Managing Innovation Networks

Exploring Coopetition Dynamics in Innovation Ecosystems

Vasili Mankevich
Abstract

Companies increasingly rely on external partners when starting their innovation initiatives. Emergent innovation ecosystems of heterogeneous actors proved to be successful in leveraging combined competence for the creation of the new ventures. However, constantly changing environment of simultaneous competition and cooperation – coopetition, presents a challenge for the ecosystem management. Drawing on the network orchestration and coopetition research, I analyze management practices and coopetition dynamics in the digital creative industry in Northern Sweden. Based on the analysis, I offer two main contributions. First, I provide a detailed account of innovation ecosystem orchestration within the digital creative industry, including its chronological evolution and the challenges related to it. Second, the application of coopetition notion to the innovation ecosystem context brings forward tensions that should be further scrutinized in order to develop better management practices for such innovation networks.

Keywords: Innovation ecosystem, coopetition, network orchestration

1. Introduction

In the world of increasing connectivity, specialization, and knowledge-dense products, it is evident that being part of a larger system becomes not merely a competitive advantage, but a necessity for participation in value creation (e.g. Selander et al. 2013). As a consequence, companies have shown interest in organizing themselves in the complex ecosystems that with adoption of network-centric strategy could combine their competencies in order to create products that would not exist otherwise (Adner, 2006) and compete with them on the global market (Nambisan & Sawhney, 2010). Innovation ecosystems leverage diversity and autonomy of its actors for potential innovative outcomes (Dhanaraj & Parkhe, 2006), which becomes the central focus of their activities. This new type of collaborative arrangements includes a wide range of diverse actors: partners, clients, suppliers, competitors, and public agencies. They are much like biological community interacting and depending on each other, evolving and responding to the environment in which they exist.

The emergence of innovation ecosystems however presents new challenges for practitioners. Hub firms – central companies that have a capacity to orchestrate value-added chains (Jarillio, 1988; Szarka, 1990), face conflicts inherent in the ecosystems. If the positions of the ecosystem actors are constantly changing, to which degree should the ecosystem members be integrated in order to establish an environment fruitful for innovation? A related issue is how firms can balance their own strategic interests and the ones of the ecosystem? To understand this phenomenon, there is an emerging literature that has adopted the notion of coopetition as a way of conceptualizing dynamic environments characterized by simultaneous collaboration and competition (Nalebuff & Brandenburger, 1996; Bengtsson & Kock, 2000). The dynamics of collaboration and competition in innovation networks are tightly coupled to issues relating to open vs. closed innovation practices. A starting point for the idea of openness in innovation practices is that a single
organization cannot innovate in isolation. It has to engage with different types of partners to acquire ideas and resources from the external environment to stay abreast of the competition (Chesbrough, 2003; Laursen and Salter, 2006). Clearly, the downsides of openness can also be considerable, although there is less focus on this in the literature. Openness can result in resources being made available for others to exploit, with intellectual property being difficult to protect and benefits from innovation difficult to appropriate.

Understanding these issues is important, since more knowledge about what drives innovation ecosystems would be highly valuable for managers and IT professionals confronted by the complexity of managing them. It will allow them to develop techniques that are responsive to change and diversity of the environment, and to develop strategies that will consciously employ balancing of coopetitive behavior.

Against that backdrop, this paper deals with the following research question: How are coopetition dynamics impacting governance practices of the hub firm in the innovation ecosystem? I address the research question using a case study research design (Yin, 2009), exploring digital creative industry innovation ecosystem in Northern Sweden. The remainder of the paper is organized as follows: firstly, I review literature on notions of innovation ecosystems and coopetition. Secondly, I describe qualitative research methodology that was used for the study, followed by an introduction of the theoretical framework that was implemented in the analysis. Next, I present the case description and the results from the analysis. Finally, I discuss empirical evidence of the innovation ecosystem orchestration, hub firm role dynamics and implications that coopetition notion has on innovation ecosystem management.

2. Coopetition dynamics in innovation ecosystems

2.1 Innovation ecosystems

The term ecosystem in relation to the business realm was first used by Moore (1993) in his seminal work on the ecology of competition. The ecological metaphor was used in order to describe the complexity and interconnectedness of the members, as well as an evolutionary approach to the development of the new type of collaborative arrangements. Further expanding on business ecosystems theory, innovation ecosystems are arrangements that provide opportunity for its members to combine individually produced value into products, establish new business ventures and achieve common goals that would benefit all its members (Adner 2006). It also stands on the principle of autonomy among the members, taking an advantage of heterogeneity and loose coupling, which increases potential of innovation output (Hansen, 1999).

In innovation ecosystems and related innovation network literature, extant research has focused on some key issues. Firstly, there are a large number of studies that explain the underlying processes that precede the formation of innovation ecosystems (Grover & Kohli, 2012). It is a contemporary business environment that for a start of new successful ventures requires a collective pull of resources and deems all individual attempts in that area deficient from the beginning (Van de Ven, 2005). Moreover, research of the digitally enabled generativity and layered structure of information technology manifested new organizing logic
that requires doubly distributed networks of highly heterogeneous actors (Yoo 2013; Yoo et al., 2010).

Secondly, Moore (1993) focused on the description of the phenomena and on its evolutionary stages and further research elaborated on this to build a taxonomy of ecosystems (Zahra & Nambisan, 2012; Nambisan & Sawhney, 2009; Iansiti & Levien, 2004). Consequently, with slight vocabulary differences three major roles within ecosystems emerged: (1) niche players / adapters – peripheral players who leverage unique competence within an ecosystem and to larger extent depend on the central players; (2) dominant firm / agents – firms that strive for hierarchical structure and control over ecosystem’s resources; (3) keystone / orchestra hub – position that focuses on value domination in asset sharing relationships. Notably, all of the roles are presented as a choice or a strategy, chosen by the firm that is planning to take on the position in the ecosystem.

Thirdly, some authors have devoted their attention to exploration of the management of innovation ecosystems (Dhanaraj & Parkhe, 2006; Nambisan & Sawhney, 2011; Levén et al., 2014; Dougherty & Dunne, 2011), with a number of works focused on innovation ecosystem governance from the perspectives of: risk assessment (Adner, 2006), conflict of interests (Selander et al. 2010; Nambisan & Baron, 2012), boundary resources (Ghazawneh & Henfridsson, 2010), and the role and contribution of non-focal actors (Selander et al., 2013). However, present research either portraits innovation ecosystems as static models, or prescribes one-fits-all strategies (that depend only on the role that is to be “chosen” by the firm). There is a void in extant research when it comes to developing managerial tools that would take in account the dynamics of innovation ecosystems development, how the roles of the focal and non-focal actors emerge, that would include such understudied issues as coopetition, political savviness, industry boundaries, measures of success (Walley, 2007; Van de Ven, 2005; Zahra & Nambisan, 2012; Selander et al., 2010 respectively).

2.2 Coopetition

Coopetition is a term that describes a state of simultaneous cooperation and competition (Nalebuff & Brandenburger, 1996). Concurrency of these two actions is a cornerstone of the phenomenon and serves as an indicator for its identification (Bengtsson & Kock, 2014). Also, researchers developed several views on how to categorize coopetition. Bengtsson et al. (2010) makes use of differentiation of coopetition as a context and coopetition as a process. Quintana-Garcia & Benavides-Velasco (2004) categorizes coopetition according to theoretical perspectives of: Transaction cost economics, Resource based view, and Game Theory.

Grounded in different theoretical perspectives, coopetition studies are directed towards the number of research streams. Firstly, the inter-organizational coopetition studies are focused of taxonomies of dyadic coopetition models (Nalebuff & Branderburger, 1996; Bengtsson & Kock, 2000, Luo, 2007). Secondly, the research stream founded in Tsai’s work (2002) is focused on intra-organizational and cross-functional coopetition, which explores competition for company’s resources for forcing innovative performance. Another branch of research focuses specifically on coopetition and knowledge transfer (Khana et al., 1988; Loebecke et al., 1999; Quintana-Garcia & Benavides-Velasco, 2004). Following the logic of
inter-organizational coopetition, however, present research stream analyzed knowledge sharing as a context of coopetition. Lastly, there is a notion in the coopetition literature of seeing coopetition as an example of constructive collusion: the state when companies are benefiting from the collaboration with each other (collusion) but are forced to compete, which benefits the end consumer (Walley, 2007; Thomason et al., 2013).

Some of the latest studies of coopetition have paid particular attention to the issues of trust between actors that are engaging in this kind of activity (e.g. Dagnino & Rocco, 2009). That means that in order for coopetitive activity to take place, all participants should have a firm belief that the value produced within the venture will be distributed fairly. Balancing the interests of the firm and the ecosystem is one of the central issues of ecosystems governance research (Nambisan & Baron, 2012) and is directly connected with the issues of innovation appropriability (Dhanaraj & Parkhe, 2006; Nambisan & Sawhney, 2011).

It is evident that coopetition research focused on its theoretical essence, definitions and taxonomies requires additional empirical evidence from the various industries. Bengtsson, Eriksson & Wincent (2010) in their work called for studies that could describe the contexts in which coopetition occurs. Similar call for empirical studies concluded the work done by Dahl (2014). Even though some notable examples of such studies are present (Ritala, 2012; Mariani, 2007) they, however, do not fully cover a diversity of an information technology industry.

By exploring innovation ecosystem, the main objective is to make two theoretical contributions. First, to develop understanding of how the hub firm’s position is emerging in the innovation collaborations, and which ecosystem governance methods are exercised during distinct development stages. Second, to identify the role that is played by coopetitive interaction and expand the body of literature with empirical evidence from the creative industry.

3. Methodology

The purpose of the study is to explore the dynamics of the hub firm involvement in innovation ecosystem development. In order to achieve that it was important to (1) understand the local business environment where the ecosystem had emerged, (2) collect information on the ecosystem development, (3) identify the members’ and the hub firm’s perception of the ecosystem and its activities. Such a study explores multiple contexts, discourses and nuances of investigated social phenomena, which made it a subject of qualitative case study research (Mason, 2002).

As the study aimed to describe not only the occurring events, but to the larger extent the perceptions of the actors it was chosen to use generated data. Generated data through retelling allowed me to capture interpretations and reflections of the phenomena that were observed by the actors (Ritchie & Lewis, 2013). Because of the context of the study naturally occurred data was rather limited and would not be sufficient for the conclusive results. Nevertheless, it worked as a supplement to the generated data and was used in order to validate a working hypothesis (triangulation).
### 3.1 Data collection

Primary data was collected from the digital creative innovation ecosystem in Umeå, Sweden. The innovation ecosystem was chosen for being actively developing entity in the Umeå region, playing an important role in the local creative industry. Individual interviews as a data generation method was chosen as the one that allows strong focus on the individual and provides better understanding of a delicate phenomena (Ritchie & Lewis, 2013). The first interaction with the hub firm was in the form of paired in-depth interview with the CEO of the hub firm (also chairman of the board in its initial stage) and with a hub firm employee who was responsible for the matters of the registered association and occupied the place of the chairman. During the interview information was gathered regarding hub firm experience of the development of the ecosystem, challenges and goals of its creation, and future plans.

The hub-firm provided the contacts of significant ecosystem actors (see table 1). Besides that in order to include public actor into the study, member of regional administration was interviewed. Participants were approached through an email with the description of the study, research question and invitation to participate in the interview. In order to follow certain key themes, yet leave room for a discussion, semi-structured interviews were conducted. During the interviewing process discussion topics were drawn from an interview guide (see appendix #1). Also, as a part of semi-structured interviewing process, follow-up and probing questions were asked when the need for clarification of further inquiry was present.

All interviews after participants’ verbal consent were recorded and lasted approximately 45 minutes each. Data collection was conducted over two research episodes: in December 2013 and in March 2014.

<table>
<thead>
<tr>
<th>Actor</th>
<th>Position</th>
<th>Sector</th>
<th>Identificator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hub firm</td>
<td>CEO</td>
<td>Digital production</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marketing assistant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partner firm 1</td>
<td>Business Developer</td>
<td>Consultancy</td>
<td>PF1BD</td>
</tr>
<tr>
<td>Partner firm 2</td>
<td>CEO</td>
<td>Consultancy</td>
<td>PF2CEO</td>
</tr>
<tr>
<td>Partner firm 3</td>
<td>CEO</td>
<td>Digital production</td>
<td>PF3CEO</td>
</tr>
<tr>
<td>Partner firm 4</td>
<td>CEO</td>
<td>Software</td>
<td>PF4CEO</td>
</tr>
<tr>
<td>Partner firm 5</td>
<td>Business Developer</td>
<td>Hardware and software</td>
<td>PF5BD</td>
</tr>
<tr>
<td>administration</td>
<td>Communication officer</td>
<td>Funding Agency</td>
<td>RA-CO</td>
</tr>
</tbody>
</table>

*Table 1: List of informants*

### 3.2 Data analysis

In order to analyze collected data, the qualitative data analysis logic proposed by Ian Dey (1993) was adopted for this work. As proposed by the framework, the analysis started from the examination of the focus of the study. The essence of grounded theory is to look for
theoretical discoveries in the data (Martin & Turner, 1986), however it does allow the researcher to draw attention points from the related research (Strauss & Corbin, 1990). In order to minimize the opportunities for error and conduct analysis efficiently, data management was carried out with the assistance of NVivo software, a platform for collection, organization and analysis of unstructured data. Next, reading and annotation process was carried out in order to process data and build up an initial understanding of it, for which purpose annotation was performed against themes drawn from the literature review. This allowed me to prepare the ground for deeper and thorough analysis of the data (Dey, 1993).

Coding as a central part of data analysis (Gillham, 2001) consisted of two inconsecutive steps: creation of codes (categories) and matching databits with corresponding codes. First, codes were created through a search of inferences in the data (open coding); second, relationships between open codes were identified (axial coding); and lastly core themes of the data were identified in selective codes (Strauss & Corbin, 1990). The databits were assigned to the categories in correspondence of how the context of the category manifests the context of databit (Dey, 1993).

Secondary documentary analysis was conducted in order to corroborate evidence and included media coverage, the hub-firm’s website, and the business network website. Also, documents regarding the network’s description and background; the network’s vision; milestones that were reached; goals and opportunities for the network members; a description of the board – were provided by the hub-firm. The documentary analysis allowed me to triangulate the data collected during the interviews and to validate categories for the primary data analysis. Further in an attempt to achieve a higher quality of analysis, when choosing between rival explanations the priority was given to those that would be simpler and logically consistent, rather then intricate in their nature.

After a number of iterations following previously mentioned qualitative data analysis model, sequential account of dynamics in innovation ecosystems was produced. It is certain that the biases of the author influenced interpretation of the events, however by being close to the primary and secondary data those effects were intended to be minimized.

3.3 Limitations
The context of the present study draws the limit to which its results can be applied and generalized. First limitation is associated with the sample choice: the case is based on the network that is operating in the digital production industry. Even though network participants are extremely heterogeneous, the conclusions of the study cannot be applied to the whole IT industry, let alone the entire business realm.

Second limitation is associated with the context of the studied sample: the research takes place in a region of Northern Sweden, that traditionally was occupied by capital-intensive industries and strong academic presence, with dramatic changes in the economic landscape taken place in the recent years. It is clear that this context could be related to numerous settings in OECD countries, yet it still limits the ability to extrapolate results of the study to the rest of the world.
4. Theoretical Framework

In order to structure and interpret obtained data the framework for Orchestration in Innovation Networks proposed by Dhanaraj & Parkhe (2006) was used in the present work, as it had been done in previous studies of innovation environments (Levén et al., 2014; Batterink et al., 2010). In doing so the aim was to use the focus points from the proposed framework for in-depth analysis of the hub firm governance practices and the formulation of the hypothesis (Ritchie & Lewis, 2012).

Dhanaraj & Parkhe (2006) draw up a framework that provides a description of the orchestration processes by the hub firm in the innovation networks (see figure 1). This type of innovation networks’ governance is characterized by focusing on the interactions of the autonomous loosely coupled entities that collaborate for value creation without strict hierarchical authority. This focus on interactions allows me to discover the underlying factors that influence positions that actors occupy in the network, their motivation and strategy and introduces the required vocabulary and attention points.

The framework portraits three main components of innovation networks orchestration: network design, orchestration process and the innovation output. While focusing on the orchestration process, the authors distant themselves from the other two components and articulate the significance of the process perspective in the network analysis.

The authors describe Network Design through three properties: (1) network membership category that includes network size and diversity of its members; (2) network structure defined by the density of relationships of the network members and autonomy of decision making from the other members and the hub firm; (3) network position of the hub firm described by its centrality and status among other members.

The first task of the Orchestration Process is to facilitate knowledge mobility between network members. With the deconstruction of the value chain, especially in the knowledge dense industries, the inter-organizational knowledge transfer becomes essential for innovation (Dhanaraj & Parkhe, 2006, Contractor & Lorange, 2002). The success of that transfer relies on the actors’ knowledge absorption capacity, which is how well they can comprehend the information flow. Further, common network identification is supposed to facilitate that flow and increase devotion of the members to information distribution. And the third element within enhancing knowledge mobility proposed by the framework authors is socialization, through formal and informal relationships developing relational capital (which potentially leads to innovative outcomes).

Managing innovation appropriability is the second task within the orchestration process that a hub firm needs to perform. In doing so it ensures fair value distribution (and perception of it) between the network members. The authors mention the importance of trust in unstructured networks and argue that innovation appropriability could be managed through procedural justice and joint asset ownership.

Issues of network stability are forming the third task of the orchestration process and are focused on securing “nonnegative growth rate” of the network (Dhanaraj & Parkhe, 2006: 661). These issues originate from the unique properties of the distributed networks, which are balancing between continuing integration into firm alliances and drifting apart in pursue of new opportunities. Orchestration framework firstly proposes to evaluate effort directed to
dynamic stability by assessing work on the network reputation. Second, perceived expected gains from the participation in the networks (or shadow of the future) are strategically important and therefore making an impact on network stability. And the degree of multiplexity – complex relationships with coinciding roles, could serve as a third factor influencing network stability.

As a result, orchestration framework provides an extensive account of the processes involved in the management of innovation networks. Further, presented framework formulates number of research propositions, which besides exploration of innovative outcomes take a closer look at the interaction of the elements of the framework, e.g. how innovation appropriability impact on knowledge mobility in the network.

5. Results

The results presented in this study concerns the ecosystem development period from 2008 to 2014, when the digital creative industry was actively developing in the region. It is certain that the industry existed before the timeline of this study, however this particular period was chosen for being an important step both in terms of the changing pace of the ecosystem development and the magnitude of the events that occurred. In what follows, these events are separated into three developmental stages in order to illustrate the chronological evolution of the ecosystem: Open Forum, Externalization and Fragmentation, during which hub firm’s role was radically changing with different orchestration processes being carried out (see table 2).

5.1 Open forum

The Open forum phase was initiated by the hub firm with initiative have been coming from
the hub firm’s CEO who further provided strong leadership for network development. At that stage the ecosystem was characterized by the individual level of relationships – the structure was loose and all connections were established based on individuals' professional networks. The actors of the ecosystem represented local firms engaging in the digital creative industry and represented approximately by 20 companies.

In order to improve knowledge mobility among ecosystem members informal socialization was a focus of the hub firm at this stage. Interaction between the firms took place in the form of the meetings and online mail list organized by the hub firm. Socialization was seen as a way for inspiration and acquiring new contacts within the ecosystem:

“So far it has been mainly a way of getting new contacts, getting to know which actors we have here in Umeå. [...] So far it has been more or less networking” [PF5BD]

As the ecosystem was at its emergent stage the main way for the hub firm to orchestrate innovation appropriability was to rely on trust and social contracts, which was the ecosystem’s attribute over the course of all developmental stages:

"It's really friendly atmosphere where you have parties together. If someone gets a bigger project they are not like “we want all money for ourselves”, they are taking other people in to do what they are best in. So everyone is trying to get their role in the big system”[PF3CEO]

Ecosystem stability at this stage was promoted by the hub firm’s reputation of market leadership, its capacity to interact with market players and with public actors in the region. Being a fast growing company with the CEO known for its creative acumen the hub firm established the foundation for persistent nonnegative growth of the innovation ecosystem:

"Biggest impact? From the start? I think it’s [Hub firm] actually. [...] But I think actually the main force behind that is [CEO] himself and [Hub firm]. He is really an engine, the creative engine”[PF1BD]

At this phase market research becomes the first coopetition instance in the ecosystem development process. It is characterized by the companies’ desire to map local heterogeneous market of creative industry companies (that often consists of micro-firms that hardly could be identified otherwise). The only way to achieve that was to participate in activities and therefore becoming themselves a subject of market research. The dual nature of these activities demonstrates coopetitive instance that is of an interest of this study.

5.2 Externalization

The externalization stage was characterized by the increased visibility of the innovation ecosystem and externalization of its activities. At this stage ecosystem expands to include university partner and public funding agencies, becoming even more complex interconnected
system. Academic partner was playing an important role providing an interaction platform for the ecosystem actors:

“I think from the autumn 2008 and maybe to autumn of 2010 very much was happening [in collaboration with academic partner]. […] It happened a lot during that time. It was seminars, it was workshops, it was speed dating” [PF2CEO]

At this point the members were engaging in coopetition at gaining the access to the academic research within ongoing partnership with the University. On one hand the opportunities for interaction with the research institutions became possible due to the joint effort of innovation network and its dialogue with pubic actors. On the other hand at the same time each of the members was pursuing own ambitions to commercialize the products of academic studies and establish relationships with researchers.

Innovation appropriability during the externalization phase was ensured through procedural justice, as interactions were formalized under official organization with the board as a managing party. It was a result of two separate intents: internal one from the hub firm and external from the public actors. Hub firm’s intentions were to guide digital creative industry development and to ensure own access to the value distributed by the public actors. Its highly dominant role allowed to exploit ecosystem’s resources:

“At the same time maybe [Hub firm] will get some critics, because [CEO] wanted to buy other businesses and take them in to his own” [PF2CEO]

The external intent of the publicly funded development project devoted to providing support to the local creative companies played a notable role in the decision to proceed with formalization of the network, as it was a condition that was required for official dialogue with public actors:

“[Formal registration of the network] is not that importing for networking I would say, but it is necessary if companies want to participate in the project and receive financing” [RA-CO]

One of the main issues during this stage of ecosystem development was to formulate common identity. The open nature of the network made it complicated to maintain network stability, its members represented diverse areas reflecting the ambiguous nature of the term “creative industry”. The definitions included but were not limited to: digital production, game development, software development, web development, multimedia production, video production, audio production, fashion industry, city planning, sustainable development. The challenge remained in latter phases with decreasing intensity as the network’s movement towards specialization:

“We made a choice that it is digital production industry. We had to make it clear for ourselves. […] [Regional administration] asked us to let other branches or
industries, sectors, to get into our association. Like fashion, or maybe music. But we made a choice that we need to be as clear as possible. So it is digital production businesses” [PF2CEO]

Hub firm became more explicit about the areas of its interest and shifted towards digital production industry terminology. This happened despite the pressure from the public actors to include a wider range of companies in the network and in doing so increase an impact on the regional economy. Also, the decision was conflicting with some firms’ interest in greater diversity among members, which would provide them with higher potential for innovation opportunities.

Unmet expectations of reciprocity were on of the main issues during the externalization phase. Some of the members accessed the returns from the activities as not comparable with the resources spent, which resulted in the decreased activity levels among the number of the members. This laid the foundation for the following fragmentation processes in the innovation ecosystem. In orchestrating the shadow of the future, the hub firm and the several actors had put an accent on increase their visibility to the policy makers and investors:

“I don’t have to be very active. The advantage that it exists that it’s going to be more buzz in the media about the industry. .... And then of course when I go out to find investors, then of course they say “oh, this business! You are one of the companies in that fantastic big businesses that I have read in the newspaper”” [PF4CEO]

Acting as an officially registered entity the hub firm communicated the needs of the industry to the local and regional administration and increased media exposure and visibility to investors. It resulted in the “Events strategy”, a policy adopted by the regional administration under which a series of events was organized in partnership with the division of the local university. However, by the end of the externalization phase large number of members deemed “events strategy” deficient, whether because of the limited opportunities provided by such a strategy or because of inability of that university division to deliver commercially applicable content. At that point it became obvious that number of actors in the ecosystem envisioned its development differently, placing an emphasis on business cooperation:

“We talked about it a lot, that we need to be more like [production network], more business related to each other. It's not one more seminar, or one more mingle evening that we need. We have talked about how to find the [business] case” [PF2CEO]

5.3 Fragmentation

The fragmentation process started from the point when the hub firm lowered its activity levels in the registered association and appointed new objective to establish production network of companies with which it would work in closer collaboration. From the dominant one the hub firm shifted the to keystone position, at which it is providing the vision for the
entire ecosystem, carrying out orchestrating activities that would ensure success for all its actors. This stage is characterized by larger involvement of different public developmental organizations, and lesser involvement of the University partners – this partly due to credibility loss after the externalization phase:

“In some way you can say that [university partner] was very important to get things happen the first two and a half years. And then the credibility for [it] decreased a little bit. Because they think that [university partner] is just academic and they don’t deal with business” [PF2CEO]

Knowledge mobility at this stage is ensured through enhancement of knowledge absorption capacity of its members: activities and events orchestrated by the hub firm became more specialized and directed towards certain segments of the digital creative production, such as game development or web development.

The focus of the ecosystem members was concentrated around two major cooperation areas: foundation of joint business ventures through the application of the expertise that could be found within ecosystem and the search for opportunities in the regional developmental projects. Focus on the commercial application of the ecosystem potential was a result of the frustration from academic activities of the externalization phase. The rhetoric at this stage takes the more pragmatic tone and directs towards finding a concrete business ventures, which results in multiplexity and joint assets ownership:

“Because those other networks exist anyway, between those who have more ideal [production network]. Some want to be top quality of everything. Them already make their own kind of networks. Even if they don’t have an organization name” [PF4CEO]

Search for opportunities in developmental projects with public actors becomes the major coopetition instance of the third phase. Firms apply for the funds from the public developmental organizations and their chances for success increase with the number of applicants and diverse expertise that they possess. At the same time the amount of funding is limited and therefore the applicants compete with each other for these incoming resources. Simultaneous cooperation and competition in this instance is the strategy that can be seen here allows innovation ecosystem members to apply for larger projects and avoid apportion of funds with other public actors and networks.

<table>
<thead>
<tr>
<th>Open forum</th>
<th>Externalization</th>
<th>Fragmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecosystem design</td>
<td>Hub firm and members (individuals)</td>
<td>Hub firm &amp; members (companies) University partner, industry development project</td>
</tr>
<tr>
<td>Hub firm position</td>
<td>Niche firm</td>
<td>Dominant firm</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Knowledge mobility</td>
<td>Socialization</td>
<td>Self identification</td>
</tr>
<tr>
<td>Innovation appropriability</td>
<td>Trust</td>
<td>Procedural justice</td>
</tr>
<tr>
<td>Ecosystem stability</td>
<td>Reputation</td>
<td>Shadow of the future</td>
</tr>
<tr>
<td>Coopetition instances</td>
<td>Market research</td>
<td>Access to the University's knowledge base</td>
</tr>
</tbody>
</table>

Table 2: Orchestration and development of the ecosystem

6. Discussion

This paper presents a case study of how the innovation ecosystem was orchestrated by the hub firm in the context of the digital creative industry. While the ecosystem continuously developed, the acquired picture of the social dynamics speaks for the complexity and interconnectedness of the processes involved in the orchestration of innovation environments.

Firstly, the study demonstrates an empirical application of the orchestration framework in innovation networks and responds to the call for systematic replication of case studies of the governance in innovation environments (Dhanaraj & Parkhe, 2006). Also, the findings of the study show that orchestration processes are not carried out simultaneously, but appear as a response to the environment in which actors function. For example, ecosystem stability was ensured sequentially through: market leadership reputation → increase of the shadow of the future → multiplexity. That means that in the orchestrating framework, particular processes will be more constructive and therefore preferential depending on the developmental stage of the network or ecosystem, which contrasts with the previous understanding that these tasks were performed simultaneously. For practitioners it means that by observing which orchestration processes are carried out by the hub firm, it will be possible to identify developmental stages of the ecosystem, its present and future challenges, and assist its development.

Secondly, in relation to the existing empirical research, this study confirms the results of Sölvell & Williams (2013) research on innovation environments, e.g. intentions of the actors to increase visibility of the members for public agencies and dissatisfaction and unmet expectations of the companies from participation in network activities. However, present
analysis shows that discontent appears as a part of the ecosystem development process and is overcome by further improving innovation appropriability and ecosystem stability. That speaks for the characteristic of innovation ecosystems in being sensitive self-regulating environment, given that its members act independently pursuing their own interests. Hub firms or public institutions that are engaged in the arrangement and development of innovation ecosystems should be aware of these challenges and how they are resolved in practice.

Figure 2: Role Dynamics in Innovation Ecosystem

Thirdly, the study shows how the position of the hub firm evolved in the innovation ecosystem as a response to internal and external factors (see figure 2). West et al. (2006) developed a research agenda for open innovation based on observations from industry practices firms adopt to rely upon external actors. However, if firms are to develop viable strategies for innovation management, more precision is needed in conceptualizing open innovation. Contributing to the innovation ecosystems literature (Iansiti & Levien, 2004; Moore, 1993), the description of the three hub firm’s position shifts reveal emergent intents in innovation strategy, that includes both desire to yield benefits of openness and minimize risks of competitive behavior. The first shift from the niche to dominant position was dictated by the strategic intent to tailor the ecosystem to its own strengths (Adner, 2006) and utilize its resources. Further, the second shift from the dominant to keystone/orchestrator position was a way to balance competitive conflicts and provide high level vision and strategic thinking for the entire ecosystem (Zahra & Nambisan, 2012). And lastly, public policies even though recognizing the existence of ecosystems do not identify particular roles played by different actors, formally shifting the hub firm back to the niche company position within the ecosystem. Coopetitive activities that were carried out present additional evidence to the theory of inherent coopetition within innovation ecosystems (Selander, et al. 2010), and also provides an account of the context fertile for coopetition, contributing to the understudied research stream of contextual preconditions for coopetitive behavior (Bengtsson, Eriksson, Wincent, 2010). Exploring extant research, a key question remains: Why are some firms profiting more than others from openness? This is a fundamental question on which there is surprisingly limited evidence in extant research. Researchers on open innovation have
suggested that it may be necessary to keep some aspects of the innovation process open while others remain closed (Laursen and Salter, 2006).

Addressing this question from the perspective of coopetition provides a valuable insight into balancing openness of innovation. The notion of simultaneous competition and cooperation reveals the kind of setting in which firms make decisions, and understanding of dynamics of this phenomenon (Bengtsson et al., 2010) equips researchers for further conceptual development of innovation theory. In that sense the study contributes to the existing research in terms of an application of the coopetition notion to the innovation ecosystems management and development. Further studies need to be undertaken before the relation between coopetition and innovation is more clearly understood.

7. Conclusions

The aim of this research was to study and analyze how are coopetition dynamics impacting management practices of the hub firm in the innovation ecosystem. The analysis makes several theoretical contributions. First, it extends understanding of the innovation network orchestration by applying in to the innovation ecosystem in the digital creative industry and provides a detailed chronological account of its development. Second, the study confirms and further elaborates the earlier research on network centric innovation in Northern Sweden. And lastly, by applying the coopetition notion to the innovation ecosystems the study emphasizes the central role that tensions between collaboration and competition play in the management practices of the hub firm. The study once again reveals the complexity that practitioners are facing in managing innovation ecosystems and further research that would build a better conceptual understanding of this phenomenon is needed.

8. Acknowledgments

I would like to express my gratitude to my supervisor, professor Jonny Holmström. Without his help and guidance this dissertation would not have been possible. I also would like to thank the Swedish Institute and its generous Visby Scholarship Programme for the provided support of my studies at Umeå University.
References


Appendix 1: Interview guide

**Interview topic guide**

1. **Regional landscape**
   a. Traditional industries in the region
   b. Knowledge-dense industries
   c. Role of public actors

2. **Creative industry and its products**
   a. Definition of the creative industry. Terminology
   b. Products and participants of the creative industry
   c. Challenges

3. **Resources**
   a. Value co-creation
   b. Collaboration within ecosystem
   c. Impact of the membership in the association on the firm

4. **Dynamics of the innovation ecosystem**
   a. Vision and rhetoric
   b. Leading roles in the ecosystem development
   c. Roles dynamics

5. **The Innovation ecosystem**
   a. Membership policies
   b. Quality assessment
   c. Leadership
   d. Working practices