & Thomas, 2014; Cohen, 2006; Suresh & Ramraj, 2012).

A lot of research has been done to try and define the boundaries, structure and coordination of ecosystems (Autio & Thomas, 2014). Studies tend to just identify the elements of the ecosystem but lack analysis on the relational connections and evolution between these

elements (Motoyama & Watkins, 2014). Cultivation of entrepreneurship in a region requires an in-depth understanding of how, when and why different ecosystem actors interact with each other.

One such call was for further study on how value is created and delivered within an ecosystem (Autio & Thomas, 2014). In this study value is termed as all the actions that are performed aimed at increasing the worth of a firm¹ and value co-creation is defined as the process that allows various actors to create value through interaction and exchange of tangible and intangible resources. Understanding value creation dynamics within an ecosystem is crucial not only in the positioning of the ecosystem but also in the successful appropriation of the value that the ecosystems purport to entrepreneurs and regions (Autio & Thomas, 2014; Motoyama & Watkins, 2014). This is to give better reference for the basis of this value (is it tangible or intangible) and how much of this value is a result of co-production (Autio & Thomas, 2014). Not many studies look at how entrepreneurs create value through intermediaries in such an ecosystem.

1.2 Problem statement and research question

For my study, I will start off with the sentiment that entrepreneurial firms need to have substantial value created from the ecosystem to have a sustainable competitive advantage (Autio & Thomas, 2014; Motoyama & Watkins, 2014) and then investigate how incubators, as an intermediary, assist these entrepreneurial firms to create this value. Hence based on this understanding I will address the following overall research question:

How does an intermediary assist in the value creation process for start-ups in an entrepreneurial ecosystem?

As it is a bit broad of fundamental importance is to highlight

- *Is intermediation necessary in an entrepreneurial ecosystem?*
- *What intermediary role is of importance to the start-ups to promote value creation in an entrepreneurial ecosystem?*
- *What interaction processes aide in value creation amongst actors and the intermediary in an entrepreneurial ecosystem?*

¹ <http://www.businessdictionary.com/definition/value-creation.html#ixzz48vpoJAOD>

1.3 Importance of the research

Through a vast literature review, I have identified a lack of studies that address how value is created in an entrepreneurial ecosystem which is an open innovation environment. More precisely, how innovation intermediaries such as incubators assist in this co-creation process. This thesis aims to highlight the concerns of entrepreneurial firms when it comes to value co-creation in an ecosystem and how incubators can be more relevant to their process. The study starts from the perspective that collective value creation in an ecosystem is something that may not happen automatically but needs to be facilitated. Bailetti and Hudson (2009) reiterated that ‘ *Facilitation of co-creation projects needs to be improved continuously. Facilitation of co-creation projects can become a source of competitive advantage for the ecosystem's agents. Just enabling co-creation is not enough* ’ (Bailetti & Hudson, 2009).

I address this gap through an exploratory case study done in a Norwegian context. I hope my findings will offer a perspective on how start-ups achieve a competitive advantage through value co-creation in an ecosystem and add insight to the fields of ecosystems research and intermediation.

1.4 Thesis layout

The following section is an overview of the current entrepreneurial environment in Norway as a study background. This is followed by a literature review discourse defining the elements of entrepreneurial ecosystems, value co-creation processes in entrepreneurial ecosystems, innovation intermediation and the dynamics of business incubators as intermediaries. I will proceed to offer an explanation of the methods and tools used to answer the proposed question as well as selection of study participants. The thesis will conclude with presentation of the findings and a discussion of the results.

2 Study Background

The start-up environment in Norway is very dynamic. The government is a major supporter of entrepreneurial ecosystems as well as entrepreneurial firms .

The groundwork of investing in entrepreneurial firms is reflected in the national budget. In 2016, Norway allocated 150 MNOK² to support Innovation Norway and 100 MNOK to pre-seed funding with 50 MNOK pegged for companies that are situated in a technology transfer office or an incubator³. Such sound investments over the past years have seen Norway build a strong ecosystem with about 14 clusters⁴, over 91 incubator networks, hubs and co-working spaces (Archer, 2015)incubators as well as educational programs like the one I am undertaking.

The spur of these clusters and incubators have come under the pretext that environmental factors play a crucial role in entrepreneurship as echoed by research in entrepreneurial ecosystems, agglomeration economics and other literature. Norway has pushed forward a commendable number of initiatives. Some start-ups such as Startup Norway even become disseminators of information for would-be entrepreneurs.⁵

Though this is commendable, the real question has arisen of how relevant and beneficial are particularly the ecosystems and resources that the government is fostering for entrepreneurs (Dee, Gill, Lacher, Livesey, & Minshall, 2012; Tavoletti, 2013). This is due to a lot of questions being raised around the firm survival rates of start-ups that are involved in these initiatives.

A clear example is from organisations such as Innovation Norway and its strategic input in assisting entrepreneurs. The organisation noted that entrepreneurs highlighted challenges not only related to inadequate funding but also a lack of business expertise and market orientation (Innovation Norway, 2014). This has led to Innovation Norway changing their grants scheme to fund more early phase start-ups so that business concepts can be tested without a high level of risk, a direct form of value co-creation. The institute emphasised on four services which it pegged to stimulate collaboration and development of business communities which are

² MNOK is million Norwegian Kroner

³ <http://oslocancercluster.no/2015/10/07/state-budget-of-2016/>

⁴ <http://www.nceclusters.no/nce-klyngene/>

⁵ <http://startupnorway.com/oslo-startup-ecosystem/>

- strengthening of collaboration in Norwegian innovation clusters,
- fostering of business networking support for small and medium-sized businesses
- competence development through collaboration with tertiary institutions
- regional development guidance to local authorities and municipalities with a development or restructuring focus (Innovation Norway, 2014).

To improve the ecosystem, Innovation Norway launched three global services aimed at Norwegian born-global firms. Interestingly, all these services focus on business development and these are TINC (Tech Incubator in Singapore, Entrepreneurial marketing in New York and Business Bootcamp Norge where start-ups go to expert environments in London, Boston and Silicon valley (which all have relatively strong entrepreneurial ecosystems). As an overview of the work done in 2014, 35 cluster projects reported over 651 innovation projects with over 261 projects of these where the cluster enterprises collaborated internationally (Innovation Norway, 2014). Though it seems Innovation Norway is doing this alone, it must be noted clusters and incubators are manned by the Industrial Development Cooperation of Norway (SIVA) and The Norwegian Research council. So all these mentioned above are also a collaborative effort between these parties.

2.1 Relevance of study in the Norwegian context

Two very interesting statements made by Innovation Norway in their 2014 annual report are

There is no shortage of entrepreneurs in Norway. Many companies are formed every year, but most of them remain small and few succeed internationally. What is it that enables some of them to move forward? and

If Norwegian enterprises are to become more internationally competitive in the future, they must collaborate on innovation and business development. Clusters and networks are useful instruments for that purpose (Innovation Norway, 2014).

These statements show an underlying acknowledgement that entrepreneurial ecosystems are crucial to the development of the entrepreneur.

Additionally, to ensure relevance of my study, I used one of the basic rules of entrepreneurship which is to always ask the customer and understand their pain. I settled on a journalistic question which I posed via email to various experts ranging from incubator managers, entrepreneurship researchers as well as cluster managers. This was done at the same time I was going through literature. The question was: *What are the factors in the entrepreneurial ecosystem which influence people to start and succeed in the entrepreneurial journey?* Though this was a broad, what was interesting to note is how positive a response I garnered from experts of how timely and relevant such research is. I also managed to acquire various suggestions on what to investigate. An excerpt of one such response that stood out is below:

'One thing you could look at is what it takes and why Norwegian startups are struggling with growth and if that has to do with the ecosystem, why are so many startups moving to Silicon Valley? Is the ecosystem here to weak?' (Respondent from Innovation Norway)

This cemented that I was on the right direction.

3 Literature review

This chapter addresses two fundamental aspects. Identifying the external actors important to start-ups and reviewing suggested ways that the start-ups can benefit from these external actors. This is done by starting from the wholesome description of the entrepreneurial ecosystem, selecting an intermediary of the system (an incubator) and highlighting the usage of open services innovation in the value co-creation process in relation to start-ups.

3.1 Entrepreneurial ecosystems discourse

Innovation and entrepreneurship ecosystems research has several terms such as innovation ecosystems (Autio & Thomas, 2014), entrepreneurial ecosystems (Spigel, 2015a), start-up ecosystems (Motoyama & Watkins, 2014) and business ecosystems (Weber & Hine, 2015). I will be using the term entrepreneurial ecosystems (EES) in the thesis which primarily looks at entrepreneurship.

The entrepreneurial ecosystem (EES) concept was prominently outlined by Van de Ven and Garud(1993) when he put forward that entrepreneurship was not just about the individual entrepreneur but also comprised of interdependent actors within a geographic region who influence the group of actors and inevitably the economy as well. Though this might seem very obvious now, when he proposed it most entrepreneurship scholarship had been penned focussing on the traits of entrepreneurs in order to debunk myths such as "*entrepreneurs are born, not made*". Van de Ven and Garud (1993) identified the different components of an EES into three main groups by which are

- *Resource endowments* from research that builds the foundation for new and innovative discoveries , financing mechanisms and competent human resources
- *Institutional arrangements* which are governmental policies that either inhibit or facilitate the emergence of start-ups
- *Proprietary functions* that offer accessibility to markets, customers, innovation networks and technology such as incubators and technology parks
- *Institutional arrangements* through governmental regulations and institutional arrangements (Van de Ven & Garud, 1993)

Isenberg (2011) went on to identify distinct domains of these components of an EES depicted in Figure 1. He put forward that, "*the entrepreneurship ecosystem consists of a set of individual elements—such as leadership, culture, capital markets, and open-minded customers—that combine in complex way*" (Isenberg, 2011) . This complexity is what is of interest and importance.



Figure 1: Isenberg’s model of an entrepreneurship ecosystem: Source (Isenberg, 2011)

Isenberg proposed that entrepreneurs are likely to succeed if they are operating in an environment that has policies assisting and protecting entrepreneurs with access to human resources, capital and markets (Isenberg, 2011).

From the background outlined above there comes the question that what is so different about ecosystems research that hasn’t this been analysed before in other streams of management, strategy, innovation or entrepreneurship research. I will attempt to address that concern in the next section.

3.1.1 Attributes of Entrepreneurial Ecosystems:

Assessing regions or environments for entrepreneurial activity has been done in various forms such as agglomeration economics, innovation systems, networks and cluster literature. Distinguishing how entrepreneurial ecosystems are different and their value is not an easy task as the field is fragmented. It does exhibit characteristics that are identified in other streams of research and it has a fuzzy definition (Autio & Thomas, 2014; Stam, 2015).

Firstly looking at structural differences, an entrepreneurial ecosystem has been defined as ‘*a network of interconnected organizations, organized around a focal firm or a platform, and incorporating both production and use side participants, and focusing on the development of new value through innovation*’ (Autio & Thomas, 2014) whereas ‘*Clusters are geographic concentrations of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition*’ (M. E. Porter, 1998).

From these definitions, clustered firms or regional innovation systems gain their advantages from being co-located with firms that are in the same industry or their supply chain in order to meet a demand. However in an ecosystem the entrepreneurs/firms are more likely to share a core technology or are facing the same challenges than being in the same industry. So emphasis for entrepreneurs in an ecosystem is more on sharing knowledge and experience about the start-up process rather than focussing on a market or industry (Spigel, 2015b). The underlying element of ecosystems is thus not just a product but a set of coherent and inter-related technologies so an ecosystem can be viewed as an evolving community (Autio & Thomas, 2014).

Secondly, though other network constructs such as clusters and innovation systems also have a focal point, they are usually primarily focussed on the production and user side of their networks (Autio & Thomas, 2014; M. E. Porter, 1998). This is in contrast with ecosystems where there is explicit inclusion of players outside the focal point which the entrepreneurial firm is operating in. This encompasses both upstream and downstream actors (Autio & Thomas, 2014; Spigel, 2015b). The reason for this is that the ecosystem’s focus is on value creation via the best possible actor regardless of industry focus. Ecosystems are further different from value chain or supply constructs by the non-linear relationships between the actors. The ecosystem concept is much broader as supportive organisations from institutions, communities of organisations and individuals that impact the focal firm (customers and suppliers) interact across various industries (Autio & Thomas, 2014; Mason & Brown, 2014; Spigel, 2015b). Thus the benefits are more of skills and resources rather than industrial benefits which are crucial for resource constrained entrepreneurial firms.

In regional innovation systems or clusters, there tends to be defined boundaries. This can go further to have a defined structural arrangement and have someone in charge of the system⁶. This is a bit difficult to define for entrepreneurial ecosystems as the diversity of actors outside the traditional value chain distributors and suppliers makes boundaries difficult to define (Autio & Thomas, 2014). This brings in the notion that if no-one is fully in charge then how is the ecosystem managed or coordinated in order for value to be created. This has a risk of giving inertia in the ecosystem due to unaccountability. One suggestion is that value creation can be achieved through a managed mediation service (Autio & Thomas, 2014). This is an aspect I will later elaborate on through the use of incubators.

Though value co-creation is a recurring theme in innovation systems, ecosystems research goes further to focus on the appropriation of such value. This means that the focus is not only on the optimisation of current networks but also how they evolve towards new states (Autio & Thomas, 2014). That is the *ecosystem participants co-evolve capabilities around a shared set of technologies and cooperate and compete to support new products, satisfy customer needs, and eventually incorporate the next round of innovation* (Moore, 1993, 1996) referenced in (Autio & Thomas, 2014). That means the ecosystem offers an arrangement where collaboration occurs and firms are able to combine their individual products and offerings together creating value that no individual firm could have accomplished. This aspect of collaboration has been addressed through suggestions such as co-opetition. Adaptation and evolution is core to an ecosystem and actor relationships must be symbiotic and members must co-evolve with the system.

Additionally, Motoyama and Watkins (2014) highlighted how urban development theories such as the cluster theory and innovation studies do not primarily focus on entrepreneurship. Entrepreneurship was viewed more of a peripheral or external factor or a result which occurs in high or low rates at certain locations. The role of entrepreneurs in the creation of these environments seems to have been underplayed (Motoyama & Watkins, 2014). Cluster and innovation systems seem to focus on the interdependencies between the actors at a systemic level whilst entrepreneurial ecosystems primarily focus on start-ups and put them centre stage. Therefore innovation systems and regional studies offer a more “top-down” perspective whereas entrepreneurial ecosystems focus on a more “bottom-up” perspective (Mason & Brown, 2014; Spigel, 2015a).

⁶ <https://thegedi.org/managing-entrepreneurial-ecosystems/>

Ecosystems research acknowledges systemic factors, their interdependencies and their importance. The interest lies more into trying to understand how they promote start-ups, what their relevance is, and what the role of entrepreneurs is in this regard. This has led to relatively low analysis about the network, structure or composition of the local systems surrounding entrepreneurship. Thus from these differences it has been noted that research on ecosystems, particularly entrepreneurial ecosystems, is underdeveloped and undertheorised due to encompassing different perspectives of the geography of entrepreneurship and ignoring the emergence of communities that are sustainable (Motoyama & Watkins, 2014).

Studying ecosystems represents the glue that puts everything together as we not only look at the organisational constraints but also include the players themselves particularly entrepreneurs. So the next section now addresses how value is created in an EES.

3.1.2 Gaps in Entrepreneurial Ecosystems research:

Building from this base, ecosystems research has mainly focused on understanding the structure and dynamics of already existing ecosystems (Cohen, 2006; Isenberg, 2011; Rice, 2002; Suresh & Ramraj, 2012; Van de Ven & Garud, 1993) with attention on value co-creation and networks (Autio & Thomas, 2014) summarized in Table 1. The table is a derivation from the paper presented by Autio and Thomas (2014) where they were ascertaining the highlights and differences in entrepreneurial research.

Stream of ecosystems research	Research Focus	Example works
Structure of Ecosystems (boundaries, structures and dynamics)	Definition of ecosystems, main participants and symbiosis, results of a successful ecosystem, defining characteristics of ecosystems	Isenberg, 2011; Van de Ven & Garud, 1993; Kapoor (2010)
Ecosystem Behavioural Literature		
Value Creation and appropriation	Analyses of value creation processes, emphasis on non-linear, iterative and non-sequential processes	Normann & Ramirez (1993); Christensen & Rosenbloom (1995); Stabell & Fjeldstad (1998)
Network embeddedness	Structural and relational aspects of networks from ecosystem actor's perspective, introduction of social theory, trust and legitimacy at dyad level	Jarillo (1988); Anderson et al (1994); Gulati et al (2000); Afuah (2000)

Network management	Proactive management and coordination strategies of ecosystems e.g game strategies	Ritter et al (2004); Moller et al(2005); Moller & Svahn (2006)
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Table 1: Adopted from (Autio & Thomas, 2014) and edited by the author

Several mutations of successful entrepreneurial ecosystems such as Silicon Valley, Sao Paulo or Boston and have been replicated across the world by policy makers but most have been unsuccessful due to a number of reasons⁷. There seems to be a lack of consideration of the local and cultural factors in the regions (Isenberg, 2011; Spigel, 2015a, 2015b). Policymakers tend to import best practices from other thriving systems without factoring the local economic and cultural attributes. This comes from a tendency of research in entrepreneurial environments in the past having focussed primarily on individual, cultural, policy and economic elements without assessing the interdependencies between the elements that constitute these systems and how they aide to value creation for new ventures (Spigel, 2015b).

There has been limited work that actually examined how ecosystems develop and how they actually provide benefit to entrepreneurs (Adner & Kapoor, 2010; Spigel, 2015a, 2015b; Stam, 2015; L. Thomas, 2013). Spigel stated that focus should be on the internal attributes of the ecosystem adding that there is a clear distinction between the outcomes of successful ecosystems versus the internal processes and governance strategies that help in creating and sustaining it (Spigel, 2015b). It seems most studies focus on identifying the elements of the ecosystem but lack in showing any analysis of linkages and relations between these elements and actors (Motoyama & Watkins, 2014).

This is further exacerbated with lack of a proper defined management it comes to question how ecosystems can be viably arranged so as to address entrepreneurial firm constraints (Autio & Thomas, 2014; L. D. W. Thomas & Autio, 2014). This may mean that an innovation mediator is important in order to have any value created in the ecosystem. So in an entrepreneurial ecosystem constituting of actors (entrepreneurs, retailers, researchers consultants and policy makers) that contribute to the development, diffusion and utilization of new products and processes; it is essential to have innovation brokers/intermediaries such as incubators. As an innovation broker the incubator ideally takes part in tasks such as innovation process management, demand articulation and network formation to assist entrepreneurial firms (Autio & Thomas, 2014; Garbade, Fortuin, & Omta, 2012).

⁷ <http://startup-ecosystem.compass.co/ser2015/>

From this gap this is where I am aligning my thesis, how an intermediary can assist in the value creation process of an entrepreneurial firm in such a complex system.

3.2 Value Co-creation in Entrepreneurial Ecosystems

Value co-creation is described as “*spontaneous, collaborative and dialogical interactions*” (Nudurupati, Bhattacharya, Lascelles, & Caton, 2015). The process of value co-creation entails the collaborative partnership between people, systems, infrastructure and information (Nudurupati et al., 2015). In the process of co-creation, appropriate actions should be taken between suppliers and purchasers, such as locating the supplier’s facilities closer to the purchaser's operations as well as the understanding, monitoring, conditioning and servicing of sophisticated technology systems and their use to ensure speed and effectiveness of their response to purchaser's needs while minimising their costs (Alves, Fernandes, & Raposo, 2016; Nudurupati et al., 2015). It was first highlighted under the developmental stage of services and manufacturing where consumers were asked for information and feedback on a product whilst it was under construction. Other theories such as the famous stakeholder theory outlines value creation in a business as an integral part of how firms mediate with multiple stakeholders to co-create value (Nudurupati et al., 2015). Adner, (2006) rightly said “*Ecosystems allow firms to create value that no single firm could have created alone*” referenced in (Agogu , Ystr M, & Le Masson, 2013)

Addressing ecosystems, Nudurupati et al (2015) observed that value co-creation that is undertaken in a multi-stakeholder environment is significantly different from that in a conventionally isolated environment. The network of the ecosystem itself becomes a driver for making strategic collaborative decisions and driving innovative activities (Nudurupati et al., 2015).

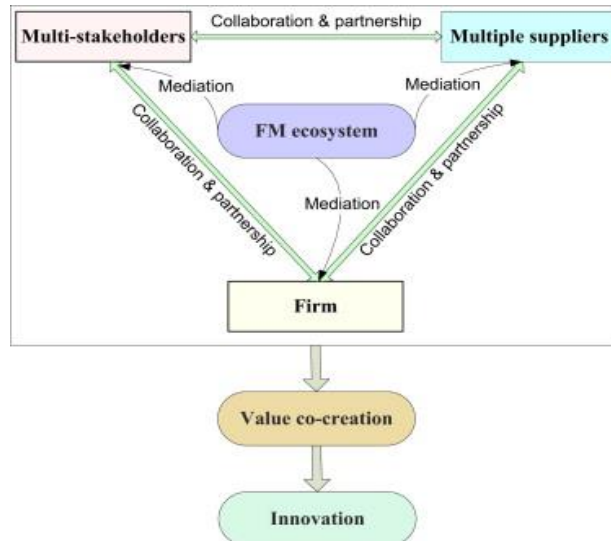


Figure 2: How value is created in an ecosystem (Nudurupati et al., 2015)

This process has been used in the past to just address the products and services produced by firms. In this thesis it has been translated to business incubators (producers) where they provide a service to the consumers (firms) besides just physical space (Smilor, 1987). Thus value co-creation has been pegged to be more pronounced when there is mutual awareness amongst the ecosystem actors that they are/will be engaged in collective value creation (L. D. W. Thomas & Autio, 2014). Thus it only makes sense to understand what the consumer (entrepreneurs) requires during the formulation of such environments primarily targeted for them, what is of paramount importance and what would spur collaboration and a stimulating environment.

In relation to value co-creation in an incubator, Rice (2002) focused on the dyadic relationship between incubator firms and the incubator manager highlighting how this aides in co-production of services for the firms. He gave a reference point for effective value co-creation or co-production from the services offered by the incubator. It can be done in three ways depicted in Figure 3:

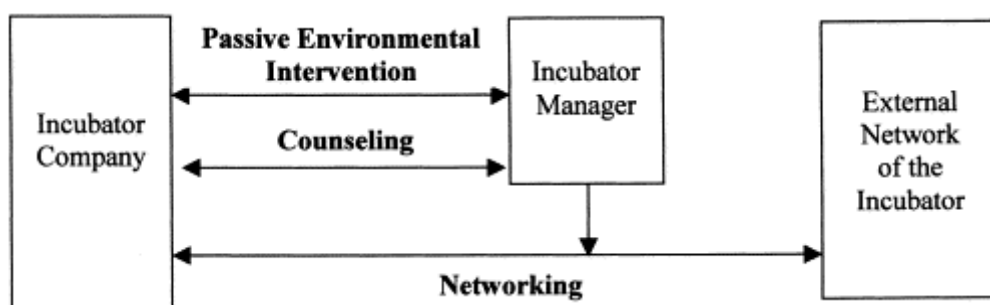


Figure 3: Value co-production processes (Rice, 2002)

- *Passive environmental intervention* which is the provision of shared resources, office space etc without any direct intervention from the incubator management.
- *Counselling* which is the providing knowledge and advice to entrepreneurs and
- *Networking* looks at provision of resource the entrepreneurs are lacking through the incubator's external network. (Rice, 2002). As can be seen in Figure 3, this integrates well with the proposition of incubators as innovation intermediaries and the roles that are of importance to firms.

By the incubator playing its role, it offers a platform of value co-creation whilst linking the entrepreneurs to the cluster and other external actors. More importantly, value co-creation is a process that does not occur on its own just by having a firm located in the incubator.

Knowledge access comes from interactions and discussion thus the positioning of firms and is of paramount importance (Archer, 2015; L. D. W. Thomas & Autio, 2014). The aim of co-production is in order to have a favourable output to the collaboration. Rice exemplified it well through an analogy of a university that even if the lecturers are excellent if students are not actively involved it does not produce a successful university (Rice, 2002).

Hence it is very important for a firm to be aware of how does this collective value creation take place and take part in purposive flows of information exchange.

3.2.1 Entrepreneurial firms and value co-creation processes

In describing entrepreneurial ecosystems I highlighted how understanding interactions between the actors is of importance. In an ecosystem there is continual exchange of interactions between actors and it is relevant to identify which types of interactions foster and promote value co-creation in an EES. This is why I have chosen to analyse the interactions in terms of the open innovation paradigm. This is done in order to offer clear recommendations on what types of interactions an intermediary should aim to foster in order to promote value-co-creation in the ecosystem.

The Open innovation model entails *“the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively”* (H. Chesbrough, Vanhaverbeke, & West, 2006). The model has been associated with the transmission and facilitation of complementary assets that enhance knowledge, expertise and resources across organizational boundaries. Successful integration of this model

in a firm has been purported to create complex, differentiated and inimitable capabilities that create a sustainable competitive advantage over time (H. Chesbrough et al., 2006; H. W. Chesbrough, 2005; Lichtenthaler, 2008).

So according to open innovation, an entrepreneurial firm can engage in the value co-creation process in an ecosystem in two fundamental ways outbound activities which see it selling or revealing its technology or inbound activities that entails the firm actively looking for technology or firms to collaborate with summarised in Table 2 (Dahlander & Gann, 2010). :

	Inbound innovation	Outbound innovation
Pecuniary	Acquiring	Selling
Non-pecuniary	Sourcing	Revealing

Table 2: Structure of our different forms of openness (Dahlander & Gann, 2010)

With incubators now transitioning from just co-working spaces to service providers, this makes the concept of open innovation more applicable. In order to co-create efficiently the incubators have to view themselves as a service and hence be able to treat incubatees in a different light in order to enhance their value (H. Chesbrough, 2011). Co-creation deals with a lot of tacit knowledge thus managing co-creation requires an effective way of managing and overcoming tacit knowledge as proposed by the open innovation process itself (Ritala & Tidström, 2014). The incubator has to figure out how to give a customised service which not only enhances the chances of firm survival bur also translates to profitability not only for the company but for the incubator itself in terms of success metrics such as exited firms, firm survival etc. Nevertheless this also creates a problem with standardisation since in every ecosystem the environmental constraints and nutrients are always different and require adaptation from both ways such as plants and their ecosystems (H. Chesbrough, 2011).

Other studies have looked at the formalization of open innovation policy through intermediaries in an incubator setting (Clausen & Rasmussen, 2011; Clausen, Rasmussen, & Rice, 2010). This served to identify characteristics of using intermediaries in open innovation policy and assist with the commercialisation of knowledge with regards to firms that may be suffering from any form of inertia.

In this thesis I choose to take this view and apply it to the scenario of the incubator and its incubatees. How the incubator as an intermediary offering a service gets to involve the incubatees in creating an environment that assists them, as well as encourage the firms to

open their boundaries and letting others assist in the co-creation process. Of particular interest is the notion that innovators co-create with customers. So in the next section I look at how incubators can be used as such intermediaries which foster value creation processes.

3.3 Innovation intermediaries

Intermediaries play a role and establishing and fostering knowledge flows to reduce uncertainty and asymmetries between industry actors (Polzin, von Flotow, & Klerkx, 2016). A failing ecosystem is characterised by a lack of a viable ‘bridge’ that links the small and large firms with a major challenge being how to bring all these actors in an ecosystem to reinforce and work together (Auerswald, 2014).

Howells (2006) defined an intermediary as *“An organization or body that acts an agent or broker in any aspect of the innovation process between two or more parties. Such intermediary activities include: helping to provide information about potential collaborators; brokering a transaction between two or more parties; acting as a mediator, or go-between, bodies or organizations that are already collaborating; and helping find advice, funding and support for the innovation outcomes of such collaborations”*. Intermediaries are gathering homogenous actors quite close to each other across the value chain as diffusion and technology agents (Agogu  et al., 2013). Intermediaries address a whole range of functions and bridging activities.

Howells (2006) proposed four main functions of intermediaries as

- Assistors in providing information on potential collaborators
 - Brokers or managing transactions between one or more parties
 - Acting as a mediator
 - Helping to find advice, funding or any other support for innovation activities
- (Howells, 2006).

Though these roles can be distinct in theory, in practice they tend to overlap.

Two prominent features of the environment where intermediaries are important are when there is unpredictability of any technological change, market organisations, user uptake as well a breakdown of linkages between potential users and suppliers that need to be created so that sustainable innovation can occur. Innovation intermediaries operate in highly unpredictable environments and whilst helping with interactions and collaboration they do not define or control use of the technology (Autio & Thomas, 2014; Stewart & Hyysalo, 2008).

A point of disparity though is the mention that mediation is important for system actors who either do not know each other previously or do not understand each other in a nascent market (Agogu e et al., 2013; Stewart & Hyysalo, 2008). That is not the case in this study as the oncology industry is very small and the players know each other but that does not deter the case of a need for mediation.

Digging deeper into mediation, Stewart and Hyysalo (2008) defined innovation intermediaries as actors who create spaces and opportunities for appropriation and generation of emerging technical or cultural products by others' (Stewart & Hyysalo, 2008). There is a level of complexity that is aligned with intermediation that is underestimated by practitioners and researchers due to involved players in the network. This has been attributed to either limited or no knowledge of the other players involved in the ecosystem. It is more pronounced from an entrepreneurial point of view where the firms do not publicise much (Stewart & Hyysalo, 2008). Thus in such uncertainty, intermediaries are crucial components in the network though their particular role is difficult to pinpoint and predict (Soetanto & Jack, 2013).

3.3.1 Intermediary Roles

Three distinct roles are played by innovation intermediaries and these are facilitation, configuring and brokering. These roles give a clear distinction of how the incubator can partake of the value co-creation process of the firms whilst interacting with the ecosystem as well. These roles are what this thesis will use as a reference point.

Facilitation relates to the provision of opportunities by '*providing opportunities to others, by educating, gathering and distributing resources, influencing regulations and setting local rules*' (Stewart & Hyysalo, 2008). It also integrates the creation of spaces of interaction for interested parties where skills and resources (tangible and intangible) are interchanged and acquired. It involves training, informal support and the creation of an atmosphere that encourages an interchange between users are important facets of the facilitation role (Stewart & Hyysalo, 2008).

Configuring is the creation of spaces which facilitate appropriation of ideas by others. Configuration does not only apply from a technical perspective but also pertains to symbolic interpretations of the incubated firms and their products. This blends in well with the notion of entrepreneurial ecosystems as highlighted above (Howells, 2006).

Brokering is when the intermediary represents and negotiates on behalf of the firm that they are assisting or new sponsors or investors interested in the entrepreneurial firms (Stewart & Hyysalo, 2008). I will be analysing these different aspects in the thesis. Brokering: act to raise support for the appropriation process by being a go between that fosters for and on behalf of users. In this case it is the incubator acting in a way such as to encourage sponsorship of the activities the companies currently undertake. A key characteristic of brokering is to bring actors into the ecosystem, maintain their commitment and interest and at the same time communicate the importance of any particular innovative process to their own business interests such as training (Howells, 2006)

Intermediaries are essential in cases involving a high degree of uncertainty and situations which often require a collaborative effort to solve the problem and intermediaries provide such platforms and connections (Agogu e et al., 2013). This is the case in the oncology industry and hence makes a study in that context relevant.

3.3.2 Gaps in intermediary research

Intermediations are no longer just bilateral alone; they take place in collective settings thus performing activities beyond just brokering and networking. Studies tend to focus on a straightforward triadic ‘one-to-one-to-one’ relationship thus the context of the relationships as well as the linkage networks of intermediaries are becoming important (Agogu e et al., 2013; Howells, 2006). This is very relevant in ecosystems as intermediaries are increasingly becoming involved in complex relationships, Agogu e et al (2013) reinforce that there is need to explore the roles intermediaries play when there is no single organisation that can achieve innovation by itself such as in ecosystems. Another aspect is the nature of the relationships that intermediaries are involved in such as network relationships (Howells, 2006). Research is quite scattered and lack of studies that offer a holistic approach but tend to be marginalised around organisations or processes (Agogu e et al., 2013). Thus looking at an ecosystem that encompasses both organisations and processes contributes to a holistic look at intermediary roles. By relooking at the intermediation processes this can support open innovation in collaborative settings and a business incubator is such an entity in the ecosystem.

3.4 Business Incubators as Innovation intermediaries

Incubators have been exemplified as a supportive environment for start-ups and fledgling companies that offer advantages such as a shared office space, support services, reduce

overhead costs and network provision (Bergek & Norrman, 2008). The relevance of incubation to start-ups and firm survival has come under scrutiny in the past few years. The scrutiny ranged from the quality of the types of incubators, success factors aligned with incubation as well as the generic offerings which do not address individual firm needs. Tavoletti (2013) went on to critique if incubators were a waste of public money as research evidence suggested that incubators tend to fail at their primary goal of supporting entrepreneurship (Tavoletti, 2013). Of note, Hackett and Dilts (2004) highlighted the misalignment of incubator and incubatee objectives which can inadvertently affect firm survival (Hackett & Dilts, 2004). All these concerns are important as there is a high level of financial investment, geographic re-planning and other innumerable resources involved in incubation setup and management.

Bergek and Norrman (2008) reiterated that there is a lack of theoretical base for incubator performance as well as incubator best practices and proposed a framework that assesses how and in what ways incubators provide support to entrepreneurs. Their model identified distinct components of business incubation. These are selection of occupants, infrastructure support, business support, mediation and graduation. In this thesis, the mediation role is of particular interest as it refers to *'how the incubator connects incubates to each other and to the outside world'* (Bergek & Norrman, 2008). Mediation relays the role of an incubator as a sort of bridge that leverages entrepreneurial talent and resources. According to Bergek and Norrman (2008) business incubators engage in mediation in two primary ways and these are network mediation or institutional mediation (Bergek & Norrman, 2008). Network mediation compensates for the incubatees' lack of established networks. The difference between this type of networking is that the incubator facilitates the networking for the incubated companies whilst helping the firms find amongst other things potential partners, customers, and employees.

There still is little known about the network needs and activities of firms that are in business incubators and understanding such networking activities is very important (Soetanto & Jack, 2013). So to assess the dynamics of the incubator and its role to entrepreneurs in the entrepreneurial ecosystem, I have chosen to focus on value co-creation processes. Autio and Thomas (2014) proposed that it would be of interest to understand the value creation dynamics ranging from how value is created and delivered, what facets does it represent

(service-based, manufactured goods or intangible assets) and the order of co-creation activities (L. D. W. Thomas & Autio, 2014) .

3.5 Summary of literature review and relevance to thesis

Entrepreneurial ecosystems engage all actors involved in creating value for entrepreneurs. It still is noted that most studies focuss on the structure of ecosystems and not really how they benefit or create value for entrepreneurs.

Thus looking at the interactive process by identifying how an element of the ecosystem, such as an intermediary, plays an important role in fostering interactions adds value to entrepreneurial ecosystem domain. (Mason & Brown, 2014; Spigel, 2015a; L. D. W. Thomas & Autio, 2014). Entrepreneurial firms are enticed to garner the services of incubators in order to create value and place them a step further due to the connections and network mediation that the incubator has been purported to offer. I have realised from literature that it is not exactly clear how the incubator aids in the value creation process (if at all). Just as Tavoletti (2013) propositioned that does business incubation offer that much value as has been publicised (Tavoletti, 2013). This is one aspect that this thesis will address.

Additionally, the interaction processes in the ecosystem need to be mapped can be mapped according to open innovation. Open innovation has mostly been aligned with established firms hence it would even make more sense to test the feasibility or existence of the model for start-ups which are on the lookout for complementary assets and much needed resources.

Furthermore, the view from the entrepreneurial firm is something that is also lacking but considered important as most studies have focused of structure or management of such ecosystems. So in order to fully integrate the concepts of collective value co-creation and open services innovation it is important to note how most businesses and industries have now tended to be more service oriented.

Therefore, the aim of this research is to explore how an entrepreneurial firm uses intermediaries such as an incubator to engage multiple stakeholders (both external and internal) and engage in collaboration and competition which enhance firm competitiveness and survival (value creation). The literature base is summarised in Figure 4 showing how the thesis is based on the different stream of research and their interconnectedness.

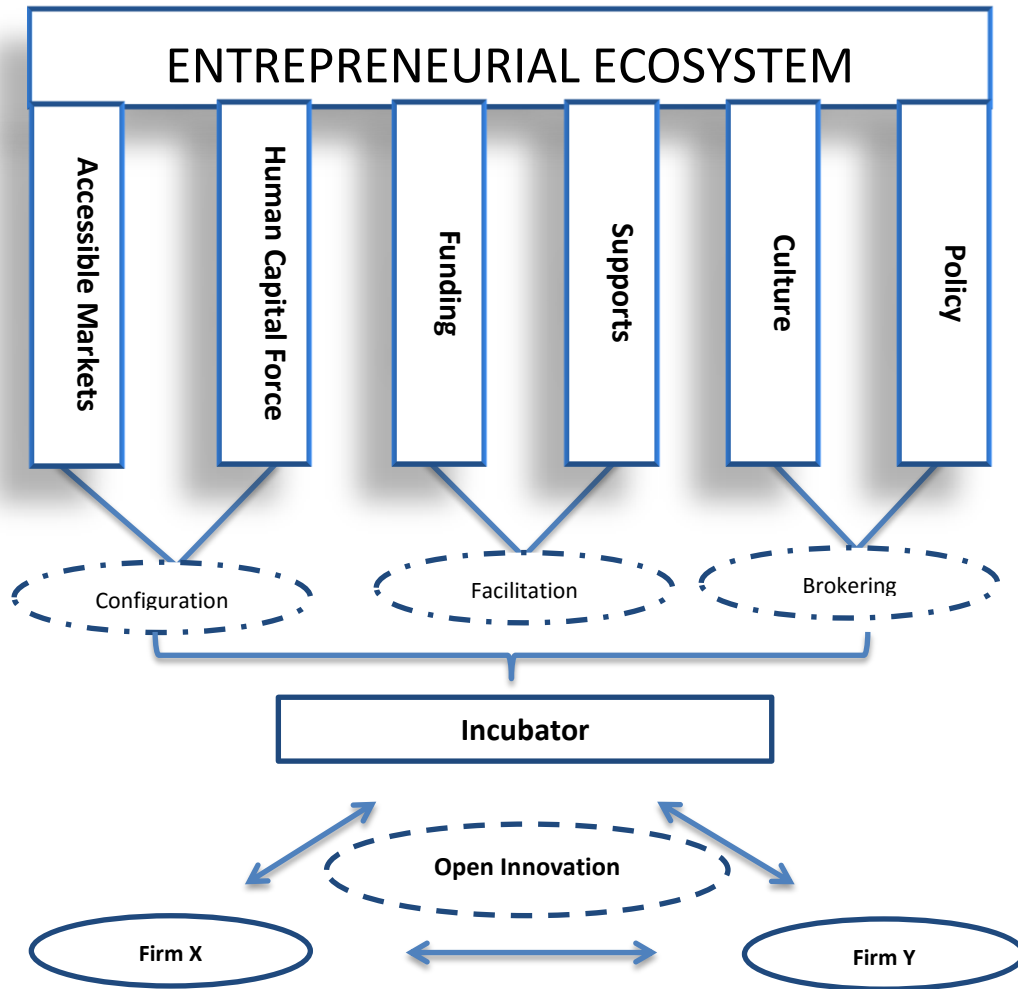


Figure 4: Shortened version of the literature map

I started off with a description of entrepreneurial ecosystems, the pillars of the ecosystem and the value it provides can be mediated by organisations such as incubators through the roles of facilitation, brokering and configuring. In the process of those interactions and actors open innovation can better explain the interaction dynamics and what is of importance for value co-creation.

4 Methodology

4.1 Research approach

This study was undertaken as a mix of both an exploratory and descriptive case study as the study had elements of both perspectives. Descriptive research leans towards describing an existing phenomena and exploratory research aims to develop better insight on the topic (Wilson, 2010). Hence when it comes to entrepreneurial ecosystems research, addressing the dynamics of how ecosystems work and how the firms partake in value creation process is still something that needs to be fully explored (Autio & Thomas, 2014; Gassmann, Enkel, & Chesbrough, 2010). The aim was to offer a holistic study on how value was being created by the incubator and in what ways (Yin, 2003). The case study offers a holistic approach tackling what is happening and why things are happening (Yin, 2003).

A qualitative approach was used in the case study to investigate the elements and factors that are important to the start-ups. Qualitative research is a noted interpretive approach that is used to explain a social phenomenon in a particular environment in order to examine data which is narrative in nature (Creswell, 2013; Wilson, 2010). This requires an understanding of the study from the perspective of the participants from the selected environment which is my aim for the entrepreneurial firms and the incubator (Wilson, 2010). This translated to me adopting the interpretivist approach where the researcher gets into the environment of the subjects under study whilst I was conducting the interviews (Wilson, 2010).

4.2 Ecosystem Selection

After ascertaining what I was investigating from an extensive literature review I had to select the study participants. I had to consider what encompasses an entrepreneurial ecosystem as referenced by (Isenberg, 2011) as well as identify an incubator linked to that ecosystem. So I started with incubator selection.

In Oslo there are a variety of incubators or entrepreneurial support organisations that I could have looked at. I was looking for an incubator that was situated in a defined ecosystem and directly acknowledged itself as being part of such an arrangement. This narrowed down my choices to Grunersgarajen (Simula Labs), Startup Lab and Oslo Cancer Cluster (OCC) incubator. These three incubators all had different dynamics. Simula Labs and the OCC incubator both formally belonged to a cluster whilst the Startup Lab didn't so this eliminated

the Startup Lab. Upon further enquiry I was informed by the Grunersgarajen manager that though the Simula Labs is listed as a member of the Oslo Medtech Cluster, it is not actively involved in the arrangement so this left me with the OCC Incubator. The OCC incubator had the interesting arrangement of being situated in the Oslo Cancer cluster. The cluster has over 70 members which cover the whole oncology value chain from both in Norway and Northern Europe⁸. The incubator works with mainly biotech companies whilst the cluster focusses on the whole value chain from university to market.

4.2.1 Oslo Cancer Cluster Incubator: arrangement

Oslo Cancer Cluster Incubator is part of the Oslo Cancer Cluster Innovation park which constitutes of Norwegian Cancer Registry, The Norwegian Radium Hospital Research foundation, Sykehusapotekene, Ullern videragående skole, Oslo University Hospital, ICGI Institute for Cancer Genetics and Informatics . This incubator is associated with organisations that have been involved in oncology research for the past 80 years and have an extensive patient and research database⁹. Oslo Cancer Cluster Incubator is situated on the 3th, 4th & 5th floor above the Ullern videragående skole. This gives easier access to upcoming generations and exposes them to the work that cluster undertakes. A number of entrepreneurial initiatives have been undertaken to pique the interest of the youngsters¹⁰. The aim of the incubator is to offer¹¹:

- Flexible office and (tailored)lab space
- Plug and play
- Publicly funded incubator-services
- Global investor network
- Global pharma network
- One to one guiding & competence building
- Business development
- IP and regulatory insights
- Trainings seminars
- Co-localization

What makes this incubator intriguing is that currently its tenants are mainly comprised of firms that offer services to start-ups. So the start-ups are a minority in the incubator. One important thing to note is all incubator members are cluster members too. This case was selected as an extreme case due to its unique qualities (Eisenhardt, 1989; Yin, 2003).

⁸ <http://oslocancercluster.no/a-dedicated-oncology-cluster/>

⁹ Interview results from management-refer to results section

¹⁰ <http://occincubator.com/events/event/apen-dag-ullern-videregaende-skole-5/>

¹¹ <http://occincubator.com/oncology-incubator/>

4.3 Data reliability

To ensure concerns about consistency in the data the following best practices were addressed to improve data reliability:

Multiple sources of evidence: in order to obtain a well-rounded view, I needed to interview incubator/cluster management as well as founders/ CEOs of entrepreneurial firms. The entrepreneurial firms were a mix of some residing in the incubator and out of the incubator. Along the course of assessing the occupants of the incubator as well as those who were willing to partake in the study, I managed to also get a response from an investor firm in the incubator and an entrepreneurial firm looking to enter the incubator. This approach offered two different perspectives. Firstly from management to understand what they pertain and perceive to be their role in the value creation processes of entrepreneurial firms as well as to understand what they have observed in the ecosystem. Secondly from the entrepreneurial firms, what they were actually getting from the incubator, how they interacted and how value was created. This was in hope of formulating the view on the intermediary role of incubators in the value creation process from various perspectives (Wilson, 2010). The unit of analysis was entrepreneurial firms (Yin, 2003).

Chain of evidence: all interviews were recorded with the interviewees' permission.

A case study database: once the interviews were completed, they were transcribed into a database to be later coded and analysed.

4.4 Data validity

In order to ensure that my study was valid my research question was in a continual process of reassessment. This reassessment is to ensure that I collect data which is relevant for what I have proposed as a gap that needs further investigation. Through an arduous process the research question eventually evolved to *How does an intermediary assist in the value creation process for start-ups in an entrepreneurial ecosystem?*

The semi-structured interview guides served as a guideline for data collection as well as supplemental data collection methods to ensure triangulation. The interview guides was constructed from the literature review and had thematic questions with an emphasis on how exactly the incubator has assisted the firms, trying to understand what role is prominent as an

intermediary from the incubator (Stewart & Hyysalo, 2008) . As well as how the entrepreneurial firms interact with the ecosystem.

Multiple perspectives: I interviewed multiple informants with different capacities in the ecosystem to shed light on the co-creation processes as well as the importance of the incubator in such a system. This adds a dimension of data validity.

Generalisation: By selecting the Oslo Cancer Cluster incubator that has marginalised the study to the Norwegian context with a focus on the Oncology industry. This has made the study particular to a certain ecosystem, thus it cannot have representational or population generalisation (Yin, 2003). However in terms of theory generalisation I believe that there is room to build from the results of the study as there are few studies that do look at the facilitation of value co-creation in an entrepreneurial ecosystem encompassing intermediation.

Skewness: Some companies that I contacted either declined or did not have time to be interviewed so this minimised my study participants. I also had to go through the incubator manager in order to access the entrepreneurial firms. Though I eventually contacted them directly there is still a level of risk aligned with instrumentation (Wilson, 2010).

Approach: An alternative approach would have been selecting different entrepreneurial firms from other incubators. The approach would have made it a bit difficult to assess the dynamics of the entrepreneurial firms from such diverse range of ecosystems and actors aligned with the value creation process of each of the entrepreneurial firms. Of course this in a way goes against the point that industry focus is not significant in entrepreneurial ecosystems but given the time factor for this project as well as a need to map the ecosystem, doing a cross industry study would have been time consuming. The Oslo Cancer Cluster incubator is unique in its arrangement , thus a single case study is sufficient (Wilson, 2010; Yin, 2003)

4.5 Data collection process

Primary data was collected through the use of semi-structured interviews from the developed interview guides. The interviews provided an ability to engage in both verbal and non-verbal communication as well as record the information for accuracy. It also enabled me to be able to ask follow-up questions in order to get examples of how the ecosystem was arranged and the dynamics of the interaction (Wilson, 2010). However setting up these interviews took quite a

while due to both me trying to get a solid literature base as well as the hectic schedules of the interviewees especially considering that biotech companies are entailed with lots of travel.

In total, nine face to face interviews were conducted subdivided into incubator companies, cluster companies outside the incubator; incubator and cluster management. This offers a dyadic view of the incubator role and ecosystem.

I managed to also get a written response from a firm which was considering joining the incubator and acquiring the perception of how the firm views the value of being in the incubator in relation to the ecosystem.

In addition to the interviews, I had a tour around the incubator space which educated me on the incubator layout and arrangement. I also had a chance to observe the occupants and collected documentation that was relevant to understanding the ecosystem and the incubator to ensure data triangulation (Wilson, 2010) . Validity of the case study is increased with multiple sources of data (Yin, 2003).

The following is the demographic of the study participants from the ecosystem:

Interviewee	Status
Entrepreneurial Firm 1	Inside Incubator
Entrepreneurial Firm 2	Inside Incubator
Entrepreneurial Firm 3	Inside Incubator
Entrepreneurial Firm 4	Outside incubator
Entrepreneurial Firm 5	Outside incubator
Entrepreneurial Firm 6	Considering incubation
Investor Firm	Inside Incubator
Incubator manager	Inside Incubator-focuses on incubator engages with cluster
Cluster Manager	Inside Incubator-focuses on cluster engages with incubator
Head of Marketing	Inside Incubator-works with both cluster and incubator

Table 3: Study participants

Data quality: Acquiring the perspectives of the start-ups, incubator management and cluster management was very important. It served to offer a well-rounded view of the dynamics about the incubator ecosystem intermediation and interaction processes. This adhered to the best practices suggested by (Wilson, 2010; Yin, 2003).

4.5.1 Anonymity and Identifiability

Though all the interviewees did not mind being exposed, as a researcher I have taken the liberty to present them anonymously in order to offer a high level of reflection from the interviews. The anonymity is more inclined to the entrepreneurial companies and not to management. This is because management expressed an interest in understanding how current services can be improved and what services are lacking for the entrepreneurs in order to aid in their value.

4.5.2 Data analysis preparation

Before undertaking any analysis, the interviews were transcribed. I personally transcribed the interviews. I found the process to aid in my recollection as well as offer themes for analysis as I noted similarities and concerns from the respondents. I highlighted themes in the interviews using different colour codes linked to the roles of an intermediary or the interaction process under open innovation. I mainly used priori coding but I was open for any other themes that may emerge out of the data as my mind was also exploring any other relevant themes that would emerge from the data (Wilson, 2010).

5 Results and Analysis

This chapter provides an overview of the raw data that was collected from the conducted interviews, observation as well as documentation. The aim is to understand the role of the incubator through the theoretical lens of what type of mediation role it plays (if at all) and to assess the interactions in the ecosystem through the eyes of how the incubator and entrepreneurial firm conducts its relations and interaction from the open innovation concept.

Using the interview guide as a point of reference, I categorised my data in these three categories and sub-categories:

Main Category	Sub-Categories
Role of the incubator <i>(Incubator and Value Creation)</i>	<ul style="list-style-type: none"> Type of services/assistance offered <i>(mediation role)</i> Interaction with the firms
Firm interaction <i>(Firm and Value Creation)</i>	<ul style="list-style-type: none"> Types of interactions undertaken by the firm <i>(open innovation context)</i> Observation of the entrepreneurial ecosystem actors
Value addition to firms and incubator	<ul style="list-style-type: none"> Value adds to firms Value adds to incubator/cluster

Table 4: Categories of interview guide

As a recap I interviewed 5 entrepreneurial firms, 1 investor firm, 3 people from cluster and incubation management and 1 entrepreneurial firm considering joining the incubator. I have decided to collate the results under the groupings of the interview candidates.

5.1 Interview results from Management

5.1.1 Role of the incubator

The management seems to view the incubator more in a facilitation role. This is exemplified by the cluster and incubator manager respectively stating that

The physical arrangement means a lot to these companies, you can organise a club or whatever, society, but if you don't have the clubhouse, and this is our clubhouse – Cluster manager

We are part of the tools in the toolbox to make this happen. – Incubator Manager

This perspective may be partly due to the age of the incubator. The incubator was conceptualised about 4 years back but the reality of the arrangement formally started in 2015. The companies are offered space and they basically connect themselves without too much effort the incubator manager. Some of the companies setup formal and informal get-togethers themselves with the assistance of incubator and cluster management. The incubator manager has a vision to tailor-make the space to biotech companies and hence seat relevant companies which has been the primary focus for the year that the incubator has been functioning.

There is also a lack of human resources as the incubator manager is currently the only fulltime employee that is fully dedicated to the running of the incubator. He does get assistance from the cluster management as some employees from cluster management get hours to assist him with various tasks.

Of note is how the incubator tries to foster collaboration through getting service providers at discounted prices. An example is how Innovayt, an innovation consultancy, assists companies with EU program calls and links the incubated companies with the right calls and expertise. This shortens an otherwise time consuming process. The incubator pays for the screening service but the start-ups then pay if they are to follow through with the suggested proposals. This is an example of a brokering role. Table 5 represents a summary of the results with a clear indication of the incubator mainly playing a facilitation role.

Intermediary Role	To Firms	To ecosystem
Configuration role	<ul style="list-style-type: none"> • offers follow-up activities • competence, • management, 	<ul style="list-style-type: none"> • part of national programs on cluster excellence • provides companies that are interested in international links
Facilitation role	<ul style="list-style-type: none"> • offices • meeting facilities, shared physical space • easier access to funding • labs, • special incubating seminars 	<ul style="list-style-type: none"> • access to cluster members • invitations to exhibit at international conferences • offers meeting space and interactions
Brokering role	<ul style="list-style-type: none"> • invest in service providers that assist companies • lobby for actors that aid start-ups • assists companies commercialise 	<ul style="list-style-type: none"> • provides links to certain themes and competences to cluster

Table 5: Management overview of incubator and value creation

5.1.2 Incubator and cluster interaction

The management seems to have a clear distinction between cluster and incubation roles. The incubator focuses on incubated firms and their commercialization process whilst the Oslo Cancer Cluster takes care of the drug development value chain network activities both nationally and globally.

The cluster provides funding, media coverage, human resources to the incubator e.g the sourcing of potential partners for incubator members is currently handled by the cluster international advisor, whilst any marketing and public relations issues are handled by the Head of communication of the cluster. Human resources can also aid as a way to foster value creation as they are aware of the needs of the different parties that they work for which is another way of marketing and advertising.

5.1.3 Firm interaction

Oncology is a big field competitors work together due to having niche technologies small oncology environment in Norway, a lot of the people in the incubator previously know each other or about each other from the industry so there is a high level of competence exchange. With cancer being a global phenomenon, it has a large addressable market hence this promotes collaboration. The companies usually have the exact same target group and same type of buyers sharing all kinds of information and same types of buyers.

On this basis the interactions amongst the firms that are aimed towards value creation from the perspective of management are summarised below:

	Inbound innovation	Outbound innovation
Pecuniary	Acquiring: <ul style="list-style-type: none"> merging of companies 	Selling: <ul style="list-style-type: none"> Licensing patent protected (not much activity)
Non-pecuniary	Sourcing: <ul style="list-style-type: none"> Informal networking Merging of industries e.g EU collaboration project combining IT and biotech industry 	Revealing: <ul style="list-style-type: none"> Company presentations combination therapies

Table 6: Management perspectives of firm and actor interaction in incubator

Non pecuniary activities for both outbound and inbound activities are prevalent amongst firms. These interactions seem to have been increased due to the closeness that is built by the

incubator. There has been a sentiment that companies are collaborating more because they are situated in the same place, the negotiation processes have been faster

‘my gut feeling is if you are here it’s easier to talk to the management I noticed PCI Biotech moved here like Christmas and I have much closer contact with them now and I help them more because they are here and I think it’s because they are situated here.’ –Head of communication

5.2 Interview results from Entrepreneurial Firms

Under firms there are incubator located firms and cluster firms situated outside the incubator. I combined the results for both the role the incubator played before and after the firms joined the incubator. Some were already well established firms in the growth phase whilst others were still starting. It does not take away how the incubator can and has assisted with (additional) value creation.

5.2.1 Role of the incubator

What is interesting is the older companies actually participated in the conceptualisation of the incubator by virtue of being cluster members and interacted during the conception of the concept. All the interviewed companies were asked to sit in incubator by management. Relationship between the incubator were previously established in 4 out of 5 of the entrepreneurial firms. All the firms had interacted with the cluster by virtue of being cluster members.

Intermediary Role	To Firms	To ecosystem
Configuration role	<ul style="list-style-type: none"> • access to legal team • access to funding • access to research base • discounted services from service providers e.g Patetnstyret, Innovayt 	<ul style="list-style-type: none"> • grant writers • easier access to data and publications which are expensive • access to other oncology companies
Facilitation role	<ul style="list-style-type: none"> • offices and facilities • allow companies to use facilities for free • closer to oncology focal companies • lab facilities • coffee station meeting area • make interaction easier due to same location 	<ul style="list-style-type: none"> • interactions with other cluster members
Brokering role	<ul style="list-style-type: none"> • assisted with contacts • built credibility to potential investors • build credibility with prospective employees 	<ul style="list-style-type: none"> • organise bio-conferences • networking and knowledge meetups • social football • partnering meetings

	<ul style="list-style-type: none"> • close to research base , technology and staff • company presentation from service providers • assistance to showcase company 	<ul style="list-style-type: none"> • contact with companies that fit company portfolio • offer marketing services
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Table 7: Incubator role from entrepreneurial firms

The incubator is highlighted as having formalised something that was very informal,

The OCC incubator formalised something informal; knew a lot of the people in the environment before but since we moved in geographically everything is a lot' - Entrepreneurial Firm 5

The facilitation role is what the incubator is mainly playing to the entrepreneurial firms

I don't think we would have labs- Entrepreneurial firm 4

But there has been identification of the need to now be more service centred.

5.2.2 Firm interaction

Collaboration and co-operation is rife due to niche technologies, a large addressable market and a wide networking base associated with the oncology industry. Close proximity to the research institute and clinicians which is important to 4 of the entrepreneurial firms I interviewed.

Most of the companies have the same partners, funders and owners due to the high level of risk aligned with the oncology industry. One such integral link is the Radium hospital. The interactions of the companies within the entrepreneurial ecosystem is summarised below:

	Inbound innovation	Outbound innovation
Pecuniary	Acquiring: <ul style="list-style-type: none"> • Joint venture activities • Spin-offs • Participation in collaborative calls • HR interchange 	Selling: <ul style="list-style-type: none"> • Licensing • Assistance with technological legal issues
Non-pecuniary	Sourcing: <ul style="list-style-type: none"> • informal networking e.g lunches • workshops with service providers • sourcing information from Technology Transfer offices, R&D 	Revealing: <ul style="list-style-type: none"> • CEO 5 minute pitches • company presentations • bio-conferences • combination therapies • participation in preferences for incubator environment • sharing laboratory

Table 8: Entrepreneurial firms' perspectives of firm and actor interaction in incubator

Of note all the companies except the incoming entrepreneurial firm are in different sorts of collaborations or discussing potential collaborations or mergers. It seems the environment fosters impromptu meetups or discussions as well as easier to arrange lunch discussions or meetings. Additionally the incubator members have access to cluster members due to the arrangement. As cluster members are around the entrepreneurial firms can access them.

5.2.3 Value addition

The most prominent value additions across all entrepreneurial firms about being part of the incubator and the cluster environment are diverse. Firstly, being part of the ecosystem has increased the credibility of the firms and attractiveness to either investors or potential employees.

It's a much easier sell when we are attracting staff when you are in such a dynamic environment as compare to some shoebox-Entrepreneurial firm 2

Secondly there is ease of access to potential collaborators and funders, data on clinical trials and research which are central to the entrepreneurial firms and would cost a fortune to acquire if they were not part of the ecosystem.

These are noticeably all intangible assets. What has been more surprising is how the environment has become viewed more like a family with the firms sharing the joys and the sorrows with the fellow companies. The entrepreneurial firms have the power to control policies or regulations that directly faces them. In this environment when one company faces an obstacle it affects the whole ecosystem, they can quickly discuss in the ecosystem and tackle it together. Companies have own agreements on collaborations. A summary from entrepreneurial firms view what is of importance to them in the incubator:

	Offices	Laboratory space	Human resources	Competence addition	Networking	Funding	Approached for collaboration	Seeks out collaboration	
Ent Firm 1	X	X	X	X	X	X	X	X	
Ent Firm 2	X		X	X	X	X	X	X	
Ent Firm 3	X		X	X	X	X	X	X	
Ent Firm 4	X		X	X	X	X	X	X	
Ent Firm 5	X	X	X	X	X	X	X	X	
Potential Incubatee	X		X	X	X	X			

Table 9: Summary of the types of resources that firms are getting from the incubator

The entrepreneurial firms highlighted some aspects from the incubator which would add a dimension of value creation from what is currently being offered.

Firstly, with regards to aesthetics, there was a call to make all floors of the incubator have the same format in the interaction and open spaces. Currently shared infrastructure is stuck on one floor so this in an indirect way affects the level of openness.

In terms of service provision, there is a call for the incubator to arrange more events around the entrepreneurial firms not service providers and organise meetings to share best practices and formalise a bit. Other firms were calling for a longer planning horizon to ensure interaction in the firm as these biotech companies are involved in a high level of travel hence requiring a higher level of proactiveness from the incubator and cluster as well as more feedback session such as focus groups. Firms outside the incubator do not interact link with the incubator as much.

5.3 Interview results from Investor firm located in incubator

This interview stemmed to highlight what is of importance to an investor of start-ups in such an ecosystem and what is the value of the ecosystem.

But I can say that we would have never invested in 'X' had it not been for them being part of the ecosystem and that enabled their development process and now they also work with.

As well as

Whats really interesting I have known some companies for a long time but never talked to the CFOs but now I am talking more to them

The investor firm gave interesting points on what they consider when deciding to invest in an enterprise which seems to emerge from being part of an ecosystem,

'one criteria that we are interested in for companies is how they are interlinked with academic institutions, it's really important to separate the academic and the business but it's also important to keep on being linked to academic institutions it helps the competence so that the company is not standalone and the institution had new knowledge which is important.'

5.4 Interview results from the Potential incubatee

From the potential incubatee I enquired why the firm was considering entering the incubator and what perception and expectation does this company have about OCC incubator. These were the response;

Knowledge of incubator: The company got to know about the OCC incubator through the Oslo Medtech cluster which easily aligned the competencies of the companies in the OCC ecosystem to the line of business of the company. So the company is looking to get in touch with similar successful firms; and have knowledge transfer within incubator network through the culture there.

Assistance from the incubator: The incubator actually worked with the firm by listening to their entrepreneurial pitch, suggesting modifications around the patent protection and informed the company about upcoming events aligned with the company e.g a pre-springboard with CONNECT Østlandet. This boosted the confidence the potential incubatee had in the environment.

Expectations: There is hope that a business developer will be acquired in the process, a boost from the OCC network and minimal rental charges

Value addition: Joining the incubator is a form of recognition for their scientific idea as well as generate a level of confidence to investors.

5.5 Data from Observations

The network for the cluster and incubator is growing through competence exchange, particularly CEOs from already established pharmaceutical industries in Sweden and Denmark. This brings in the perspective of the ecosystem aiming to be holistic at a regional level.

Arrangement: The floors of the incubator are a bit different in arrangement. The 3rd floor sitting area or coffee area is not conducive to sit and chat. However this seems to be something that management is aware of. The companies are in cubicles due to the nature of their business but that does not deter the interaction between the firms.

6 Discussion of findings:

With my study the aim is to contrast what the incubator management assesses and claims to provide the firm against what the entrepreneurial firms report as well as the perception of how the role of the incubator can be improved to better aide the value creation process of firms. The responses are very interconnected. As this is an exploratory study, there is no need to formulate propositions (Yin, 2003) but I summarised the findings so as to better discuss them.

So I have categorised the findings according to the sub question that they address.

Sub question 1: Is intermediation necessary in an entrepreneurial ecosystem?

Finding 1: *Innovation intermediaries (e.g business incubators) are necessary for the value creation for entrepreneurial firms in the ecosystem*

Though some studies on EES seem to suggest that just by being part of the ecosystem, value co-creation will automatically happen , this is not the case with this study. With it being the oncology industry which is highly specialized it is expected for interaction to be natural. This is due to the entrepreneurs and actors being people who have interacted before in various capacities. What is interesting is that it seems an incubator is the push factor to bring discussions and collaborations into fruition. Value co-creation has been deemed to be more likely in situations where there is an authoritative structure in this case the incubator offers that role (L. D. W. Thomas & Autio, 2014).

Finding 2: *Value creation for the entrepreneurial firms translates to value creation for incubator (intermediary) and the ecosystem*

The OCC incubator and cluster views the fruits of the relationships between the incubatees and cluster members as part of their success. The cluster and incubator tend to showcase these incubatees as examples of why it is important for public and private funders to invest in the ecosystem. The occupants in the incubator become part of the value proposition e.g investors that are in the incubator being referred to as access to funding for incubated firms. The incubator views the fruits of the relationships between the incubatees and part of its value proposition. In as much as the companies benefit, the cluster and incubator also benefits from the success of the companies as demonstrated in this quote

‘ it’s symbiotic (we need financing like now we are working with financing with Oslo Kommune and Innovasjon Norge it’s very important for us to show that the companies, that it is valuable for them to sit here. So we might need to showcase a company’ - Incubator manager

However, this may also negatively affect service providers as due to the ecosystem being strongly interconnected the entrepreneurial firms can choose to boycott the services of a provider due to information acquired during informal interactions. This can strong arm an institution into adhering with what the entrepreneurial firms view as important. Though this is good for entrepreneurial firms, it might deter service providers from being fully invested in the ecosystem.

Sub-question 2: *What intermediary role is of importance to the start-ups to promote value creation in an entrepreneurial ecosystem?*

Finding 3: *The entrepreneurial firm requires different mediation roles at different stages of growth from the business incubator for effective value co-creation*

The younger firms seemed to favour a facilitation role, looking at mainly the facilities, which assist with cutting costs and actually building credibility for the company. But once that is out of the way, the other mediation roles are also integrated into the mix, where the company now wants to grow, extend product line, secure other rounds of funding and employ more staff and build a culture (Spigel, 2015a). This requires a focus on the configuration and brokering role of the intermediary.

Finding 4: *Intermediary roles mutate according to the industry that the entrepreneurial firms and the ecosystem are aligned with*

Though it has been noted in the literature review that entrepreneurial ecosystems do not centre around an industry (Spigel, 2015a), this study seems to offer a different perspective. With oncology being a specialised field, it seems easier to collaborate and interact due to the individuals knowing each other in one way or another. The results did highlight collaborations outside the oncology industry but when it comes to value creation that is relevant to the ecosystem, it all seems focal on oncology.

Sub-question 3: *What interaction processes aide in value creation amongst actors in an entrepreneurial ecosystem?*

Finding 5: *Proactive incubators create more value for entrepreneurial firms in the entrepreneurial ecosystem*

In as much as the services speak for themselves and the entrepreneurs can foster their own value creation processes, it seems to be more heightened when an incubator is proactive. Currently, due to the OCC incubator being young, it has mainly focused on offering space but the incubator manager and stakeholders acknowledge that there is still more work to be done in terms of tailor making services. In this regard this is reflected to the incubated companies expressing their loyalty to the incubator and not considering other places as well as the cluster turning away companies. This shows that a level of trust has been developed and this is paramount to value co-creation (L. D. W. Thomas & Autio, 2014). Proactiveness is also currently shown through acquiring service providers a platform to connect with the entrepreneurial firms, though some firms were calling for the incubator to focus more on the firms and formalise their interactions and have best practices forums.

Finding 6: *Value co-creation is more likely to occur when companies are open to both inflows and outflows of knowledge*

In the value co-creation process the company has to be open to be approached for collaboration or look for opportunities. In the incubator, it is actually possible to have a collaborative effort without actively looking for it due to scenarios such as sharing the lab facilities. The awareness of the companies that they are trying to address a common target(cancer) and achieve results makes it easier for the entrepreneurial firms in the OCC to collaborate. This brings to mind what Spigel (2015) mentioned on entrepreneurial ecosystems being comprised of firms that are facing the same issues. Moreover, with some of the firms having technology which assists the other firms to deploy their drugs effectively, this give a complementary and additive nature to the ecosystem and this boost vale co-creation as well (Rice, 2002; L. D. W. Thomas & Autio, 2014).

6.1 Linkage to identified research gaps

6.1.1 Relevance to identified Entrepreneurial Ecosystems research gaps

A major research gap in entrepreneurial ecosystems research that I was aiming to address is the notion that research in entrepreneurial environments was segmented. There was a call to look at the interdependencies and holistic view of the actors in the ecosystem and how they actually assist the value creation process (Autio & Thomas, 2014; Spigel, 2015a, 2015b).

Findings 2, 4, 5 and 6 all highlight how interaction amongst the actors is important and how the interaction and interdependencies are expected to change over time. Even from a biological perspective, this is to be expected and a constant look at these interdependencies is of importance in order to build sustainable entrepreneurial ecosystems.

6.1.2 Relevance to identified Innovation intermediary research gaps

In intermediary research I identified that intermediations are no longer bilateral and intermediaries are now performing services beyond just brokering and networking hence the context of the relationships of the intermediation is important (Agogu e et al., 2013; Hallerstedte, 2013; Howells, 2006). I highlighted how this is of importance particularly in ecosystems research. Invariably, research on intermediaries is also marginalized around organisations and processes. So assessing such a role in the context of an EES adds a holistic dimension to intermediary roles and inform on how ecosystems actually provide benefit to entrepreneurs through intermediaries (Agogu e et al., 2013). Moreover, intermediaries offer a clear management structure to gel everything together thus it was necessary to even see if they were necessary at all. Findings 1, 2 and 3 address the mentioned gaps explicitly. This study has shown that an intermediary formalises an informal process which makes collaboration and co-creation much easier for entrepreneurial firms. Furthermore, the value of this co-creation is not one sided and hence the intermediary also benefits from this process. I also noticed that the relationship the incubator had with each of the entrepreneurs was unique and the incubator manager even highlighted that customization of services is something that the incubator is aiming for. This definitely shows that the relationships are no longer bilateral at all but quite complex.

7 Conclusions and Recommendations

The main purpose of this study was to investigate

How does an intermediary assist in the value creation process for start-ups in an entrepreneurial ecosystem?

To address this question a review on what is termed value to entrepreneurs and what means and resources are available for value creation in entrepreneurial ecosystems for entrepreneurs. The literature review embraced what is different about the entrepreneurial ecosystem concept, why it is important to understand the dynamics and how value can be created using intermediaries.

Six entrepreneurial firms, incubation management, cluster management and an investor firm which reside in the incubator were interviewed. The interview results were analysed to depict the various attributes and role the incubator can play to aide the value creation process of these entrepreneurial firm as well as the ecosystem.

I mapped out what intermediary role that the incubator plays in the value creation process. These roles range from brokering, configuration and facilitation of value creation processes shown in Tables 5 and 7. The form of interaction processes in the ecosystem promoting the value creation process shown Tables 6 and 8.

On top of the roles that have been highlighted it has been pointed out that it is important for the incubators to have their own resource base such as seed funding to assist the entrepreneurs. Also by having its own fund, the incubator is more aligned with service provision and not split trying to acquire fund to run the infrastructure of the incubator. The entrepreneurial firms themselves are always on the lookout for collaborators in the value creation process but they concur that being part of an ecosystem gives them credibility and builds confidence in investors which is of paramount importance to them.

Thus this study contributes in the knowledge of incubator's role as an intermediary and how they assist in the value creation process of entrepreneurial firms. It points out what is of importance to the entrepreneurial firms in order to create ecosystems that are of relevance to entrepreneurs. It also offers a number of theoretical implications.

7.1 Implications of the thesis

A number of studies have been undertaken that look at ecosystems but not really focus on the entrepreneurs or the facilitation of value co-creation. (Autio & Thomas, 2014; Stam, 2015). This study is a step towards addressing that gap. With a focus on entrepreneurs it highlights the dynamics of what is important for entrepreneurs how intermediaries can play significant and relevant roles as well.

7.1.1 Implications to Entrepreneurial ecosystems management

Entrepreneurial firms have expectations from the ecosystem that they are looking to join. It is important to understand the dynamics of the industry and assess what the competitive arrangement is like. Exemplifying the oncology industry that was the centre of this study, due to the large addressable market, intellectual property rights and need for collaboration to increase the speed to market, thus entrepreneurial firms are not wary about ideas or personnel being stolen. This makes the dynamic of this ecosystem more geared towards assisting each other and hence makes the job of management easier.

7.1.2 Implications to Intermediaries (Incubators)

Due to the dynamics mentioned above, the intermediary has to be sensitive to always assessing the ecosystem and being proactive about the needs of the entrepreneurial firms. An ecosystem is complex and dynamic and evolves over time (Auerswald, 2014; Spigel, 2015a, 2015b). It is important to continually interact with entrepreneurial firms in the incubator, ecosystem as well as prospective incubatees to see what would be of relevance to them in this space.

7.1.3 Implications to entrepreneurial firms

In order to gain fully from the ecosystem and create value for the firm, the firm has to have a culture that is open to collaboration and sharing information. In as much as these interactions start in a non-pecuniary manner they eventually translate to pecuniary benefits as resources are interchanged between firms as well as knowledge flows. Firms have to embrace the concept of affordable loss to ascertain the level of openness that they will choose to undertake and be open that interactions may not result in what is expected (Adner & Kapoor, 2010). The entrepreneurial firm has to realise that being part of the ecosystem requires two focuses, their core business and the ecosystem which might be taxing at time.

7.2 Limitations and implications for future research

Though the study has important significance, the results cannot be generalised due to the following reasons.

Sample size: The number of interviews was minimal due to the length of the study. It would be ideal if the respondents were more and the study longitudinal to really assess how the role of intermediaries changes in the life span of a start-up, whether it will still remain necessary at all.

Incubator type: This study focusses on a specialised incubator. This means all the firms are focused on one technological aspect or industry. I suspect that the dynamics of how the firms interact with each other would change in a more open incubator with firms participating in different industries where competition is rife for potential customers and the risk is slightly less due to less financial investment.

Regional and industry focus: Just as above, selecting a Norwegian context also shows a different perspective of that ecosystem and it is expected that different intermediary roles or important features will emerge if the study is undertaken in a different region. Studies done in other contexts, considering entrepreneurial ecosystems are particular to their regions other studies might give complimentary or different results.

Time constraints: undertaking such a study in a 17 week period made analysis and interpretation of data a bit rushed. Additional insights might have been achieved in a longer time frame.

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9 Appendices

9.1 Appendix 1 - Interview guides

9.1.1 Interview Guide for Firms in the Incubator

This study is to assess how the incubator has enabled firms to collaborate and create value with other firms inside and outside the cluster

Overview of Company:

How long have you been operational?

How long have you been part of the Oslo Cancer Cluster?

How long have you been with the Oslo Cancer Cluster incubator?

Incubator and Value Creation

How has the incubator assisted you and worked with you before you joined the incubator?

How has the incubator assisted you and worked with you after you joined the incubator?

What have they done to assist you? Please give examples

Of these services what have you observed as the most important for your firm?

Firms and Value creation

What activities (if any) does the incubator facilitate that promote your firm to interact with other firms in the incubator?

What activities (if any) does the incubator facilitate that promote your firm to interact with other firms / organizations outside the incubator but within the ecosystem?

What activities does the incubator facilitate that promote your firm to interact with other firms / organizations outside the ecosystem?

To what extent does the incubator promote this type of interaction? Please give examples

Is it mandatory to take part in such activities?

Are there any legal frameworks that protect you when sharing information with other firms?

Can you engage in your own external collaborations without including the incubator?

Cluster Interaction

Can you describe the relationship between the incubatees in the incubator? How do they interact etc? Does the incubator manager facilitate this? If so, how?

Can you describe the relationship between your firm and other non-incubated firms in the Oslo Cancer Cluster? How do they interact, learn from each other etc.

Does your firm participate in sharing ideas, resources, collaborating etc with other companies in the incubator and cluster? Please give examples

If not , why do you not take part?

Value added

Overall, how important has the incubator been to the development of your firm? Please give examples.

Overall, how important has the ecosystem been to the development of your firm? Please give examples.

Concluding remarks:

Are you a member of any other incubator or cluster?? If so, which one and what benefits do you find from being part of that incubator or cluster?

In your opinion:

Is there any additional aspect you see that the incubator/cluster can improve on to better assist the firms?

Is there any additional aspect you see that cluster can improve on to better assist the firms?

Is there anything that the incubator currently undertakes which is not of importance to the success or creation of value in the firms?

9.1.2 Interview Guide for Firms outside the Incubator

This study is to assess how firms collaborate and create value with other firms

Overview of Company:

How long have you been operational?

How long have you been part of the Oslo Cancer Cluster?

How long have you been part of the Oslo Cancer Cluster incubator?

Incubator and Value Creation

Has the incubator assisted you and worked with you before or after you joined the cluster?

What have they done to assist you? Please give examples

Of these services what have you observed as the most important for your firm?

Firms and Value creation

Do you interact with, collaborate, meet etc other entrepreneurs that are a part of the incubator? In what ways? Is this promoted by the incubator? If so, how?

Does the incubator help you to interact with other firms and organizations inside the ecosystem? Outside the ecosystem?

What activities does the incubator facilitate that promote your firm to interact with other firms in the cluster?

To what extent does the incubator promote this type of interaction? Please give examples

Are there any legal frameworks that protect you when sharing information with other firms?

Can you engage in your own external collaborations without including the incubator?

Cluster Interaction

Can you describe the relationship between incubated firms and other companies in the cluster?

How do they interact, learn from each other etc? Please give examples

Can you describe the relationship between your firm and other non-incubated firms in the Oslo Cancer Cluster? Interaction, learning from each other etc.

Does your firm participate in sharing ideas, resources, collaborating etc with other companies in the cluster? Please give examples

If not, why do you not take part?

How is the relationship with the cluster organization? To what extent has the cluster organization assisted you? What is the importance of this?

Why have you decided to not be a part of (or situated in) the incubator?

Concluding remarks:

Are you a member of any other cluster or incubator? If so, which one and what benefits do you find from being part of that incubator?

In your opinion:

Is there any additional aspect you see that the incubator/cluster can improve on to better assist the firms?

Is there any additional aspect you see that cluster can improve on to better assist the firms?

Is there anything that the incubator currently undertakes which is not of importance to the success or creation of value in the firms?

9.1.3 Interview guide for incubator manager:

The interview aims at identifying the most common business services to be provided by the Incubator.

Incubator overview:

How long has the incubator been functional?

How many companies(start-ups) have been assisted by the incubator?

How many firms are located in the incubator ?

How many are located outside the incubator?

Incubator and Value Creation

How does the incubator work to create value? For firms in the incubator? For Oslo cancer cluster? And for the Oslo area? Give examples!

What is the role of the incubator within the Oslo Cancer Cluster? Give examples!

How does the incubator work with firms in the incubator ? (services offered) Please give examples. Does the incubator work with non-incubated firms in the Oslo cancer cluster?

To what extent is the incubator firms connected to the other members in the Oslo cancer cluster? What is the role of the incubator in connecting the firms to the Oslo Cancer Cluster?

What have you observed as the most important services for the firms? Please give examples

What services are offered to firms that graduate/exit from the incubator

Firms and Value creation

Can you describe the relationship between the incubatees in the incubator? How do they interact etc?

Can you describe the relationship between the incubator firm and other non-incubated firms in the Oslo cancer Cluster? How do they interact, learn from each other etc.

What activities do you facilitate that promote firms to interact with each other in your incubator?

What activities do you facilitate that promote firms to interact with firms outside the incubator?

To what extent does the incubator promote this type of interaction?

Are there any legal frameworks that you have around firms sharing information?

Can companies engage their own external links outside of your knowledge?

Is there a difference in participation levels on firms allocated in the incubator compared to firms outside the incubator? Give examples

Cluster Interaction

Do you offer any services to firms that are outside the incubator? If so

Is there any difference between the needs (service requirements) of firms located in the incubator versus firms located outside the incubator but are a part of the cluster?

Is there any level of support that should be offered to the incubator from the cluster?

What is the relationship between the incubator and other types of cluster organizations within the Oslo cancer cluster?

Success factors:

What would you recommend as the success factors for the incubator? Key bottlenecks?

What additional services and interactions would you recommend to foster more interaction of firms in the cluster?

Concluding remarks

In your opinion:

Is there any additional aspect you see that the incubator/cluster can improve on to better assist the firms?

Is there any additional aspect you see that cluster can improve on to better assist the firms?

Is there anything that the incubator currently undertakes which is not of importance to the success or creation of value in the firms?

Can you nominate a few incubatees that I can interview? Ranging from age of firm, time in incubator etc

9.1.4 Interview guide for Head of communication:

The interview aims at identifying the most common business services to be provided by the Incubator.

Incubator overview:

How long has the incubator been functional?

How many companies(start-ups) have been assisted by the incubator?

How many firms are located in the incubator ?

How many are located outside the incubator?

Incubator and Value Creation

How does the incubator work to create value? For firms in the incubator? For Oslo cancer cluster? And for the Oslo area? Give examples!

What is the role of the incubator within the Oslo Cancer Cluster? Give examples!

How does the incubator work with firms in the incubator ? (services offered) Please give examples. Does the incubator work with non-incubated firms in the Oslo cancer cluster?

To what extent is the incubator firms connected to the other members in the Oslo cancer cluster? What is the role of the incubator in connecting the firms to the Oslo Cancer Cluster?

What have you observed as the most important services for the firms? Please give examples

What services are offered to firms that graduate/exit from the incubator

Firms and Value creation

Can you describe the relationship between the incubatees in the incubator? How do they interact etc?

Can you describe the relationship between the incubator firm and other non-incubated firms in the Oslo cancer Cluster? How do they interact, learn from each other etc.

What activities do you facilitate that promote firms to interact with each other in your incubator?

What activities do you facilitate that promote firms to interact with firms outside the incubator?

To what extent does the incubator promote this type of interaction?

Are there any policies that you have around firms sharing information?

Can companies engage their own external links outside of your knowledge?

Is there a difference in participation levels on firms allocated in the incubator compared to firms outside the incubator? Give examples

Cluster Interaction

Do you offer any services to firms that are outside the incubator? If so

Is there any difference between the needs (service requirements) of firms located in the incubator versus firms located outside the incubator but are a part of the cluster?

Is there any level of support that should be offered to the incubator from the cluster?

What is the relationship between the incubator and other types of cluster organizations within the Oslo cancer cluster?

Success factors:

What would you recommend as the success factors for the incubator? Key bottlenecks?

What would you recommend as the success factors for the cluster? Key bottlenecks?

What additional services and interactions would you recommend to foster more interaction of firms in the cluster?

Concluding remarks

In your opinion:

Is there any additional aspect you see that the incubator can improve on to better assist the firms?

Is there any additional aspect you see that cluster can improve on to better assist the firms?

Is there anything that the incubator currently undertakes which is not of importance to the success or creation of value in the firms?

9.1.5 Interview guide for Cluster manager:

The interview aims at identifying the most common business services provided by the Incubator through the cluster.

Incubator overview:

How long has the cluster been functional? How long has the incubator been functional?

How many companies (start-ups) have been assisted by the cluster and incubator?

How many firms are located in the incubator ?

How many are located outside the incubator?

Incubator and Value Creation

How does the incubator work to create value? For firms in the incubator? For Oslo cancer cluster? And for the Oslo area? Give examples!

What is the role of the incubator within the Oslo Cancer Cluster? Give examples!

How does the cluster work with firms in the incubator ? (services offered) Please give examples.

Does the incubator work with non-incubated firms in the Oslo cancer cluster?

To what extent is the incubator firms connected to the other members in the Oslo cancer cluster? What is the role of the incubator in connecting the firms to the Oslo Cancer Cluster?

What have you observed as the most important services for the firms? Please give examples

What services are offered to firms that graduate/exit from the incubator

Firms and Value creation

Can you describe the relationship between the cluster members and the firms in the incubator?
How do they interact etc?

Can you describe the relationship between the incubator firm and other non-incubated firms in the Oslo Cancer Cluster? How do they interact, learn from each other etc.

What activities do you facilitate that promote firms to interact with each other in your incubator?

What activities do you facilitate that promote firms to interact with firms outside the incubator?

To what extent does the incubator promote this type of interaction?

Are there any legal frameworks that you have around firms sharing information?

Can companies engage their own external links outside of your knowledge?

Is there a difference in participation levels in the cluster on firms allocated in the incubator compared to firms outside the incubator? Give examples

Cluster Interaction

Do you offer any services to firms that are outside the incubator? If so

Is there any difference between the needs (service requirements) of firms located in the incubator versus firms located outside the incubator but are a part of the cluster?

Is there any level of support that should be offered to the cluster from the incubator?

What is the relationship between the incubator and other types of cluster organizations within the Oslo cancer cluster?

Success factors:

What would you recommend as the success factors for the cluster? incubator? Key bottlenecks?

What additional services and interactions would you recommend to foster more interaction of firms in the cluster?

Concluding remarks

In your opinion:

Is there any additional aspect you see that the incubator/cluster can improve on to better assist the firms?

Is there any additional aspect you see that the cluster can improve on to better assist the firms?

Is there anything that the incubator currently undertakes which is not of importance to the success or creation of value in the firms?

Can you nominate a few incubatees that I can interview? Ranging from age of firm, time in incubator etc

9.1.6 Interview guide for Investor firm

This study is to assess how the incubator has enabled firms to collaborate and create value with other firms inside and outside the cluster

Overview:

Can you please give me an overview of your company, role and association with the incubator and cluster?

How long have you been part of the Oslo Cancer Cluster?

How long have you been with the Oslo Cancer Cluster incubator?

Incubator and Value Creation

What do you think is the role of the incubator within the Oslo Cancer Cluster (in the ecosystem)?

Please give examples!

How does the incubator work with firms in the incubator ? (services offered) Please give examples. Does the incubator work with non-incubated firms in the Oslo cancer cluster?

What do you think are the differences about being/not being in an incubator for incubator firms

To what extent is the incubator firms connected to the other members in the Oslo cancer cluster? What is the role of the incubator in connecting the firms to the Oslo Cancer Cluster

What activities does the incubator facilitate that promote your firm to interact with other firms in the incubator?

What activities does the incubator facilitate that promote your firm to interact with other firms outside the incubator?

Firms and Value creation

Can you describe the relationship between the incubatees in the incubator? How do they interact etc?

Are the entrepreneurs a part of the value chain of larger companies, other organizations in the ecosystem?

Can you describe the relationship between your firm and other incubated and non-incubated firms in the Oslo Cancer Cluster? How do they interact, learn from each other etc.

How does your organization works to help grow the entrepreneurs in the ecosystem. Please give examples.

How does your firm participate in sharing ideas, resources, collaborating etc with other companies in the incubator and cluster? Please give examples

In your view how does the ecosystem help grow entrepreneurs?

Concluding remarks

Are you a member of any other incubator? If so, which one and what benefits do you find from being part of that incubator?

In your opinion:

Is there any additional aspect you see that the incubator/cluster can improve on to better assist the firms?

Is there any additional aspect you see that cluster can improve on to better assist the firms?

Is there anything that the incubator currently undertakes which is not of importance to the success or creation of value in the firms?

9.1.7 Interview Guide for Firms considering in the Incubator

Overview of Company:

How long have you been operational?

How long have you been part of the Oslo Cancer Cluster? If you are not a member are you considering joining the cluster? If so why?

Why are you considering joining the Oslo Cancer Cluster Incubator?

Incubator and Value Creation

How did you get to know about the incubator?

Who initiated communication with the other, was it your firm or the incubator management?

Has the incubator assisted you and worked with you before you joined the incubator?

In what ways?

Is there any additional assistance that you were hoping the incubator would offer you?

Firm Interaction

Does your firm participate in sharing ideas, resources, collaborating etc with other companies in or out of the incubator and cluster? Please give examples

- If not, why do you not take part?

From your observation can you describe the relationship between the incubatees in the incubator? How do they interact etc? Does the incubator manager facilitate this? If so, how?

Value added

Overall, how important do you think the incubator will be to the development of your firm? Please give examples.

Concluding remarks:

Are you a member of any other incubator or cluster?? If so, which one and what benefits do you find from being part of that incubator or cluster?

In your opinion:

- Is there any additional aspect you see that the incubator/cluster can improve on to better assist the firms?
- Is there anything that the incubator currently undertakes which is not of importance to the success or creation of value in the firms?